Independent Schools Association of the Central States Accredited Private School Professional Teachers' Levels of Nomophobia

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Abstract

Nomophobia is "the fear of being unable to use one's mobile phone or being unreachable through one's mobile phone" (Yildirim & Correia, 2015, p. 1323). A sample of 161 professional teachers from accredited private schools in Kansas and Missouri was utilized to measure levels of nomophobia and differences based on teachers' gender, age group, and grade level taught. The survey data was collected using the Nomophobia Questionnaire (NMP-Q) created by Yildirim (2014). Independent-samples *t* tests and ANOVAs were used to address the four research questions. Results indicated that teachers are experiencing moderate to severe nomophobia. Additionally, female teachers' levels are higher than male teachers, teachers 18-35 have the highest level of all of the age groups, and teachers in early education and elementary schools experience higher levels of nomophobia. Further analysis regarding the four underlying factors of nomophobia revealed significant levels of nomophobia in the fear of being unable to communicate, the fear of losing connectedness, and the fear of being unable to access information. Female teachers reported significantly higher levels of nomophobia in the fear of losing connectedness, the fear of being unable to access information, and the fear of losing convenience. Also, teachers between the ages of 18 and 35 reported significantly higher levels of nomophobia in the fear of losing connectedness, the fear of being unable to access information, and the fear of losing convenience. Early childhood and elementary teachers reported significantly higher levels of nomophobia for all four subfactors. As one of the first to measure teachers' nomophobia, this study raises awareness of concerns within classrooms and the need to create well-informed policies and procedures emphasizing a healthy balance of technology usage at school.

Dedication

This dissertation is dedicated to the following five individuals:

First of all, to the one person without whom this dissertation would not exist, my husband: John E. Boyer. Without you, I would have never begun this final educational adventure. You inspire me every day with your thirst for knowledge and quest for deeper dives into whatever topic has piqued your interest at the moment. Thank you for believing in me, giving me the time, space, and support to continue down this path, and for encouraging me to keep putting one foot in front of the other.

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Chapter 1

Introduction

Each school day, millions of children enter classrooms all over the world. Teachers are the hub of these classroom environments. The curriculum directs teachers, who, in turn, direct students. Technology connected to the Internet is now commonly utilized by both teachers and students to access and enhance the curriculum (White & Martin, 2012). The appeal of the handheld devices that access this technology is housed in the unmatched power they possess, "promising to replace textbooks, desktop computers, and even paper and pen with a single device" (White & Martin, 2012, p. 23).

A cord no longer ties technology to bulky computers. Mobile technologies, specifically smartphones, connect to the Internet anywhere and anytime. Kim, Hwang, Zo, and Lee (2016) specified that smartphone users can access limitless information and utilize high-powered applications designed with augmented reality for entertainment purposes, educational settings, medical research, and robotics. Kim et al. (2016) stated one primary goal associated with smartphone software is to hold user interest as long as possible by entertaining and increasing the usefulness of the applications. One positive example is educational applications explicitly designed to keep students engaged, actively communicating, and learning online (Kim et al., 2016). However, Choliz (2012) warned users might stray down the dark path of problematic usage because mobile device software is also built to engage and hold user interest by providing entertainment and relationship connections through social media, digital identities, and virtual environments. Walsh, White, and Young (2008) identified three different sub-categories of problematic mobile phone usage. The first sub-category is dangerous phone usage, for

example, using a phone while driving. The second sub-category is inappropriate usage, for example, using a phone during a movie in a theater. The third sub-category is overuse, for example using a phone in lieu of sleep (Walsh et al., 2008). Choliz (2012) claimed that all three types of problematic mobile phone usage indicate smartphone addiction.

Kwon et al. (2013) stated, "Smartphone-related problems are too critical to be neglected" (Introduction section, para. 7). Symptoms of smartphone addiction include physical problems such as eye strain, headaches, injuries due to accidents while focused on the phone, and sleep issues. Social problems include the avoidance of face-to-face communication with others, loss of flexibility, and unwillingness to engage in social situations; emotional problems including psychological anxiety and depression, poor academic achievement, and withdrawal symptoms similar to drug addiction (Durak, 2019; Kim, 2013; Kwon et al., 2013). A relatively new phenomenon called nomophobia is one of these negative symptoms caused by smartphone addiction (Bragazzi & Del Puente, 2014).

Nomophobia was defined by Yildirim and Correia (2015) as "the fear of being unable to use one's mobile phone or being unreachable through one's mobile phone" (p. 1323). People who have experienced significant levels of nomophobia describe themselves as uncomfortable and very anxious when deprived of access to smartphones (King et al., 2013). Choliz (2012) linked problematic phone usage with smartphone addiction. Durak (2019) described the inappropriate use, dangerous use, and overuse of smartphones as having a "significant relationship with nomophobia . . . [and suggested] prevention activities must be prioritized when dealing with the intense and uncontrolled

usage of smartphones" (p. 492). Future research will most likely reveal if there are any ramifications of smartphone addiction and nomophobia not only for teachers, but also for classrooms and student learning.

This chapter begins with the background of the study on teachers' levels of nomophobia. The statement of the problem, the purpose of the study, and its significance follow. The delimitations and assumptions of the study are followed by the research questions and definitions of terms. The chapter concludes with an explanation of the organization of the study.

Background

This research study took place in private schools located in Kansas and Missouri and accredited by the Independent School Association of the Central States (ISACS). The teaching faculty of 12 private schools accredited by ISACS were invited to participate in the survey. According to the 2019 websites of all invited schools, the combined enrollment was 6,632 students ranging from pre-kindergarten through 12th grade; employed faculty of invited schools totaled 1,095. The schools' locations ranged from small rural and suburban towns to large cities. Specific criteria to participate in the current study required employed teachers to own a smartphone and have access to the Internet.

At the time of this research study, there was a wealth of research available on smartphone usage. Anderson (2015) found that 92% of Americans over the age of 18 owned a smartphone or cell phone. One of the most critical smartphone concerns relevant to this current research was brought to awareness by the Pew Research Center (2018): One in four Americans agreed that they were online almost constantly.

Measuring the attitudes and habits of children, teenagers, and adults worldwide in order to grasp the long-term implications of these devices small enough to fit in a pocket but powerful enough to connect to the world via the Internet continuously is a monumental work in progress (Twenge, Joiner, Rogers, & Martin, 2018).

Nomophobia is a contemporary fear explicitly created by the unavailability of one's smartphone (Kang & Jung, 2014; King et al., 2013; King et al., 2014). Nomophobia is an "abbreviation for no-mobile-phone phobia" (Yildirim, 2014, p. 6) and was a term initially used in a study by the United Kingdom (UK) Post Office in 2008 (SecurEnvoy, 2012). Yildirim (2014) explained how to use the term properly:

> Two other terms were introduced and used to refer to people with nomophobia: nomophobe and nomophobic. The noun nomophobe refers to someone who has nomophobia. The term nomophobic, on the other hand, is an adjective and is used to describe the characteristics of nomophobes and behaviors related to nomophobia. (p. 6)

Anshari et al. (2016) linked nomophobia with an abundance of research on cell phones' problematic usage: overuse, dependence, and addiction. SecurEnvoy (2012) stated that the first study on nomophobia was conducted in 2008. The UK Post Office commissioned the research company YouGov Plc to survey anxiety in 2,163 adults from the UK. The results of this 2008 survey indicated that 53% of British adults felt apprehensive when smartphones were misplaced, the battery ran out, or during a loss of connection (SecurEnvoy, 2012). However, four years later, this concern had "risen to 66% in the UK and show[ed] no sign of abating" (SecurEnvoy, 2012, Introduction section, para. 3). Also, the description of stress levels similar to those felt on a wedding

day was reported by 55% of respondents when unable to connect with friends and family (Nikhita, Jadhav, & Ajinkya, 2015).

In a study of 612 Turkish students aged 12 to 18, Durak (2019), found that smartphone addiction and nomophobia have a direct relationship. According to Tams, Legoux, and Leger (2018), smartphone withdrawal may play a part in creating nomophobia, which only occurs, as noted by Yildirim and Correia (2015), in certain situations when smartphones are unavailable. Thus, previous research supports that a high level of stress is the outcome for individuals with nomophobia in a smartphones' absence (Samaha & Hawi, 2016). Typical symptoms of nomophobia include: "anxiety, respiratory alterations, trembling, perspiration, agitation, disorientation, and Tachycardia" (Bhattacharya, Bashar, Srivastava, & Singh, 2019, p. 1298). Bragazzi and Del Puente (2014) suggested that experts view nomophobia as a psychopathological concern due to the stress shown by individuals with nomophobia.

All public schools in the United States (U.S.) were mandated to integrate technology throughout all subject areas by the Elementary and Secondary Education Act of 2001 (U.S. Department of Education, 2002). In 2010, The National Education Technology Plan continued this focus based on two basic givens: technology skills are critical for students to succeed in modern society, and technology improves learning (McMillan-Culp, Honey, & Mandinach, 2005; U.S. Department of Education, 2010). At the time of this research, technology was expected to be present in all classrooms. A wealth of research is ongoing regarding devices affecting students and learning; however, research on how devices affect teachers is minimal. O'Bannon and Thomas (2014) found that teachers 50 years of age and older perceive barriers to using smartphones in the

classroom, but teachers under the age of 32 perceive smartphones as useful tools for school-related work and support use in classrooms. O'Bannon and Thomas' (2014) research indicated a difference in teachers' perception by age group on smartphone usage. King et al. (2013) highlighted the concern of utilizing smartphones in classrooms due to both respondents in the control group and the respondents with diagnosed mental health disorders displayed dependence on these powerful tools. Both groups experienced emotional and physical reactions when smartphones were not available, but the group diagnosed with mental health disorders experienced more significant emotional and physical distress (King et al., 2013). Bhattacharya et al. (2019) recommended school authorities assign health personnel and school counselors to educate and mitigate nomophobia in schools, citing a formal proposal from Bragazzi and Del Puente (2014) that nomophobia should be included in the new *Diagnostic and Statistical Manual of Mental Disorders (DSM-V).* The research focused on nomophobia has increased exponentially with studies using children, adolescents, and college students as subjects. Specific studies on pre-service teachers, lawyers, nurses, and medical students are currently available. Unfortunately, at the time of this study, no published research was found regarding nomophobia using samples of employed teachers. Thus, life inside classrooms, regarding nomophobia, is an area for further exploration and research.

In summary, the background section began with a description of the setting where the teachers invited to respond to the survey were employed at ISACS schools in Kansas and Missouri. The research linking problematic phone usage, smartphone addiction, and nomophobia followed a brief history regarding the roots of nomophobia. Next, symptoms were explored with more in-depth discussion connecting nomophobia to

schools and the mental health field. Finally included was a brief history of the U.S. national mandates to integrate technology into every aspect of schools and briefly look at the under-researched users in classrooms: the teachers. A working knowledge of the terminology surrounding nomophobia is pertinent to grasp the scope of the study. Chapter 2 includes a more detailed and extensive discussion surrounding the history of and the literature about nomophobia.

Statement of the Problem

A growing body of research has indicated that society is indeed paying the price for constant connection (Twenge et al., 2018). Smartphones allow consumers to have the power and convenience of the Internet at all times (Nielsen Company, 2018b). However, it is generally known that smartphones can be addictive, and more smartphone usage begets more users entrenched in addiction (Lee, Chang, Lin, & Chang, 2014). As stated previously, Durak (2019) identified a link between smartphone addiction and nomophobia, which Dixit et al. (2010) found to affect people both physically and psychologically.

It is critical to analyze levels of nomophobia in teachers as the adults directly in charge of children. A teacher's emotional and physical well-being is an important indicator of a classroom's health and the children who inhabit those classrooms. Teachers set the tone for all that happens at school for eight hours, every single school day. Research has shown that parent smartphone overuse is becoming a significant factor in children's overall well-being (Radesky et al., 2016). Each moment of attention given to a mobile device reduces interactions with children, leading to fewer responses and lower growth outcomes (Radesky et al., 2016). Depending on levels of nomophobia,

teachers who do not have access to smartphones may become stressed, uncomfortable, and distraught (Dixit et al., 2010). Thus, exemplifying the need to assess nomophobia levels' of teachers as the next step in measuring the impact nomophobia may have on classrooms and children.

Technology has expanded classrooms exponentially, altering traditional methods of imparting knowledge. However, according to Eyyam and Yaratan (2014), the ever-growing challenge is to find a healthy balance of technology to maximize learning and minimize distraction. Determining whether teachers are struggling with nomophobia is a critical first step in assessing a healthy balance of technology use within the classroom. Because there is no published research assessing teachers' nomophobia levels, the need exists to determine whether nomophobia is a factor for teachers. If research identifies a significant issue, the need exists to determine if gender is a factor in teacher nomophobia. Also, the need exists to determine if different age groups of teachers struggle more with nomophobia. Finally, the need exists to determine if the school level taught is a factor in teachers' nomophobia. As policies and procedures are created regarding smartphone usage in the classroom, results may determine nomophobia is a critical factor to consider for teachers and students. In order to follow through with relevant action, Educational Leaders must be well informed. As was cautioned by Martinez, McGrath, and Foster (2016), technology should be used in the service of learning; policies and procedures should ensure teachers remain master of the classroom and technology the servant, not vice versa.

Purpose of the Study

Four purposes guided this study. The first purpose was to find out the extent teachers experience nomophobia. The second purpose was to identify if teachers' experience of nomophobia is different based on gender. The third purpose was to identify if teachers' experience of nomophobia is different based on the age group. The final purpose was to identify if teachers' experience of nomophobia is different based on the school level taught.

Significance of the Study

Teachers using smartphones in classrooms may be a concern because, as discussed previously, the more people use smartphones, the higher the risk of becoming addicted (Lee et al., 2014), and smartphone addiction is related to nomophobia (Durak, 2019). As stated, nomophobia has physical and psychological symptoms (Dixit et al., 2010), which may visibly affect teachers at work. A study identifying if teachers are significantly nomophobic is important because if teachers are uncomfortable and anxious due to withdrawal symptoms or distracted because of divided attention between technology and children, this may impede students' educational success. This study is vital to ignite awareness of teachers' nomophobia, aiding educators to proactively mitigate device usage and administrators to create healthy policies and procedures regarding smartphone usage at school. A working knowledge of whether a teacher's gender, age group, or grade level taught may be factors to consider regarding teacher nomophobia, will guide administrators in differentiated decision making. This study's outcomes may also help administrators promote an appropriate balance of new technology implemented in the classroom, school, and entire district. Research is

plentiful about student nomophobia, but this study will add to the literature regarding nomophobia in adults of different ages. Also, this may be the first study to measure nomophobia in employed teachers. If nomophobia is confirmed in teachers, results may guide future research to a more holistic picture of the overall impact of how nomophobia affects all stakeholders within classrooms.

Delimitations

Lunenburg and Irby (2008) discussed delimitations as partitions that define the parameters of the study. The following delimitations are present in this current study. This study's first delimitation was the teachers surveyed were limited to two Midwestern states: Kansas and Missouri. The second delimitation was the teachers surveyed were employed as private school teachers from schools accredited by ISACS. Cheng (2019) described private schools as inherently smaller and typically employing fewer teachers than public schools. In addition, policies vary by each private school and teachers are often involved in creating policies, as opposed to policies being created at a district level (Chen, 2019). The third delimitation was that this research study used an online survey to collect data. The fourth delimitation was that data collection occurred between April 27, 2020, through May 31, 2020, during the worldwide pandemic of COVID-19.

Assumptions

In order to carry out research, according to Lunenburg and Irby (2008), there are certain assumptions about claims, suggestions, and premises that are accepted as norms. "Assumptions are postulates, premises, and propositions that are accepted as operational for purposes of the research" (Lunenburg & Irby, 2008, p. 135). The following assumptions were made regarding the current research study. First, it was assumed that

participants adequately comprehended the concepts and vocabulary used in the survey. Second, it was assumed that respondents provided truthful responses to the survey. Third, it was assumed the survey outcome was an accurate reflection of the discernment of the participants. Fourth, it was assumed that the sample of participants was representative of the total population of private school teachers, early education through 12th grade.

Research Questions

Lunenburg and Irby (2008) described a solid research question as a lighthouse during the research process. In the form of clear and concise questions, this beacon formulates boundaries for the scope of the project effectively guiding the research away from treacherous seas (Lunenburg & Irby, 2008). Directing this study were the following four research questions:

RQ1. To what extent are teachers experiencing nomophobia?

RQ2. To what extent is the experience of nomophobia different among teachers based on gender?

RQ3. To what extent is the experience of nomophobia different among teachers based on age group?

RQ4. To what extent is the experience of nomophobia different among teachers based on school level taught?

Definition of Terms

Assuring all readers have a common understanding of key terms used in this study, definitions below include both unfamiliar concepts and familiar concepts which are more clinical in nature. Lunenburg and Irby (2008) explained the importance of definitions

detailed enough to replicate the study if warranted. The following terms were used in this study:

Addiction. As defined by Merriam-Webster: Addiction is

> (a) a compulsive, chronic, physiological, or psychological need for a habit-forming substance, behavior, or activity having harmful physical, psychological, or social effects and typically causing well-defined symptoms (such as anxiety, irritability, tremors, or nausea) upon withdrawal or abstinence: the state of being addicted. (b) a strong urge to do, use, or indulge in repeatedly. (Addiction, n.d. para. 1)

Kim (2006) stated the term addiction no longer requires a link to a chemical substance. The term addiction has been expanded to include behavioral addictions as those associated with interactive video games, texting/chatting/picture sharing, online gambling, cyberporn, and general Internet overuse (Kim, 2006).

Internet Addiction. According to Beard (2005), an addicted individual's mental, emotional, academic, social, and work state of being are all impaired by the Internet's overuse. Features included in Internet addiction are increased tolerance of being online, a dominant preoccupation with the online realm, and failed attempts to curtail the use of the Internet.

Nomophobia. Yildirim (2014) explained nomophobia as an "abbreviation for no-mobile-phone phobia" (p. 6). According to Dixit et al. (2010), nomophobia is related to an addiction disorder associated with smartphones. The experience of being without one's smartphone provokes symptoms of physical and psychological dependency consistent with withdrawal symptoms.

Problematic mobile phone use. As defined by Billieux (2012), problematic mobile phone use is "an inability to regulate one's use of the mobile phone, which eventually involves negative consequences in daily life" (p. 299). Problematic mobile phone use is often identified by the acronym PMPU.

Smartphone Addiction. A specific addiction to smartphones is described by Al-Barashdi, Bouazza, and Jabur (2015) and used interchangeably with the terms "mobile phone addiction, problematic mobile phone use, and mobile phone dependence...to describe more or less the same phenomenon, that is, individuals engrossed in their smartphone use to the extent that they neglect other areas of life" (p. 1). Kwon et al. (2013) detailed smartphone addiction symptoms as losing track of time engrossed on one's mobile device, a preoccupation and loss of control regarding the smartphone, withdrawal symptoms when the smartphone is not present, and negative affect on work, academic, and social lives.

Technoference. This term is an abbreviated combination of two words: technology and interference. Technoference refers to an interruption of face-to-face communication by attending to one's device. Common examples of technoference are checking phones during meals, relationship time, and playtime with children. Technoference is associated with relationship issues and behavioral problems with children (McDaniel & Coyne, 2016; McDaniel & Radesky, 2018).

Organization of the Study

This research study on nomophobia spans the breadth of five chapters. Chapter 1 included the background of the study, which comprises the overview of nomophobia, links to PMPU research, and discussions regarding addiction and the mental health field.

Next is the statement of the problem and purpose of the study. The significance and implications of nomophobia in employed, private school teachers and why nomophobia is important to research are discussed next, followed by the delimitations, assumptions, research questions, and definition of terms. Chapter 2 is an overview of the research literature regarding PMPU, smartphone addiction, media ecology, Maslow's Hierarchy of Needs theory, nomophobia, and how those relate to the worlds of work, home, and school. Also explored is the literature regarding the Nomophobia Questionnaire (NMP-Q). Chapter 3 details the methodology used for the study, describing participants' selection, instrumentation, data collection, and procedures for data analysis. Limitations of the study follow, and the chapter concludes with a summary. Chapter 4 presents the findings of the research, including descriptive statistics, hypothesis testing, and additional analyses of the four underlying factors of nomophobia. Chapter 5 synthesizes the previous chapters by summarizing the entire study, discussing the findings related to literature, and detailing the significance of the research. Finally, conclusions about the study include implications for action, recommendations for future studies, and concluding remarks.

Chapter 2

Review of the Literature

This chapter is a review of the literature as it relates to research regarding nomophobia. Six sections are used to organize the review of the literature. First is a brief overview of media ecology which offers a historical window of consumer technology. Second is the historical context of Internet technology research which concerns overuse, addiction, and problematic mobile phone usage (PMPU). Third is a brief look at Maslow's hierarchy of needs pertaining to the issues surrounding PMPU, smartphone addictions, and nomophobia. Fourth is an overview of nomophobia and how the four underlying factors relate to home, work, and school, specifically. Fifth is a specialized focus on gender and age of smartphone users. Sixth is the literature surrounding the NMP-Q survey created and validated by Yildirim (2014).

The Role of Media Ecology

It is impossible to discuss nomophobia and how this fear of being without a smartphone affects individuals in society without first understanding media ecology. Decades before smartphones or the Internet existed, McLuhan and Fiore (1967) offered insight regarding technology changing society:

> The medium, or process, of our time - electric technology - is reshaping and restructuring patterns of social interdependence and every aspect of our personal life. It forces us to reconsider and re-evaluate practically every thought, every action, and every institution formerly taken for granted. Everything is changing – you, your family, your neighborhood, your education. . . . Societies have always been shaped more by the nature of the media by which men communicate than by

> the content of the communication . . . Our ‘Age of Anxiety’ is, in great part, the result of trying to do today’s job with yesterday’s tools - with yesterday’s concepts. (pp. 8-9)

Lum (2000) stated that media ecology is “[a] complex relationship among the media and, on another level, between media and the various forces in society” (p. 1). McLuhan first proposed media ecology as a theory in 1964, as cited in McLuhan and Fiore (1967), who together expanded on the basic premise introducing the idea of the media of a time period, or an epoch – the latest epoch being the electronic era (McLuhan & Fiore, 1967). Lum (2000) explained epoch as characterizing society’s spirit and described that media ecology is linked to technology, communication, and culture.

McLuhan (1964) described the differences in what he termed hot and cold media. Hot media consists of static input (examples are pictures, television, or articles); cold media requires an interactive response (an example is a telephone conversation). Social media is now an interactive conversation on a global scale. Lum (2000) discussed McLuhan (1964) coining the term global village and even gave McLuhan credit for predicting the Internet decades before these worldwide connections were possible. Today, every human who owns a smartphone is connected globally, and thus is a part of McLuhan’s (1964) global village.

Smartphones, the modern-day tool for communication, has literally placed the world in the user’s hand. Gencarelli (2000) discussed that culture and communication, two important aspects of media ecology, are integral to social change because:

> It must also be emphasized that language is the primary medium of communication in day-to-day life. It is the basic means through which people

> share experiences and the key to what is usually thought of as meaning and meaningful. It is also the medium that is most often taken for granted, as though it were a natural, intrinsic part of human existence. (p. 99)

Mobile phones, used initially to communicate, have taken on a multitude of other tasks and are currently used to shape users' identities (Garcia-Montes, Caballero-Munoz, & Perez-Alvarez, 2006). This handheld device is not only a phone, but also calculator, address book, entertainment, calendar, research instrument, camera, filing cabinet, social media, historian, personal assistant, and countless other possibilities too numerous to mention.

Traxler (2011) stated that two different spaces exist in modern culture: digital space and physical space; a smartphone connects these spaces. Also, the lines have been blurred between real life and digital life. According to Traxler (2011), this blurring has changed how the world is viewed, both relationally and communally. Traxler (2011) described how mobile devices have forced change:

> Mobile devices demolish the need to tie particular activities to particular places or particular times. They are reconfiguring the relationships between public and private spaces and how mobile virtual spaces penetrate these relationships. Virtual communities and discussions had previously been mediated by static networked PCs in dedicated times, places and spaces. Now, mobile technologies propel these communities and discussions into physical public and private spaces, forcing changes and adjustments to all three as we learn to manage a more fluid environment. (p. 26)

What initially began as a conduit of communication, the many aspects of smartphone use have become what Lum (2000) may have agreed, is part of a global village's new epoch.

Technology: Addiction, PMPU, and Overuse

Apple released the first iPhone in June of 2007 (Sanford, 2020), but the body of research on smartphone usage has only begun to scratch the surface of how these devices have changed individuals and society (Twenge, 2017). Essentially, daily life patterns have been altered globally due to mobile devices (Duxbury, Higgins, Smart, & Stevenson, 2014). Mick and Fournier (1998) originally described the phenomenon of technology addiction as a paradox of control vs. chaos, and "freedom vs. enslavement in a reversible master-slave relationship . . . feelings of conflict, ambivalence, and stress were readily implicated" (p. 129).

Goldberg (as cited by Young, Pistner, O'Mara, & Buchanan, 1999) is credited as unexpectedly discovering a novel disorder: Internet Addiction Disorder (IAD). Goldberg posted on a psychologist website in 1995 a disorder he satirically created called IAD; listed were pathological symptoms including cyber-sexual and relationship addiction, video gaming addiction, Internet compulsions, and information overload. The website was inundated with people identifying with Goldberg's make-believe disorder (Young et al., 1999). Due to technological advances, the Internet no longer needs to be plugged in and is carried around constantly in the form of smartphones. Individuals with an Internet addiction are impaired mentally, emotionally, academically, and socially by the overuse of technology easily accessible through a smartphone (Beard, 2005).

Research has flourished over the last decade regarding problematic mobile phone use (PMPU). Billieux (2012) described PMPU as the inability to regulate mobile phone

usage, eventually causing negative daily life consequences. Walsh and White (2007) led a study using 252 university students from Australia. This was one of the first studies to evaluate high levels of PMPU from a psychological viewpoint versus a sociological viewpoint. Walsh and White (2007) identified three categories of PMPU: risky or dangerous usage (texting while driving), inappropriate usage (phone usage inside a theater), and overuse. Choliz (2012) stated that all three types of problematic uses of phones point to smartphone addiction.

Twenge et al. (2018) discussed how the smartphone might have been the catalyst that sent the iGeneration, children born between 1995 and 2012, onto the brink of a mental health crisis: adolescent depression and suicide rates have burgeoned nationally since 2011. Turkle (2016) stated after five years of social science research conducting countless interviews with children, teenagers, college students, parents, educators, and managers in the U.S. that 25% of teens are on smartphones immediately each morning and send at least 100 texts per day. Concerning conclusions drawn from this research about teens include: limited face-to-face conversations, poor social skills, and evidence of isolation and loneliness (Turkle, 2016). Also, Lin (2016) identified social media as being associated with depression, sleep issues, and eating concerns in 1,787 adults age 19 to 32 from the U.S.

Smartphone overuse has been researched using classic addiction symptoms. Specifically, Kwon et al. (2013) identified the following six factors while creating the Smartphone Addiction Scale (SAS): “daily-life disturbance, positive anticipation, withdrawal, cyberspace-oriented relationship, overuse, and tolerance” (p. 7). A study conducted by Bianchi and Phillips’ (2005) utilizing a sample of 195 participants ages 18

to 85 from the UK identified several psychological predictors for suspecting addiction to a mobile phone: “age, extraversion, and low self-esteem...as extraverts are more likely to take risks” (p. 39). Research has expanded, adding more psychological predictors of PMPU: gender, socio-economic status, emotional intelligence, personality, self-esteem, social skills, ability to adjust, alcohol/drug use, and other comorbid psychopathology (King, Valenca, & Nardi, 2010; Rosen, Whaling, Rab, Carrier, & Cheever, 2013; Sanchez-Martinez & Otero, 2009). King et al. (2010) studied a patient who could not be separated from a mobile phone due to being overwhelmed with the need to reach out for help if sudden illness occurred. King et al. (2010) detailed treatment using medication and cognitive behavior therapy to overcome this irrational fear. Rosen et al. (2013), in a study utilizing a sample of 1,143 teenagers and young adults, specifically found that “More Facebook friends predicted more clinical symptoms of bipolar-mania, narcissism, and histrionic personality disorder, but fewer symptoms of dysthymia and schizoid personality disorder” (p. 1243). Sanchez-Martinez and Otero (2009) studied 1,328 adolescents from nine high schools in Spain. Sanchez-Martinez and Otero (2009) found that 41.7% of teens intensively use cell phones; this usage level was correlated with being female, using alcohol and tobacco, depression, and academic failure.

Physical symptoms have also been identified by people experiencing separation anxiety from smartphones: increased heart rate, anxiety, raised blood pressure, and unpleasant feelings (Clayton, Leshner, & Almond, 2015). In 2019, Durak linked smartphone addiction with separation anxiety from smartphones, better known as nomophobia, in a study involving 612 Turkish students in the 12-18-age group. King et al. (2013) stated that problematic phone use, smartphone addiction, and overuse is a

concern. Dependence on these powerful devices affects people both emotionally and physically (King et al., 2013).

Hierarchy of Needs and Smartphone Usage

Smartphones are potent tools of modern society (Reid & Thomas, 2019). Kang and Jung (2014) proposed, "Even though the smartphone is used for social connections and interactions, what leads to continuous use is self-actualization rather than self-esteem or networking traits" (p. 385). Maslow's hierarchy of needs theory (1943) described that humans are intrinsically motivated to fulfill these five human needs: physiological, safety, social, self-esteem, and self-actualization. Self-actualization is the ultimate goal (Maslow, 1943), and common tools used to reach that goal in modern society are smartphones (Kang & Jung 2014; Meyer, 2015).

Maslow (1943, 1962, 1987) stated that human needs are similar to innate instinct and play a major role in behavior. Maslow's (1943) initial theory described the first four needs as deficiencies, and the apex need as growth or being needed. Initially, Maslow (1943) declared the lowest level of needs must be satisfied before the higher levels can be achieved. For example, if one has a physical need for food or is unsafe, it is not easy to respect others or maintain self-confidence (Maslow, 1943). However, later Maslow (1962) clarified that when a deficiency need is more or less satisfied, the motivation and focus on that need dissipates, and a person's activity will naturally be directed toward meeting the next level of needs.

According to Maslow (1987), all humans desire and have the ability to reach the highest level of self-actualization. However, due to deprivation of the four levels of deficiency needs, one's journey toward self-actualization may be interrupted as precious

energy is spent bouncing between the lower levels driven by the motivation to satisfy these needs. As a person's needs are met, the natural motivation to fulfill these needs decreases. This clears the way for a natural increase in a person's motivation to strive for self-actualization (Maslow, 1987).

Maslow's theory (1943, 1962, 1987), according to Kiel (1999), has been cited as historical foundation for students' basic biological, physical, and safety needs to be met prior to embarking on the process of learning. Also, Kiel (1999) discussed how schools utilize the Hierarchy of Needs (Maslow, 1943, 1962, 1987) as a theoretical basis to enhance personal security allowing students to thrive academically. Specifically, anti-bullying campaigns and safe-place campaigns for all types of diversity (religion, race, socio-economic, disability, and sexual-preferences) find roots in Maslow's hierarchy of needs theory (Parkay, Anctil, & Hass, 2014). Alexander (2005) stated that Maslow's theory (1943, 1962, 1987) had been well accepted and utilized in the educational arena. According to Meyer (2015), Apple has used Maslow's theory to hook smartphone users as designers strive to meet all users' needs with a smartphone.

Human motivation, according to Maslow (1962), decreases as deficiency needs are met. Meyer (2015) stated that smartphones are the tools humans now utilize to meet these deficiency needs and even strive for self-actualization. The purpose of the Nielsen Company's *Quest for Convenience* report (Nielsen Company, 2018b) was to inform producers of consumer trends. According to the Nielsen Company (2018b), smartphones are the conduit for making life more convenient. Detailed in the report is the rise in smartphone trends meeting physiological needs such as ordering sustenance through apps such as Door-Dash. Also, the Nielsen Company (2018b) reported more and more

consumers using smartphones to meet the need for shelter through apps like Airbnb or Hotels Tonight. Meyer (2015) reported that physiological, safety, and shelter needs all center around how and where humans live. The Quest for Convenience report (Nielson, 2018b) further detailed a rise in consumer use of smartphones for transportation services through Uber, Lift, or Taxis. Also, mobile phone apps such as PayPal, Apple Pay, and online banking foster the convenience of direct payment transfers to businesses and individual to individual, thus eliminating the use of physical monetary exchange (Nielson, 2018b).

Once the lower-level needs of physiological functioning and safety have been met, Maslow (1943) originally stated the individual could focus on the next levels of need: love and belonging, followed by self-esteem. Social-media creators make no apologies for the exploitation of humans on a psychosocial level. Allen (2017) who quoted Sean Parker, founder of Facebook, discussing the thought process of developing Facebook:

> It probably interferes with productivity in weird ways. God only knows what it's doing to our children's brains . . . [Facebook] literally changes your relationship with society, with each other. . . The thought process that went into building these applications, Facebook being the first of them . . . was all about: 'How do we consume as much of your time and conscious attention as possible?' (Allen, 2017, para. 1)

The heightened use of social networking sites, Facebook and Instagram specifically, have been shown to directly correlate with typical symptoms found in depression (Chou & Edge, 2012; Donnelly & Kuss, 2016; Lup, Trub, & Rosenthal, 2015;

Steers, Wickham, & Acitelli, 2014; Tandoc, Ferrucci, & Duffy, 2015). A research study conducted by Chou and Edge (2012) utilized a sample of 425 undergraduate students and Facebook users. A significant number of participants felt others on Facebook were most likely happier and engaged in a better life than themselves. Donnelly and Kuss (2016) found in an online study of 103 young adults that Instagram usage, specifically, was a predictor of depression symptoms. In another study, Lup et al. (2015) found a direct association with higher Instagram use, leading to a higher number of depressive symptoms in a sample of 117 self-proclaimed social media users. Steers et al. (2014) found a relationship between students who compared themselves with others' social lives on Facebook and depressive symptomology in a study utilizing a sample of 180 students from a large Southwestern university. Tandoc et al. (2015) studied the feelings of jealousy sparked by Facebook users in an online survey utilizing a sample of 736 college students. Tandoc et al. (2015) found when Facebook envy is controlled; participants report fewer depressive symptoms.

Overall concern for mental health and well-being has been linked with overuse in a multitude of studies. Twenge et al. (2018) reported a higher level of time spent on screens significantly correlated with depression symptomology and increased risk of suicide. Hunt, Marx, Lipson, and Young (2018) identified a causal role of social media and well-being. Using a sample of 143 undergraduates from the University of Pennsylvania, Hunt et al. (2018) randomly assigned students to two groups: one group limited all social media platforms to ten minutes per day, the other group was not limited. In short, the study identified that when students used less social media, both depression and loneliness symptoms significantly decreased in the sample. Chou and Edge

(2012) found in a study utilizing a sample of 425 university students from Utah, “Those who have used Facebook longer agreed more that others were happier, and agreed less that life is fair, and those spending more time on Facebook each week agreed more that others were happier and had better lives” (p. 117). Hunt et al. (2018) suggested that believing others’ lives are better than one’s own is easy when viewing someone else’s curated life online.

However, even with correlational and causal research to the contrary, social media is stronger than ever for consumers (Nielsen Company, 2018a). Bian and Leung (2014) found that more quiet, shy, or lonesome people are more likely to attempt to satisfy social needs and needs for esteem through social media. Bian and Leung (2014) reported in a study utilizing a sample of 414 university students that loneliness and shyness is linked to smartphone addiction symptoms. The results of this research study indicated the higher a student scored in loneliness or shyness, the more likely this student would utilize the smartphone to satisfy social needs online. However, this simultaneously inversely affected face-to-face social capital (Bian & Leung, 2014).

According to Allen (2017), social media was created knowingly exposing a vulnerability in human psychology by providing a hit of dopamine when a picture or post is liked. Spreckelmeyer et al. (2009) studied the brain’s neural pathways, processing reward systems, and addiction from social stimuli. Over the years social stimuli, like a positive emotional expression, has been documented to activate the neurological reinforcement system (Spreckelmeyer et al., 2009). Even the hope of receiving positive social feedback, activates reward pathways releasing dopamine Spreckelmeyer et al. (2009). These reward pathways are triggered by social media and release the same

chemical reaction in the brain as food, exercise, gambling, drugs, sex, and love (Krach, Paulus, Bodden, & Kircher, 2010). Skinner (1951) first identified a variable ratio schedule as the best way to reinforce behavior. These rewards delivered on a random basis are akin to both payouts on a slot machine and likes on social media. A simple like on social media becomes a dopamine-triggering reaction that reinforces a habit or addiction (Hunt et al., 2018). Initially, people may feel that Maslow's (1943, 1987) needs for love, belonging, and esteem are being met by social media, but the wealth of presented research does not concur. Specifically, Bian and Leung (2014) stated that more lonely and shy people are, the more apt the person is to attempt to satisfy social needs online, thus affecting one's real-life social skills.

Maslow (1943) gave structure to Kang and Jung's (2014) two studies utilizing a sample of 398 U.S. college students and 331 Korean college students. The first study utilized Maslow's (1943) five basic needs as constructs on the Smartphone Basic Needs (SBN) scale. The relationship between the SBN, PMPU, and quest for life satisfaction was analyzed in the second study by Kang and Jung (2014). The results from both the U.S. and Korean samples indicated that both samples believe smartphones fulfill the needs for Safety and Self-Actualization, which, according to Maslow (1943), predicts an overall satisfaction in one's life. Nonetheless, Meyer (2015) suggested negative emotional ramifications are the result as people attempt to fulfill basic needs with technology.

As described by Maslow (1943), motivation is the key factor in human behavior. Obviously, people are motivated differently. Hooper and Zhou's (2007) research involving a sample of 184 New Zealand students linked seven factors of motivation to

different mobile phone behavior (voluntary, habitual, dependency, addictive, compulsive, and mandatory). Out of these seven factors of behavior, the greatest motivations to use mobile phones were found to be the mandatory, voluntary, and dependent factors. Hooper and Zhou (2007) defined these motivations as coinciding with the deficiency needs Maslow (1943, 1962, 1987) described as what motivates people to resolve and move toward self-actualization.

In short, Maslow's (1943, 1962, 1987) overarching needs are exemplified in schools by social workers, free and reduced lunch programs, and counselor support systems as an effort to impact learning. In a quest to measure what exactly impacts learning in the classroom, Hattie (2012) wanted to know how much certain influences actually affect student achievement either positively or negatively. Hattie (2012) originally identified the home, school, curricula, teachers, and pedagogy elements, measuring how much each element affects children's learning. Hattie (2017) expanded the list and has identified more than 252 influences related to student achievement, including many areas of technology. Hattie found that information communications technology most likely has "the potential to accelerate student achievement" (Hattie, 2017, p. 2), and mobile phones are "likely to have a positive impact on student achievement" (Hattie, 2017, p. 2). Additionally, reducing anxiety was found "likely to have a positive impact on student achievement" (Hattie, 2017, p. 2), and depression was found "likely to have a negative impact on student achievement" (Hattie, 2017, p. 2). In isolation, the impact of these elements are understandable, but the addition of more recent research identifying anxiety and depression linked to the use of smartphones is of

concern (Twenge et al., 2018). However, as of 2017, nomophobia was not researched as an element by Hattie (2017).

Smartphones may have enhanced people's lives in many ways, but the quest to fulfill Maslow's (1943) basic human needs with smartphones (Meyer, 2015) may have repercussions. As the literature above has shown, overuse of smartphones may lead to addiction, dependency, mental health issues, and possibly nomophobia. Specifically, the separation anxiety from smartphones, called nomophobia, must be better understood to minimize the effects in specific areas such as work, home, and school (Clayton et al., 2015).

Nomophobia

Nomophobia, a relatively new phenomenon, is described as a disorder found specifically in modern society (Kang & Jung, 2014; King et al., 2013; King et al., 2014). Nomophobia is described as separation anxiety from a smartphone and is caused by smartphone overuse (Bragazzi & Del Puente, 2014). According to King et al. (2013), nomophobia is the anxiety and discomfort felt by individuals who use virtual communication devices to connect to the Internet habitually and cannot access mobile devices. Yildirim and Correia (2015) defined nomophobia as "the fear of being unable to use one's mobile phone or being unreachable through one's mobile phone" (p. 1323).

At the time of this study, nomophobia was a term not commonly used. Nomophobia was originally used in a study commission by the UK post office in 2008 to measure anxiety felt when users are without mobile phones. In a literature review, Rodriguez-Garcia et al. (2020) stated the current literature on nomophobia "is in an exploratory phase, with a greater predominance of descriptive, non-experimental, and

cross-sectional studies that explore the prevalence of nomophobia mainly in adolescents and university students" (p. 1). Nomophobia is discussed as a two-edged disorder, highlighting both the freedom and enslavement of technology (King et al., 2013; Mick & Fournier, 1998).

Bragazzi and Del Puente (2014) indicated that nomophobia is a possible mental health concern. Durak (2019) studied a sample of 612 Turkish students in the 12-18-age group and identified a relationship between smartphone addiction and nomophobia. Also, Durak (2019) found that PMPU is related to both addictions and nomophobia. Durak (2019) further explained that prevention activities should be a priority when managing students whose smartphone use is not mediated. Rodriguez-Garcia et al. (2020) stated:

> Nomophobia negatively affects personality, self-esteem, anxiety, stress, academic performance, and other physical and mental health problems . . . which negatively affects a person, causing psychological problems and physical and behavioral changes. (p. 1)

King et al. (2013) described nomophobia as uncomfortable and anxious feelings people experience when unable to use smartphones. As of 2021, nomophobia has not been added to the *DSM-V* as a specific disorder. Bragazzi and Del Puente (2014) suggested that akin to compulsive gambling, nomophobia is a non-drug addictive behavioral disorder. Another concern stated by Bragazzi and Del Puente (2014) is comorbidity which is a clinical way to explain pathologies that tend to go hand-in-hand with nomophobia: anxiety, panic disorder, and multiple phobias; obsessive-compulsive disorders, eating disorders, and depression; behavioral addiction disorders and

personality disorders. Bragazzi and Del Puente (2014) stated, “In these cases, nomophobia may act as a proxy for a more serious psychiatric disorder” (Comorbidity section, para 1). Recommendations for treatment include cognitive behavioral therapy and chemical interventions (Bragazzi & Del Puente, 2014)

A study utilizing a sample of 120 adults from Brazil conducted by King et al. (2013) indicated those who had been previously diagnosed with anxiety and panic issues were more nomophobic than those not diagnosed with mental disorders. A study conducted by Bragazzi, Re, and Zerbetto (2019) utilizing a sample of 403 young Italian adults indicated that subjects with nomophobia tend to adopt inappropriate coping strategies when stressed: self-isolation, denial, self-accusation, distraction, anger, and neediness (Bragazzi et al., 2019). Rosales-Huamani, Guzman-Lopez, Aroni-Vilca, Matos-Avalos, and Castillo-Sequera (2019) using a sample of 461 engineering students identified three symptoms of nomophobia that interfere with academic life: feelings of anxiety, compulsive smartphone use, and panic. These outcomes suggest that intervention and preventative measures regarding nomophobia should be a point of focus (Bragazzi et al., 2019).

Bragazzi and Del Puente (2014) described nomophobia as a type of anxiety about being separated from a cell phone which could indicate serious pathology. Understanding all the pieces of the nomophobia puzzle is important. Yildirim and Correia (2015) determined nomophobia has four underlying factors: the fear of being unable to communicate, the fear of losing connectedness, the fear of being unable to access information, and the fear of losing convenience (Yildirim & Correia, 2015).

These four factors are key to understanding how smartphone usage and nomophobia affect people throughout daily life.

The fear of being unable to communicate. Technology enables humans to contact others 24 hours per day (Albrecht & Michael, 2013). However, the communication piece is larger than just having friends' and families' numbers stored on the phone. Mobile devices have become an integral, comfortable space for communication (Twenge, 2017). According to King et al. (2013), people who develop a dependency on communication through devices prefer to avoid direct face-to-face social relations and are more likely to have a social phobia. In essence, this is a transference of relationship-building to the online world where comfort is more attainable rather than building relationships in the real world. If this online communication avenue of comfort and safety is not available, King et al. (2013) pinpointed this as a source of sparking anxiety and fear in individuals with nomophobia.

A study conducted by Shalom, Israeli, Markovitzky, and Lipsitz (2015) focused on fears in society generating physical arousal concerning online communication vs. in-person communication. Shalom et al. (2015) utilized a sample of 73 students from a large university in Israel. The study results indicated that participants who prefer communicating through devices deem themselves more successful online than in real-life or in-person communications (Shalom et al., 2015).

Bartwal and Nath (2019) studied a sample of 451 undergraduate medical students in Northern India. At some level, nomophobia was found in 100% of the students surveyed: 15.5% of the students surveyed indicated mild nomophobia, 67.2% of the students surveyed reported moderate nomophobia, and 17.3% of the students surveyed

reported severe nomophobia. Furthermore, the most concerning underlying factor of nomophobia indicated from the sample was the fear of being unable to communicate (Bartwal & Nath, 2019).

Moreno-Guerrero, Lopez-Belmonte, Romero-Rodriguez, and Rodriguez-Garcia (2020) studied a sample of 849 students enrolled in teacher education programs at three different universities in Spain. Moreno-Guerrero, Lopez-Belmonte, et al. (2020) concluded that pre-service teachers were not atypical regarding nomophobia. However, one area of elevated concern for future teachers was the fear of being unable to communicate (Moreno-Guerrero, Lopez-Belmonte, et al., 2020).

Moreno-Guerrero, Aznar-Diaz, Caceres-Reche, and Rodriguez-Garcia (2020) completed a larger study utilizing a sample of 1,743 students ages 12-20 from Spain. Moreno-Guerrero, Aznar-Diaz, et al. (2020) found an intermediate level of nomophobia in the sample. However, the fear of losing communication was of the utmost concern to the population in this study (Moreno-Guerrero, Aznar-Diaz, et al., 2020).

The old proverb, Practice Makes Perfect, is an ancient Chinese idiom meaning: the more one practices, the better one's skills (Li, 1999). If individuals only practice online communication, in-person communication skills may diminish even further. This perpetuates a vicious cycle of anxiety and dependence on smartphones (Bian & Leung, 2014).

The fear of losing connectedness. Bowlby's attachment theory (1973) suggested a trusting connection with a caregiver is essential in order to become a fully functioning, emotionally prosperous adult. As previously discussed, Maslow (1943) theorized that survival needs only surpass one's need to belong. Attachment is a necessary connection

to others. This attachment, according to Maslow (1943) and Bowlby (1973), is critical for healthy growth and development. Han, Kim, and Kim. (2017) utilized a sample of 301 young adults in Korea to research how attachment literature can explain nomophobia's underlying basis. The results of a study using structural equation modeling, conducted by Han et al. (2017), indicated that memories elicited by smartphones caused individuals with higher levels of nomophobia to broaden their persona to include their smartphone. Han et al. (2017) posed that technology has become a personalized extension of self. Nomophobic tendencies have been hypothesized to only increase as technology advances into more personal convenience and the creation of more powerful features to streamline communication (Han et al., 2017). Johnson (2008) clarified that humans look to connect with others in three specific ways: if the person is available when needed, are responsive to provide comfort, and show a higher level of care when not physically together.

Hart, Nailling, Bizer, and Collins (2015) noted that comfort could be provided with a touch of a smartphone's button through a connection via social media in today's world. A study conducted by Hart et al. (2015) utilizing a sample of 267 participants, half from the U.S. and half from abroad, all between the ages of 19 to 73 found that people who have an anxious attachment style are predisposed to attention-seeking behavior on social media. In a speech, Sean Parker, the founder of Facebook, discussed "exploiting a vulnerability in human psychology. Whenever someone likes or comments on a post or photograph, we give you a little dopamine hit . . . It's a social-validation feedback loop" (Allen, 2017, p. 1). These social media validations make one feel connected, cared about, or even comforted, according to Nitzberg and Farber (2013).

Using Bowlby's (1973) four attachment styles (secure attachment, anxious attachment, avoidant attachment, and disorganized attachment), Nitzberg and Farber's (2013) online study consisting of a sample of 336 emerging adults from 18 to 29 years of age provided evidence that anxious and disorganized attachment styles in young adults could predict an avoidance of in-person communication and overuse of social media. Those with anxious attachment predicted feelings of intimacy during social networking, possibly reflecting a need for comfort from others (Nitzberg & Farber, 2013).

When a person's smartphone is unavailable, that important connection is disrupted. Gutierrez-Puertas et al. (2019) conducted an observational study utilizing a sample of 258 nursing students from Spain and Portugal. The students from Spain and Portugal were found to be significantly nomophobic. However, the students from Portugal scored higher than students from Spain in the area of feeling the strong need to stay connected with family and friends (Gutierrez-Puertas et al., 2019). As stated by the Nielsen Company (2012), Pankraz put it quite simply, "I share, and therefore I am" (Nielsen Company, 2012, para. 1) describing youth in 2012. Pankraz called these youths the Now Generation and Generation C, for connected (Nielsen Company, 2012).

Bowlby (1973) stated that a connected friend reduces alarm in stressful situations, and being alone in an uncomfortable situation intensifies fear. Being without one's cellphone, the conduit of connection, may be akin to being without a friend in potential real-life situations. Further studies are necessary to identify a relationship between higher levels of nomophobia and feeling uncomfortable in real-life social situations. People with higher smartphone addiction deem face-to-face social situations uncomfortable or stressful (Bian & Leung, 2014).

The fear of being unable to access information. "We the information predators and the information prey, must ask who is made smarter and who will ultimately be empowered by these so-called intelligent systems" (Albrecht & Michael, 2013, p. 32). A warning, in short, of concerns for everyone being connected to everything. Carr's (2008) poignant description in the now-famous essay, "Is Google Making Us Stupid?"*:*

> I've had an uncomfortable sense that someone, or something, has been tinkering with my brain, remapping the neural circuitry, reprogramming the memory . . . I'm not thinking the way I used to think . . . Now my concentration often starts to drift after two or three pages. The deep reading that used to come naturally has become a struggle . . . Even when I'm not working, I'm as likely as not to be foraging in the Web's info-thickets, reading and writing e-mails, scanning headlines and blog posts, watching videos, and listening to podcasts, or just tripping from link to link to link . . . what the Net seems to be doing is chipping away at concentration and contemplation. My mind now expects to take in information the way the Net distributes it: in a swiftly moving stream of particles. Once I was a scuba diver in the sea of words. Now I zip along the surface like a guy on a Jetski. (pp. 1-2)

Wolf and Stoodley (2007) stated, "We are not only what we read. We are how we read" (p. 27). Reading quickly and in short, bursts may be weakening the modern brain's ability to deep read. In other words, this information streaming connection is changing the brain (Wolf & Stoodley, 2007). Furthermore, researchers have suggested that online reading promotes mere decoding of information, and the ability to interpret text which takes rich mental connection is largely disengaged (Wolf & Stoodley, 2007).

In 2021, the ability to stream limitless information has simply allowed human brains to be lazy and not commit things to memory which was necessary in previous generations (Sparrow, Liu, & Wegner, 2011). Google, Wikipedia, and other Internet search engines available on smartphones nullify the function of committing facts to memory. Sparrow et al. (2011), using a sample of 46 undergraduate students at Harvard University, found that most students quickly accessed the Internet to help find the needed answers when respondents were asked a difficult question. Sparrow et al. (2011) described the Web as the quintessential external hard-drive storing information outside of the brain: "The experience of losing our Internet connection becomes more and more like losing a friend. We must remain plugged in to know what Google knows" (p. 777). Memorizing menial items like phone numbers or addresses is now deemed as a chore because people are predisposed to rely on devices to complete the task. For example, maps are neither necessary to own nor learn how to read. Smartphones not only provide information on how to get from point A to point B, but also how long the trip will take, any hazards or traffic along the way, and access to food, fuel, or facilities necessary to complete the trip (Sparrow et al., 2011). The issue concerning nomophobia, however, occurs when a person's smartphone is unavailable and one becomes lost with neither access to a map nor the skills to read one.

In 2015, Barr, Pennycook, Stolz, and Fugelsang, through an online survey utilizing a sample of 190 Americans, found evidence that less analytical individuals rely on smartphones for information instead of engaging in a reasoning process that takes effort. This usage of a smartphone is referred to as the extended mind. In other words, the smartphone assumes the job of thinking for the user. When a smartphone becomes

suddenly unavailable, certain anxious feelings are understandable when one is accustomed to having access to limitless information (Cheever, Rosen, Carrier, & Chaves, 2014).

Researchers have targeted students in highly challenging programs to measure levels of concern regarding the loss of access to information when smartphones are unavailable. A study in India by Dasgupta et al. (2017) involved a sample of 303 medical and 305 engineering students. The objective was to analyze the difference in nomophobia levels and behaviors and identify predictors related to PMPU. Dasgupta et al. (2017) found that 44.6% of engineering students surveyed were significantly nomophobic, as opposed to 42.6% of medical students surveyed. Both the engineering and medical student groups were most concerned about being unable to access information (Dasgupta et al., 2017).

The fear of losing convenience. Finally, the last dimension of nomophobia identified is the fear of losing convenience (Yildirim & Correia 2015). As quoted from the Nielsen Company report (2018b), The Quest for Convenience:

> Rising Internet penetration, denser urban locations, faster-paced lifestyles, and challenging working hours add more complex layers to consumers' lives. According to the World Health Organization, 'workplace stress is the health epidemic of the 21st century,' and multiple agencies have tracked the steady rise of anxiety-related illnesses worldwide. Consumers feel more stretched than ever before and are increasingly striving for convenient solutions that simplify their busy lives. (pp. 1)

Sitaraman and Krishnan (2013) studied the habits of 6.7 million Internet users and found that study participants started abandoning viewing a website after two seconds of not loading, after five seconds 25% of participants left the site, and half of the subscribers abandoned viewing the website after 10 seconds. Instant gratification is not a novel idea, but today's technology has carried this to a completely different level. The patience muscles of modern society are fragile (Sitaraman & Krishnan, 2013).

According to the Nielsen Company's (2018b) *Quest for Convenience* report, retailers have learned that people are willing to pay for convenience. Individuals pay extra for same-day delivery on anything from snack foods to alcohol. Movies streamed directly into homes are available immediately. Fresh meals can be delivered to the door, ready to eat – no shopping, cooking, or cleaning necessary. Smartphones are the conduit of convenience. Marketers carefully plan ways to capture consumer needs and satisfy those needs immediately through a quick swipe on a mobile device (Nielsen Company, 2018b). Simply put, if one's smartphone is unavailable, then the direct route to comfort and convenience is broken.

Nomophobia at work. Millennials are individuals born between 1980 and 2000 who are tech-savvy, have never been tethered by technology, and are a large part of today's workforce (Bannon, Ford, & Meltzer, 2011). The Pew Research Center (2018) stated 75% of U.S. adults belong to an online social network, 62% of American adults connect to the Internet using a handheld device, and 83% keep phones close by twenty-four hours a day viewing the device as an extension of self. Smartphones have increased productivity and efficiency by allowing employees to respond to emails and work on digital platforms and team spaces without even being on the same continent as the

physical organization (Duxbury et al., 2014). However, researchers have begun to focus on the drawbacks of smartphones in the workplace. Montag and Walla (2016) identified that smartphones could be useful to a point, but these same useful devices can interrupt one's work or flow if left unmitigated. Flow is described as complete absorption into an activity (Montag & Walla, 2016). Csikszentmihalyi (1997) described flow as one's best productive state, forgetting about time and space. Flow is achievable when one's prowess is equal to the task and occurs when an extended amount of time and uninterrupted concentration is achieved (Csikszentmihalyi, 1997). The results of a study utilizing a sample of 300 undergraduates from Michigan State University indicated that even a brief interruption of 2.8 seconds could disrupt the flow state (Alton, Trafton, & Hambrick, 2014).

Smartphones' visual and audible signals alerting the user to a message either by text, email, or social network can disrupt flow. Oulasvirta, Rattenbury, Ma, and Raita (2012) discussed the conditioning principle of intermittent reinforcement from smartphones, facilitating a checking habit. This phenomenon interrupts work productivity even without audio or visual prompts. Markowetz's (2015) study in Germany, which applied classical conditioning principles to unconscious smartphone use, was cited by Weigend (2018), using Markowetz's research to warn society of digital burnout. In essence, Markowetz compared smartphone users to Pavlov's dog salivating at the sound of every bell (Weigend, 2018).

According to Asurion (2019), smartphone users checked smartphones without cues unconsciously at least every 18 minutes; this is about 80 times per day for the average user. Documented in a literature review by Brand, Young, and Laier (2014),

similar to brain images of people with Internet Addiction, visual and auditory notifications from smartphones lead to a dopamine response in the brain's pleasure center. Furthermore, this divided attention between phones and work is a form of multitasking. In a literature review, Chen and Yan (2016) identified 132 published studies researching the effects of multitasking with mobile phones and distraction. Chen and Yan (2016) stated that multitasking leads to greater errors and inefficiencies.

As managers have begun to deal with smartphone users at work, some have implemented regulations restricting cell phones in part or all of the work environment. A study conducted by Samaha and Hawi (2016) utilizing a sample of 364 students at Notre Dame University-Louaize, Lebanon, indicated the level of stress employees with nomophobia experienced when smartphones were out of reach. Samaha and Hawi (2016) found a higher amount of stress levels in these individuals. Higher levels of stress caused acute and chronic health problems and diminished the individual's productivity and the organization's productivity (Tams et al., 2018). Individuals experiencing nomophobia feel socially threatened when not connected, thereby raising stress levels (Tams et al., 2018; Yildirim & Correia, 2015).

Nomophobia was specifically addressed in a study by Aguilera-Manrique et al. (2018) utilizing a sample of 304 nursing students in Spain during a clinical practicum. Even though personal smartphones were restricted on the hospital floor, students with high nomophobia levels continued to use personal devices. Also, students were asked about opinions regarding smartphone restriction policies: 36.2% of nursing students indicated policies are necessary to restrict smartphone use by students at work, 28.6% of nursing students reported feeling uncomfortable when professional nurses used personal

smartphones during work, and 39.5% of nursing students felt policies restricting professional nurses from using smartphones are necessary (Aguilera-Manrique et al., 2018).

Smartphone restriction policies in the workplace raise the suggestion for managers to employ certain techniques to help reduce stress for employees prone to nomophobia. Communicating a specified window of time for meetings with employees reduces smartphone withdrawal by establishing a time limit. This strategy builds a sense of security (McKnight, Carter, Thatcher, & Clay, 2011). One final suggestion, but warranting further research, is that managers employ a sense of social context within meetings, thereby satisfying the employee with nomophobia's need for a social presence (Bragazzi & Del Puente, 2014). Tams et al. (2017) urged managers to understand the need for workers to control the work environment, thereby helping to moderate nomophobic symptoms in prone individuals.

Finally, according to Derks, Brummelhuis, Zecic, and Bakker (2014), organizations' expectations that employees respond to emails even after hours have disrupted the home-work balance. Zimmerle (2019) referred to this interruption in relationships as technoference. The pressure to respond to emails, whether at work or home, only strengthens the checking habit (Oulasvirta et al., 2012). These expectations also blur the work-family boundary, which is considered a cause of potential stress on the employee's social and family life (Zimmerle, 2019). There is no doubt that smartphones have been a positive influence in many areas of society. However, setting boundaries on being connected to the Internet is important to minimize both technoference and nomophobia at work and home (Zimmerle, 2019).

Nomophobia at home. The home arena has also changed due to smartphones (Twenge et al., 2018). Of course, enhanced communication with the family is one of the many positive aspects of devices, but research uncovered ramifications in the home when technology is overused (Twenge et al., 2018). The Nielsen Company (2018b) reported that adult screen-time averages around 11 hours per day in the U.S. Using a nationally representative sample of more than 2,300 parents, Lauricella et al. (2016) found that parents use screens for over nine hours per day. One-third of that time is spent on smartphones and, as self-reported, not fully focused on the child (Lauricella et al., 2016). Of course, some of this time is spent at work. However, according to McDaniel and Radesky (2018), parental attention is commonly divided between smartphones and children. McDaniel and Radesky (2018) studied phone use patterns in a sample of 183 couples with at least one newborn. The study results indicated that greater smartphone use in parents affected child behavior, which caused parents to withdraw more into smartphones. This creates a never-ending loop of negative parent-child interactions (McDaniel & Radesky, 2018). Because of this divided emotional engagement intensity, Ayyagari, Grover, and Purvis (2011) stated that parents might feel stressed, negative, and overloaded, thus decreasing emotional availability in family interactions. This is a lose-lose situation for children.

Millennials are the largest group of new parents in the year 2020, with the iGeneration just beginning to have children (Dimock, 2018). Technology has been available to these groups since youth. Certainly, families enjoy and can benefit from shared technology use (television watching or video game playing). However, smartphone use is not conducive to sharing time with others because smartphones are

designed as single-user devices (Dimcock, 2018). This technoference within relationships has been found to more likely disrupt or disturb parent-child time (Hiniker et al., 2015; McDaniel & Coyne, 2016; Radesky et al., 2016; Zimmerle, 2019). Since 2016, specific examples of this type of technoference are documented in research. For example, Radesky et al. (2016) utilizing a sample of 225 mother-child pairs found that 73% of parents admit phone use at a restaurant with children. Over a third of caregivers admitted, while at parks with children, to spending at least 25% of the time on phones as found by Hiniker et al. (2015) in a sample of 249 parent-child pairs across 40 different states. McDaniel and Coyne (2016), using an online survey completed by 143 married or cohabitating women, found over half of mothers believe technology is an intrusion during playtime. Zimmerle (2019) warned in a literature review that technoference associated with adult overuse of smartphones around very young children could have a long-term impact on children's social, emotional, and physical development. Swingle (2015) also pointed out that introducing technology during children's early years wreaks havoc on neurological development, parental attachments, and other social-emotional capacities.

Adults are more likely to use phones when bored, for instance during feedings or playtime (Golen & Ventura, 2015). As exemplified in a study by Golen and Ventura (2015) of mothers by asking for a diary of infant feeding patterns and smartphone use. After analyzing 209 diaries with a total of 1,181 recorded feedings, the results indicated boredom as one common predictor of smartphone overuse (Golen & Ventura, 2015). This distraction also may have serious physical ramifications. Utilizing data from the National Electronic Injury Surveillance System, Palsson (2014) found a significant number of parents identified concerns that technological distractions may be the

underlying cause of a higher number of children's injuries. Parents are not in the dark regarding these issues. Jiang (2018) noted that 36% of parents surveyed by the Pew Research Center (2018) admitted that phones took up too much time.

Newsham, Drouin, and McDaniel (2018) studied PMPU in a sample of 223 mothers of children under age five. Outcomes identified young mothers who have higher problematic usage of phones are at a greater risk of depressive symptomology. Radesky et al. (2016) in 35 conferences with parents of children under eight years of age, found adults use phones to escape stressors, which many times the stressors are the children. Unfortunately, this creates a cycle of unhealthy behavior because when parents withdraw from children and draw into phones, this creates more negative child behavior (McDaniel & Radesky, 2018). Also, Radesky et al. (2016) observed that parents respond harshly when children attempt to regain parent attention from the device, and some parents admitted to being very angry at a child for interrupting phone use.

A strong bond between parent and child is key to forming a secure attachment. In 1970, Ainsworth identified three attachment styles: secure, insecure-avoidant, and insecure ambivalent/resistant. In further literature analysis, Bretherton (1992) concluded these attachment styles coined by Ainsworth were the result of very early bonding between mother and child; especially as brain structures are developing in the early childhood months, the attachment bond is critical. Schore (2001, 2005) discussed how verbal communication with infants, including motherese or a sing-song voice, is critical to developing attachment. Also, non-verbal signals like eye contact, pleasant facial gestures, and caressing body language enhance attachment. Unfortunately, a low parent attachment may lead to a cycle of substitution of parental presence (often technology),

which reduces face-to-face socialization opportunities, communication practice, and the ability to regulate both behaviors and emotions (Porges, 2011). Hefner, Knop, Schmitt, and Vorderer (2019) studied a sample of 500 parent-child pairs. The results of this study indicated the importance of parent-child-communication and a positive, open relationship. In addition, Hefner et al. (2019) highlighted the detrimental effects a parent's PMPU has on a child's PMPU (Hefner et al., 2019). Vaala and Bleakley (2015), in a study involving 629 parent and adolescent pairs from the U.S., found that the pattern of parental device use is indicative of the adolescent's device use pattern. In short, parents act as models for children's device usage (Hefner et al., 2019; Vaala & Bleakley, 2015).

Before research focused on modern computers, iPads, or mobile devices, television (TV) was the first screen presented for study. Kirkorian, Pempek, Murphy, Schmidt, and Anderson (2009) studied background TV noise and parent engagement with 51 children under three years of age. Kirkorian et al. (2009) found that parent attention and involvement with children decreased by one-third when the television was turned on in the background. Furthermore, the time spent not interacting with the child increased by half. Just leaving a TV on in the background impacts interactions between parent and child, even when no one was actively viewing the TV (Kirkorian et al., 2009). Both Thompson (2009) in a review of literature on the self-regulation of young children, and Lally (2012) who advocated for society to focus on children under two to promote greater success in schools, feared that utilizing a smartphone during family activities may lead to limited attachment and ultimately affect a child's emotional well-being for the duration of life. Recently in an online study involving a sample of 245 participants, Eichenberg,

Schott, Decker, and Sindelar (2017) reported a relationship between adults at risk for Internet addiction and those adults identified as insecurely attached. There was no relationship found to Internet addiction in adults who were identified as securely attached.

In a literature review of self-control and Internet media use, Hofmann, Reinecke, and Meier (2017) discussed the phenomenon that new media in the beginning brings more benefits than concerns, but over-time there is a danger of activating addictive and impulsive behaviors. This cycle becomes apparent as children age. Parents are the primary models for behavior (Hofmann et al., 2017). The results of a study utilizing a sample of 448 parents of fourth to sixth-grade students by Hwang, Choi, Yum, and Jeong (2017) identified that smartphone addiction levels of parents determine how these adults mediate children's smartphone usage. Hwang et al. (2017) found that the more addicted parents are to smartphones, the less likely they are to be concerned with smartphone addiction severity. Furthermore, these parents were also less likely to see a child's use of a smartphone as a threat, whereby doing nothing to limit the child's usage (Hwang et al., 2017).

Self-help guidebooks written by medical doctors and psychologists are being published with an attempt to help parents through these new technological issues with children: *Be the Parent, Please: Stop Banning Seesaws and Start Banning Snapchat* (Riley, 2018), *Wired Child* (Freed, 2015), *Big Disconnect* (Steiner-Adair & Barker, 2014), and *Glow Kids* (Kadaras, 2016). Also, there are research-based, non-profit campaigns like *Wait Until 8th* (Wait Until 8th, 2020), where professionals urge parents not to give children a smartphone until at least eighth grade, hoping to mitigate some of

the negative effects which tend to go hand in hand with long-term smartphone ownership by children (Twenge et al., 2018).

Once children move into the teenage years, parent phone mediation patterns, or lack thereof, will likely have been set (Gezgin, Cakir, & Yildirim, 2018). A meta-analysis of empirical studies published between 1996-2006 on Internet addiction by Byun et al. (2009) identified these common factors found in young people: the Internet is used to distance from real-life issues, social conflict is prevalent, and loneliness is a self-described factor. Teenagers who cannot control Internet usage may experience addiction symptoms such as neglecting routine tasks and family members (Ko, Yen, Chen, Chen, & Yen, 2005).

Maras et al. (2015) in a study of 2,482 middle school and high school students from Canada, found an association with time on smartphones in youth is associated with sedentary lifestyles, higher body mass index, and an increased occurrence of compulsiveness, depression, and anxiety. Moreno-Guerrero, Aznar-Diaz, et al. (2020) identified that extensive smartphone usage actually affects the food choice of 12 to 20-year old's in a sample of 1,743 students from Spain. These negative outcomes add to the cycle of more loneliness and emotional issues, which in turn, circles back to more problematic usage (Ryu, Choi, Seo, & Nam, 2004). McDaniel and Coyne (2016) summed up that parents believe technology disrupts parenting and co-parenting decisions, thus interfering with their relationships with children and romantic partners.

Eichenberg et al. (2017) noted that very little research existed regarding the relationship between parents with high levels of nomophobia and offspring. Focus for future research may strive to determine if a stronger attachment a parent has to

smartphones is negatively correlated with the attachment bond with offspring. In short, many home-life areas: mental health, distracted driving, relationships with parents, children, partners, food, sleep, physical health, and fitness are viable areas for future nomophobia research.

Nomophobia at school. Nomophobia, dubbed the twenty-first century's phobia involving emotional factors like low self-esteem and other anxiety issues (Bhattacharya et al., 2019), is also found lurking quietly in today's schools. Singh, Gupta, and Garg (2013) suggested that developmentally, adolescents and young adults are especially at risk for addiction issues. Addiction and issues related to nomophobia are expected to increase in the future as phones become more powerful, available, unmonitored, and personalized (Han et al., 2017).

Anshari et al. (2016) suggested a strong correlation between a sample of 589 Bruneian students' nomophobia levels and Internet overuse. Anshari et al. (2016) found that nearly two-thirds of the sample used smartphones for more than six hours per day. Also, 46% of the sample reported: "they couldn't live without their smartphones" (Anshari et al., 2016, p. 725). In 2017, Davie and Hilber conducted a study on nomophobia with a sample of 104 students at South Westphalia University. Nomophobia was found to affect 100% of the student sample at some level (Davie & Hilber, 2017). Less than 3% of students met the criteria for severe nomophobia, but 40% had moderate nomophobia and the rest mild nomophobia. Davie and Hilber (2017) pointed out a concern for teachers utilizing mobile learning in classrooms: allowing students with nomophobia to use smartphones in class is like giving an alcoholic one drink with the expectation of stopping after just one drink (Davie & Hilber, 2017).

Kim (2013) conducted a study in South Korea involving a survey of middle and high school students' smartphone use. Out of 4,585 students, 6.51% used the phone excessively, and 1.81% were labeled as risky users: reported being unable to concentrate on schoolwork, experienced turmoil in friendships, exhibited psychological anxiety, and expressed feelings of loneliness without smartphone access. The findings showed that students with higher levels of nomophobia were unable to complete schoolwork without smartphones. Students reported intense levels of anxiety, loneliness, and trouble in interpersonal relationships. Hawi and Samaha (2016) found, in a study utilizing a sample of 364 students at Notre Dame University-Louaize, Lebanon, a significant correlation between students with higher levels of PMPU and a lower grade point average (GPA). With further inspection, multitasking was found to be partly responsible. Students' attention was divided between social networking and schoolwork (Hawi & Samaha, 2016).

Ahmed, Pokhrel, Roy, and Samuel (2019) found in a study of 157 physiotherapy students in India that higher levels of nomophobia indicated a significant negative impact on academics. Kuznekoff and Titsworth (2012) found, in a study conducted with 54 students at a large university in the Midwest that students in a lecture format class who were not engaged in actively using phones took an average of 62% more notes. Furthermore, in this same study (Kuznekoff & Titsworkth, 2012) found on a test, students not utilizing phones during the lecture earned significantly higher grades on average. In a similar study conducted by Mendoza, Pody, Lee, Kim, and McDonough (2018) at a small liberal arts university in Arkansas, 160 psychology undergraduates' attention was measured during a 20-minute lecture. Also, the NMP-Q survey was given to establish the

nomophobia levels of the participants. The outcomes indicated students who had access to smartphones scored lower on the quiz than those who did not have phones during the lecture. The students with higher levels of nomophobia scored lower on the quiz (Mendoza et al., 2018).

Students are not completely unaware of these issues of nomophobia interfering with schoolwork. McCoy (2013) surveyed a sample of 777 students from six colleges in the U.S. and found the average student used a mobile device for non-school related purposes over ten times for texting, emailing, or social networking during a normal school day. Respondents claimed to use smartphones to fight boredom, stay connected, or entertain; however, 80% agreed that these behaviors caused less attentiveness to important instruction. McCoy (2013) noted that most student respondents favored strict classroom policies thwarting digital distraction.

Studies on specific student groups have found nomophobic issues in users of many different types of classrooms: middle school, high school students, and college students (Darvishi, Noori, Nazer, Sheikholeslami, & Karimi, 2019; Davie & Hilber, 2017; Gezgin, Sumuer, Arslan, & Yildirim, 2017; McCoy, 2013). Gentina, Tang, and Dancoine (2018) conducted a study using a sample of 472 middle school students from an urban region of France. Researchers uncovered low levels Emotional Intelligence (a descriptor of self-esteem) as a link in the tendency to cheat at school with smartphones. Also, higher levels of Emotional Intelligence were found to have a negative relationship with nomophobia in this sample of middle school students (Gentina et al., 2018).

Cheever et al. (2014) conducted a study on nomophobia randomly assigning a sample of 163 university students from the U.S. into two groups. The control group was

allowed to keep smartphones, and the other group had smartphone access removed. Cheever et al. (2014) found that anxiety increased only in the students who reported heavy cell phone usage when the smartphone was unexpectedly taken away. Davie and Hilber (2017) and Sing et al. (2013) reported agreement with the results of a study by Cheever et al. (2017) who found that the more smartphones were utilized, the more nomophobic issues were reported.

As stated, the majority of studies on nomophobia have focused mostly on college students or adolescents. Several researchers conducted studies on nomophobia and soon to be professionals. The results of a study by Bartwal and Nath (2019) using a sample of 451 medical undergraduates from northern India, indicated 100% of medical students reported some level of nomophobia: 15.5% mild, 67.2% moderate, 17.3% severe. Darvishi et al. (2019) found out of 100 medical science undergraduate students surveyed from Islami Azad University in Tehran, the incidence of nomophobia was significantly lower in younger females. Dasgupta et al. (2017), in a study utilizing 303 medical undergraduates and 305 engineering undergraduates, found 44.6% of engineering students surveyed were significantly nomophobic, as opposed to only 42.6% of medical students. Farooqui, Pore, and Gothankar. (2018) found in a sample of 145 medical students, 100% reported some level of nomophobia; specifically, 82.1% reported moderate to severe levels of nomophobia.

Gezgin et al. (2017) found in a study using a sample of 818 Turkish pre-service teachers, levels of nomophobia were higher than average college students. Gutierrez-Puertas et al. (2019) conducted an observational study of 258 nursing students from Spain and Portugal. Both groups from Spain and Portugal were found to be significantly

nomophobic. Also, researchers noted that younger students were significantly more nomophobic than older students (Gutierrez-Puertas et al., 2019).

A study by Prasad et al. (2017) utilized a sample of 588 dental students from India. Results indicated a 24.12% prevalence of nomophobia in the sample. All students were volunteer participants and the study gives a good overview of nomophobia from dental students' perspectives (Prasad et al., 2017).

Nomophobia concerns regarding school have previously focused only on students. Future research opportunities will be to map the course of nomophobia academically, socially, and emotionally for all stakeholders in schools. Bragazzi and Del Puente (2014) summed up the concerns in a proposal for formal clinical criteria to be included in the *DSM-V*:

> To a certain extent, it is not an exaggeration to say that using new technologies is a cognitively challenging task that calls upon adequate data processing, willingness to change and accept new devices, and adequate personality traits such as technology enthusiasm and readiness. However, these new technologies, characterized by the absence of face-to-face communication, can also interfere with social interactions, causing disturbing behaviors and bad feelings, leading to social isolation, a certain degree of alienation, economic/financial problems. (para. 8)

Nomophobia is of concern at school because the impact is felt in both the mental health arena and the educational arena. Gezgin et al. (2018) concluded after a nomophobia study utilizing a sample of 929 high school students from Turkey: "Teachers and families must pay attention to the excessive use of mobile Internet . . . educational

seminars must be given at schools and solutions need to be proposed . . . in order to fight against the prevalence of nomophobia, which is considered as one of the key technology-related problems of the coming age" (p. 222).

The Demographics of Gender and Age

Gender and age are two commonly identified demographics used in research. However, one must understand that in 2021, smartphones have been available for only fourteen years. Therefore, the generation gap of people who have spent the majority of life without a smartphone, and people who have always used smartphones, is an important aspect of comprehending smartphone addiction. Also, understanding the history of why different genders utilize smartphones is also pertinent in understanding smartphone addiction and the next steps of how to mitigate the issue.

Gender. The discussion of gender related to smartphone use is important to begin with early research on Internet usage. Weiser (2000) utilizing a sample of 506 students at Texas Tech University found the Internet usage gender gap was shrinking at that point. "Results showed that males use the Internet mainly for purposes related to entertainment and leisure, whereas women use it primarily for interpersonal communication and educational assistance" (p. 167). However, as was noted in the study, the comfort level with accessing the Internet played a large part in how the Web was used by both genders (Weiser, 2000). Specifically, the study conducted by Wesier (2000) showed that significantly more females utilized the Internet for all forms of interpersonal communication and information gathering in the year 2000. Males, at that time, used the Internet for gaming, entertainment, shopping, searching for romance, and sex-related information (Weiser, 2000).

In five short years, researchers narrowed the focus on gender and cell phone usage. Bianchi and Phillips (2005) and Lemish and Cohen (2005) studied gender differences in PMPU and young adults. These researchers observed that mobile phone usage was more gender-neutral. However, Geser (2006) claimed that females utilized cell phones more socially than males who used cellphones as a tool or an instrument from a sociological perspective of cell phone usage in society. It is important to note, in 2006 cell phones did not have access to the Internet.

Smartphones with Internet capability and social media platforms in one's pocket, as discussed previously, were released in 2007 (Sanford, 2020). A study by Junco, Merson, and Salter (2010) utilized a sample of 4,491 college students from four major universities in the U.S. to research demographic information and personal technology devices. No difference was found between the genders and how smartphones were being used (Junco et al., 2010). Roberts, Yaya, and Manolis' (2014) goal was to identify which smartphone services were more apt to be linked with smartphone addiction by male and female users. Roberts et al. (2014) utilized a sample of 164 college undergraduates from Baylor University in Texas and found that preferred cell phone activities varied across male and female users. However, Roberts et al. (2014) identified that both females and males used smartphones equally in social situations. In a Turkish study of students between the ages of twelve and eighteen, gender was declared the third-best demographic predictor of smartphone addiction (Durak, 2018). This particular study also found that adolescent males had higher smartphone addiction levels than females (Durak, 2018). Anshari et al. (2016) noted in a study with a sample of 589 young adults from a college in Brunei that females are more apt to use social platforms and instant messaging

applications than males; however, in this study, undergraduate males were found to clock more hours on smartphones than undergraduate females. Taywade and Khubalkar (2019) found in a study using a sample of 300 Indian adolescents that females and males have significantly different smartphone usage patterns and noted that females are more at risk of PMPU because of significantly more time spent on phones than males. As one can see, the results of gender regarding smartphone addiction is mixed.

Gender research regarding nomophobia is a more recent area of study. In a literature review of studies on nomophobia, Rodriguez-Garcia, Moreno-Guerrero, and Lopez Belmonte (2020) reported only five nomophobia studies specifically found differences concerning gender. However, five more studies were located. The following ten studies reported females consistently indicated higher levels of nomophobia. These studies are discussed alphabetically by author (Aguilera-Manrique et al., 2018; Ak & Yildirim, 2018; Arpaci, Baloglu, & Kesici, 2019; Arpaci, Baloglu, Kozan, & Kesici, 2017; Dasgupta et al., 2017; Gezgin et al., 2018; Gezgin et al., 2017; Moreno-Guerrero, Aznar-Diaz, et al., 2020; Prasad et al., 2017; Yildirim, Sumuer, Adnan, & Yildirim, 2016).

A study by Aguilera-Manrique et al. (2018) utilizing a sample of 304 nursing students in Spain found a significant difference in female students' levels of nomophobia than male students. Also, Ak and Yildirim (2018) studied gender specifically and the four underlying factors of nomophobia identified by Yildirim (2014): a) fear of being unable to communicate, b) fear of losing connectedness, c) fear of being unable to access information, d) fear of losing convenience. Ak and Yildirim (2018) found that females had a significantly higher fear of being unable to communicate and the fear of losing

convenience than males. Arpaci et al. (2017) studied mindfulness and nomophobia in Turkish college students. Arpaci et al. (2017) stated that females scored significantly higher in nomophobia, but gender differences regarding mindfulness were not a significant factor. However, in a follow-up study utilizing a sample of 491 Turkish university students, Arpaci et al. (2019) identified that mindfulness-based therapy approaches were effective for both males and females. A study by Dasgupta et al. (2017) utilized a sample of 303 medical students and 305 engineering students from India; both groups indicated a higher level of female respondents' nomophobia. Gezgin et al. (2018) studied nomophobia in a sample of 929 high school students in Turkey. Results found that female students tend to report higher scores of nomophobic behavior. The longer smartphone ownership was correlated with higher levels of nomophobia (Gezgin et al., 2018). In a study using a sample of 818 pre-service teachers from Turkey, Gezgin et al. (2017) found higher levels of nomophobia in females than males. Moreno-Guerrero, Aznar-Diaz, et al. (2020) utilized a sample of 1,743 students 12 to 20-years of age from Spain and found that females showed higher levels of nomophobia when faced with the fear of being unable to communicate by use of a smartphone. Prasad et al. (2017) utilized a sample of 588 dental students from India. Results indicated a 24.12% prevalence of nomophobia. Also, the prevalence of nomophobia was significantly higher for female students (Prasad et al., 2017). Yildirim et al. (2016) found that gender affected levels of nomophobia in the sample of 537 Turkish college students. Females demonstrated significantly higher levels of nomophobic behaviors (Yildirim et al., 2016).

The results of five other nomophobia studies indicated no gender differences. Adnan and Gezgin (2016) studied a sample of 433 Turkish college students and found

nomophobia in students above moderate levels, but no gender differences were indicated in the study. Al-Balhan, Khabbache, Watfa, Re, Zerbetto, and Bragazzi (2018) studied a sample of 512 adolescents and young adults from Kuwait. Researchers reported no gender differences linked to nomophobic behaviors (Al-Balhan et al., 2018). Argumosa-Villar, Boada-Grau, and Vigil-Colet (2017) looked at many different nomophobia predictors in a study using 242 Spanish students. Argumosa-Villar et al. (2017) found gender to have no substantial disparity. In a study utilizing a sample of 200 students in India, Dixit et al. (2010) found 19% of males and 18% of females reported significant nomophobia levels. Researchers concluded no statistically related differences concerning gender (Dixit et al., 2010). A study utilizing a sample of 145 first-year medical students was conducted by Farooqui et al. (2018). Although 100% of students were found to have some level of nomophobia, no significant gender differences were found (Farooqui et al., 2018).

The results of the following three studies indicated that males have somewhat higher levels of nomophobia than females. Darvishi et al. (2019) found in a sample 100 medical science undergraduate students surveyed from Islami Azad University in Tehran, nomophobia was significantly lower in females (Darvishi et al., 2019). Ozdemir, Cakir, and Hussain (2018) studied Turkish and Pakistani university students and concluded that male Turkish students reported higher nomophobic behavior. However, there was no difference in nomophobia levels between female and male Pakistani students. Davie and Hilber (2017) surveyed a sample of 104 university students and found that females were somewhat less likely to be nomophobic than males; however, no statistically significant results were reported in this study.

Therefore, the research focused on gender, and nomophobia leans slightly toward females having more nomophobic tendencies. However, there are still inconsistencies in the literature. Research into nomophobia is relatively new, and gender is just one of the variables studied simultaneously with other variables such as age.

Age. The average age of smartphone users has decreased over the last decade; also, 77% of adults report ownership of a smartphone (Pew Research Center, 2018). In 2011, only 35% of adults reported smartphone ownership. Pew Research Center (2018) stated that 92% of adults under 30 own a smartphone, compared with 42% of adults 65 and older. The trend of popularity of mobile devices over ten years is visually depicted in Figure 1 below (Meeker, 2018, p. 11).

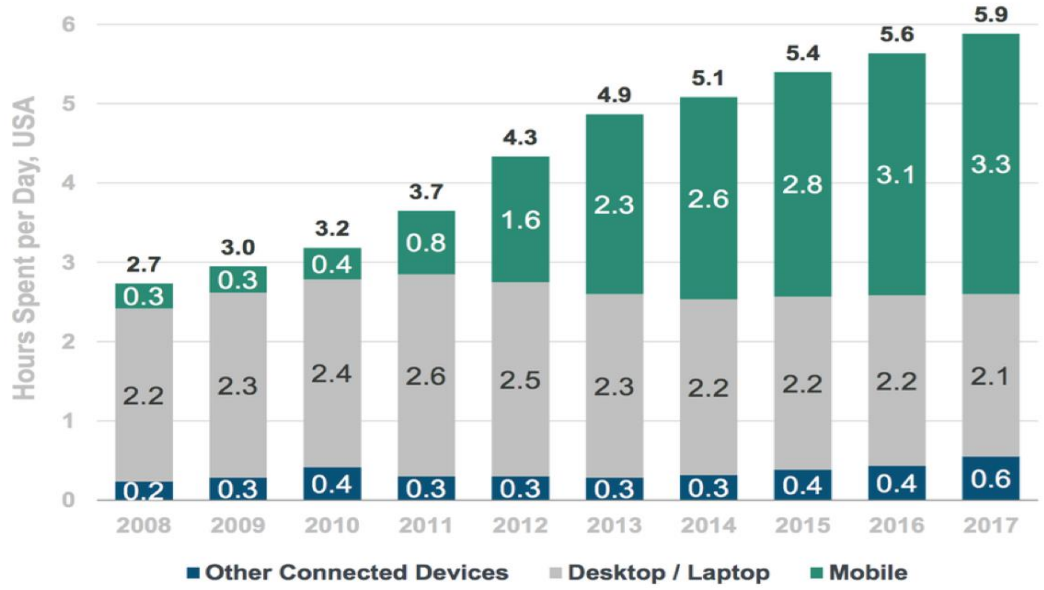

Figure 1. Daily hours spent with digital media per adult user. Adapted from "Internet Trends 2018" by M. Meeker, p. 11. Retrieved Dec. 23, 2019, from https://www.kleinerperkins.com/perspectives/internet-trends-report-2018/. Copyright 2018, by Kleiner Perkins.

An extensive amount of literature on problematic use of technology has been focused on adolescents because the prevalence of any addiction beginning as a teen typically continues as an adult (Coffey, Carlin, Lynskey, Li, & Patton, 2003). Liu et al. (2009) and Wallace (2014) stated that focusing on adolescents and emerging adults is important to determine how problematic Internet usage affects all age groups. Discussing literature that specifically encompasses a span of age groups is most pertinent to this current study. For example, results from a Lebanese study utilizing a sample of 207 adults of all ages by Nahas, Hlais, Saberian, and Antoun (2018) indicated 20.5% of the sample reported problematic use of smartphones. Specifically, PMPU found in older adults ages 35 to 64 was 12.5%. PMPU was 27% among younger adults ages 18 to 34 whose most reported reasons for using smartphones were social reasons (Nahas et al.,

2018). According to the Pew Research Center (2019), only 10% of American adults (typically ages 65 and older) are offline.

De-Sola, Talledo, Rubio, and de Fonseca (2017) and Kwon, Yoon, Noh, Chun, and Han (2017) studied age as a predictor of smartphone use problems. De-Sola et al. (2017) studied a sample of 1,126 people ages 16 to 65 from Spain and found the age groups specifically at risk for problematic smartphone usage were the 16 to 26-year-old and 26 to 35-year-old groups. Kwon et al. (2017) studied a sample of 1,000 adults 19 to 60 years of age in Tokyo and concurred the ages most at risk for both prevalence and the problematic use of smartphones were between 16 and 35 years old. Also, both studies indicated that age was a predictor of smartphone problematic usage (De-Sola et al., 2017; Kwon et al., 2017).

When discussing age as a predictor of problematic usage, one must first understand digital natives as conceived by Prensky (2001): the age group born after 1980 with an innate ability to master technology easier and faster than those born before 1980. Although this concept has been criticized, understanding the technology gap between someone born in a time period where the Internet is available at all times, and someone who grew up carrying a dime in order to use a payphone, is important to keep in mind when discussing age groups struggling with PMPU, smartphone addiction, and nomophobia.

Csibi, Griffiths, Demetrovics, and Szabo (2019) found in an online study of 1,651 people from age 3 to 69 years old that adults ages 20 to 34 scored the highest for PMPU, followed by the 3 to 11-year-old children's group. Csibi et al. (2019) concluded:

> Problematic smartphone use appears to have specific patterns according to age, with dominance of salience, mood modification and conflict in childhood, tolerance, withdrawal symptoms, and relapse in adulthood. Some age groups appear to be at greater risk for problematic smartphone use, so prevention should focus on these ages. (Conclusion section, para. 1)

Csibi et al. (2019) also noted that the oldest age group's problematic smartphone usage scores were the least concerning. Based on a study utilizing a sample of 386 participants ages 15 to 88, Van Deursen, Bolle, Hegner, and Kommers (2015) stated, "Age negatively affects process and social usage, and social stress. There is a positive effect on self-regulation. Older people are therefore less likely to develop habitual or addictive smartphone behaviors" (p. 411). Moreno-Guerrero, Aznar-Diaz, et al. (2020) focused on age in a study of nomophobia and poor diet utilizing a sample of 1,743 students age 12 to 20-years old. Researchers found students ages 15 to 20-years old were more at risk for nomophobia than those over the age of 20 and thus more susceptible to future health problems due to negative food choice habits formed at a younger age (Moreno-Guerrero, Aznar-Diaz, et al., 2020).

The effect of users' ages on nomophobia has been cited in recent studies as an independent variable. SecurEnvoy (2012) surveyed 1,000 employed people in the UK and found nomophobic behaviors reported by participants between the ages of 18 to 24 were significantly higher than the 24 to 34-year old group. Gutierrez-Puertas et al. (2019) studied a sample of 258 nursing students from Spain and Portugal. Researchers noted that younger students were significantly more nomophobic (Gutierrez-Puertas et al., 2019). Dasgupta et al. (2017) utilized a sample of 303 medical undergraduates and

305 engineering undergraduates in India. Engineering students reported significantly higher levels of nomophobia than medical students. Also, being a student age 21 and younger was identified as a significant predictor of nomophobia (Dasgupta et al., 2017). Darvishi et al. (2019) studied a sample of 100 medical students in Tehran. Searching specifically for indicators of nomophobia and age: "Participants with lower mean age felt more discomfort, anger, anxiety, and insecurity due to lack of access to mobile phones and other related issues compared to other people" (p. 573). Musa, Saidon, and Rahman's (2017) utilized a sample of 272 young (early to mid-twenties) and mature groups (early to mid-thirties) of Millennials to study age as a predictor of nomophobia. Researchers found the Millennials' younger group was more likely to develop nomophobia than the Millennials' more mature group (Musa et al., 2017). The following researchers agree that smartphone use in younger users is a predictor of nomophobia: Dasgupta et al. (2017), Darvishi et al. (2019), and Musa et al. (2017).

Gezgin et al. (2017) and Moreno-Guerrero, Lopez-Belmonte, et al. (2020) utilized samples of pre-service teachers. The sample used by Gezgin et al. (2017) was comprised of 818 Turkish students, and the sample used by Moreno-Guerrero, Lopez-Belmonte, et al. (2020) was comprised of 849 Spanish students. Gezgin et al. (2017) and Moreno-Guerrero, Lopez-Belmonte, et al. (2020) both noted that as the mean age of pre-service teachers decreases, reported levels of nomophobia increases, thus concluding that the youngest (below age 20) pre-service teachers have the highest mean level of nomophobia.

Research regarding age as a predictor of nomophobia has followed the same trend as research regarding age and PMPU previously discussed (Cheever, Rosen, Carrier, &

Chavez, 2014; Sanchez-Martinez & Otero, 2009; Walsh, White & Young, 2010. The younger age groups, or digital natives, appear to be more at risk for nomophobia than older age groups. Argumosa-Villar et al. (2017) suggested "the main explanation of previous findings is that younger users are the newest mobile phone customers and the most vulnerable because they do not yet have full control of their impulses" (p. 132). Expecting to find age a predictive factor in a study using a sample of 242 Spanish students, Argumosa-Villar et al. (2017) found nomophobia prevalent among all age groups. According to Gezgin et al. (2018), nomophobic behaviors of 929 high school students from Izmir and Edirne were above average. Results indicated that the earlier students began using smartphones, the higher the risk of addiction and nomophobia (Gezgin et al., 2018). Future researchers may wish to continue to document nomophobia measurements as digital natives age to identify levels of nomophobia, because of the nature of the age group (adolescence and young adults) or the influence of other variables such as how long a person has owned or used a smartphone.

The Nomophobia Questionnaire (NMP-Q)

The NMP-Q was originally developed in a pilot study by Yildirim (2014) as a graduate thesis and further validated by Yildirim and Correia (2015). The NMP-Q is a survey containing 20 statements requiring a response using a seven-point Likert-type scale. Yildirim and Correia (2015) identified and validated the four underlying factors of nomophobia: a) fear of being unable to communicate, b) fear of losing connectedness, c) fear of being unable to access information, d) fear of losing convenience.

The NMP-Q is currently available in six different languages. This instrument was first translated and validated into the Turkish language by Yildirim et al. (2016). In 2016

and 2017, the NMP-Q was translated and validated in the Spanish language by two separate research groups (Gutierrez-Puertas, Marquez-Hernandez, & Aguilera-Manrique, 2016; Ramos-Soler, Lopez-Sanchez, & Quiles-Soler, 2017). Next, the NMP-Q was translated and validated from the English language to Italian in 2018 (Adawi et al., 2018). In 2018, the Persian version was translated and validated in the Arabic language (Al-Balhan et al., 2018). Also in 2018, the NMP-Q was translated into the Chinese language (Ma & Liu, 2018).

In a 2020 literature review of 142 articles, Rodriguez-Garcia et al. (2020) found the NMP-Q developed in 2014 by Yildirim was the most widely used instrument in nomophobia research. At the time of this current study, the NMP-Q had been used in nineteen published studies (Adawi et al., 2018; Aguilera-Manrique et al., 2018; Ahmed et al., 2019; Al-Balhan et al., 2018; Bartwal & Nath, 2019; Bragazzi et al., 2019; Dasgupta et al., 2017; Farooqui et al., 2018; Gonzalez-Cabrera, Leon-Mejia, Perez-Sancho & Calvete, 2017; Gutierrez-Puertas et al., 2016; Gutierrez-Puertas et al., 2019; Lee, Kim, McDonough, Mendoza, & Kim, 2017; Lin, Griffiths & Pakpour, 2018; Mendoza et al., 2018; Moreno-Guerrero, Lopez-Belmonte, et al. (2020); Prasad et al., 2017; Ramos-Soler et al., 2017; Yildirim & Correia, 2015; Yildirim et al., 2016). A discussion of studies follows in chronological order by date published in order to clearly discern the timeline of results indicated by the analysis of results from the NMP-Q.

Yildirim (2014) first developed the NMP-Q for graduate thesis work at Iowa State University utilizing a sample of nine undergraduate students in a mixed methods study. In order to bring more credibility to the NMP-Q, Yildirim and Correia (2015) utilized a mixed-methods study utilizing a sample of 301 undergraduates from a large Midwestern

university. Yildirim and Correia (2015) validated the NMP-Q and identified the four underlying factors of nomophobia discussed previously. Also, Yildirim and Correia (2015) identified threshold levels of nomophobia as evidenced by NMP-Q cut-off scores: a NMP-Q score of 20 and below demonstrates an absence of nomophobia, a NMP-Q score between 21-59 demonstrates mild nomophobia, a NMP-Q score between 60-99 demonstrates moderate nomophobia, and a NMP-Q score of 100 and above demonstrates severe nomophobia. Based on the reliability analysis, the study demonstrated the NMP-Q generates true and reliable scores of nomophobia. Furthermore, based on the correlation of the NMP-Q scores and the Mobile Phone Involvement Questionnaire (MPIQ), which was previously established as a valid instrument, Yildirim and Correia (2015) suggested scores generated by the NMP-Q are valid.

Yildirim et al. (2016) validated and translated the NMP-Q into Turkish. The Turkish translation was found to be both reliable and valid. The main study involved the Turkish version of the NMP-Q and sample of 537 college students from Turkey. The prevalence of nomophobia in Turkish students was 42.6%. Researchers also analyzed the four underlying factors of nomophobia. The greatest fears identified in the sample were being unable to communicate and being unable to access information. Yildirim et al. (2016) found no age difference in nomophobic behaviors. However, the sample age groups were homogeneous. However, females reported higher nomophobia scores than males overall. Also, the duration of smartphone ownership was analyzed. Results indicated less nomophobic behaviors reported by students who owned a smartphone for less than two years, as opposed to higher levels of nomophobia in those owning smartphones for over two years. Yildirim et al. (2016) called for “the need for future

research in this area to identify the risk groups and establish protection strategies" (p. 1328).

Gutierrez-Puertas et al. (2016) translated and validated the Spanish version of the NMP-Q utilizing a sample of 65 nursing students from Spain. The back-translation process was performed with 20 linguistic experts to ensure appropriate cultural adaptation of the version. The outcome was found to have solid internal consistency compared to the original questionnaire with a Cronbach's alpha value of .928. Gutierrez-Puertas et al. (2016) aimed to create a tool to facilitate the proper diagnosis of nomophobic behaviors linked to mobile phone addiction for the Spanish-speaking population.

Ramos-Soler et al. (2017) adapted and validated another Spanish version of the NMP-Q. Experts in the field were used to adapt the scale linguistically and in a culturally appropriate manner. The sample utilized was comprised of 372 students studying to be teachers in Spain. The research results are only available in Spanish; however, the abstract, available in English, confirms the validation of this Spanish version of the NMP-Q (Ramos-Soler et al., 2017).

West Bengal was the setting for a study conducted by Dasgupta et al. (2017) involving a sample of 303 medical undergraduates and 305 engineering undergraduates. The objective was to analyze the difference in nomophobic levels and behaviors between medical and engineering students. Furthermore, researchers sought to identify any possible predictors related to PMPU. Dasgupta et al. (2017) found that 44.6% of engineering students surveyed were significantly nomophobic, as opposed to only 42.6% of medical students surveyed. Engineering students scored significantly higher than

medical students in three out of four underlying factors of nomophobia (no difference was found in the factor dealing with the fear of being unable to communicate). Both groups reported the highest mean scores regarding the fear of being unable to access information. Dasgupta et al. (2017) identified several possible predictors of nomophobia for both groups: under 21 years of age, not owning other gadgets, owning a smartphone more than two years, phone use of over four hours per day, limitless mobile data, greater monthly phone bill, and female.

Research conducted by Gonzalez-Cabrera et al. (2017) involved the use of a sample of 306 students 13 to 19 years old. Utilizing a Spanish version of the NMP-Q and the previously validated Mobile Phone Problem Use Scale, research determined the Spanish version of the NMP-Q was reliable in the study of nomophobia. Gonzalez-Cabrera et al. (2017) identified that 14.4% of students surveyed were mildly nomophobic, 66.4% were moderately nomophobic, and 4.6% severely nomophobic. Only 14.6% of students surveyed indicated an absence of nomophobia. Gonzalez-Cabrera et al. (2017) warned that nomophobia could greatly impact students' lives, even blossoming into a major mental disorder over time.

Lee et al. (2017) utilized a sample of 160 psychology students from a small college in Arkansas. All participants were exposed to a videotaped lecture and randomly divided into four groups: "Group 1 (cell phone possession and use permitted, Group 2 (cell phone possession permitted but cannot use), Group 3 (complete removal of cell phones from participants' possession), and a Control Group (no instruction on cell phone use)" (Participants section, para. 1). During the lecture, four distracting messages were sent to students who were allowed to have phones. Several assessments were given after

the lecture, including a class quiz over the material and the NMP-Q. Results showed the group without cell phones performed the highest on the quiz after the lecture. The student group granted cell phone possession, but not allowed to use the phones scored as low as the group granted permission to use cell phones. Results showed "individual differences in obsessiveness, nomophobia, and mindful awareness did not predict or moderate test performance" (Discussion section, para. 4). Lee et al. (2017) suggested the results of this study indicated a need for strict classroom cell phone restrictions.

Dental students from India were the subjects in a study conducted by Prasad et al. (2017). The NMP-Q was administered along with demographic questions and mobile phone ownership questions to a sample of 588 dental students. Results indicated a 24.12% prevalence of nomophobia in the sample. Also, the prevalence of nomophobia was significantly higher for female students. Also, 39.5% of students believed spending too much time on phones directly related to poor academic performance. Prasad et al. (2017) advocated strict policies to remove cell phones during clinical work.

Adawi et al. (2018) translated the NMP-Q into the Italian language and validated the translation using a sample of 403 Italian students. The respondents were required to complete the NMP-Q and track smartphone hourly usage. The hours spent on smartphones directly influenced the levels of nomophobia according to the NMP-Q (Italian version). An exploratory factor analysis was conducted. The NMP-Q showed an overall Cronbach alpha coefficient of 0.95. The conclusion was that the Italian version of the NMP-Q was reliable. Also, Adawi et al. (2018) warned that more time spent on phones predicted higher nomophobia levels.

Aguilera-Manrique et al. (2018) sought to find a relationship between nomophobia and distraction. The survey involving a sample of 304 nursing students from the University of Almeria utilized the NMP-Q to measure nomophobia and self-reported indicators of distractions by smartphones during clinical practicum hours. Results indicated a relationship between smartphone use and nomophobia. In addition, results indicated a significant gender difference: female nursing students reported significantly higher nomophobia levels than male nursing students. Aguilera-Manrique et al. (2018) asked the sample of nursing students about smartphone restriction policies: 36.2% indicated policies were necessary restricting smartphone use by students at work, 28.6% reported feeling uncomfortable when professional nurses used personal smartphones during work, and 39.5% felt policies restricting professional nurses from using smartphones were necessary.

Al-Balhan et al. (2018) developed and validated the Arabic version of the NMP-Q. A total sample of 512 adolescents and young adults volunteered for the study to measure levels of nomophobia. Al-Balhan et al. (2018) found no significant differences in gender and nomophobia. Both confirmatory and exploratory factor analysis were used to validate the Arabic version. Results indicated nomophobia to be "quite widespread among adolescents and young adults in Kuwait" (Discussion section, para. 1). The prevalence of severe nomophobia in the participants was 22.2% which was similar to previous studies (Al-Balhan et al., 2018).

An observational study utilizing a sample of 145 first-year medical students was conducted by Farooqui et al. (2018). The goal was to determine the prevalence of nomophobia in participants. Researchers identified 100% of students reported some level

of nomophobia; however, 82.1% reported moderate to severe levels of nomophobia. No significant gender differences were identified in this study (Farooqui et al., 2018).

Lin et al. (2018) confirmed the construct validity of the Persian NMP-Q for adolescents. Rasch models and confirmatory factor analysis were used to validate each factor answered by 3,216 students ages 13 to 19 from Iran. Gender was analyzed. It was determined both males and females interpreted the Persian version similarly. Lin et al. (2018) concluded that the Persian version of the NMP-Q was an accurate measurement for Iranian adolescents, and both genders understood each item in a similar fashion.

Mendoza et al. (2018) conducted a study regarding nomophobia and learning utilizing a sample of 160 university students in Arkansas. Participants formed four groups and each group attended a video lecture. One group was allowed to use smartphones, one group was allowed to keep smartphones in silent mode, one group was not allowed to have smartphones, and one group served as a control group. A barrage of distracting messages was sent during the lecture to the smartphone holding group. A quiz was given after the lecture; questions were divided into sections based on material presented at different times throughout the lecture. Also, the NMP-Q was given to assess students' levels of nomophobia. Results showed that students who had access to phones performed worse than those who did not have a phone. This groups' poor performance was specifically related to material provided 10-15 minutes into the lecture. Additionally, high scores on the NMP-Q indicated poor quiz scores related to the material presented 10-15 minutes into the lecture. "The effects of having a cellphone, being distracted by a cellphone, and nomophobia consistently impacted quiz performance"

(Mendoza et al., 2018, p. 58). Also, Mendoza et al. (2018) found that the fear of losing connectedness was of deepest concern for participants.

Ahmed et al. (2019) researched nomophobia as reported by a sample of 153 students enrolled in a physiotherapy program at a university in India. The prevalence of nomophobia, as reported by the NMP-Q score, was 77.6%. Furthermore, an inverse relationship between the students' nomophobia score and academic performance was identified. Ahmed et al. (2019) also identified that 54% of students reported having musculoskeletal problems. These pains were located in the students' neck, wrists, and back reportedly due to smartphone overuse (Ahmed et al., 2019).

A cross-sectional study was conducted by Bartwal and Nath (2019) using a sample of 451 medical undergraduates from northern India. Using the NMP-Q, all 451 students reported some level of nomophobia: 15.5% mild, 67.2% moderate, 17.3% severe. Bartwal and Nath (2019) indicated that nomophobia is a serious concern in medical students and advocates for increased awareness of smartphone addiction concerns.

Using the Italian version of the NMP-Q and Brief COPE Questionnaire, which measures coping styles of subjects, Bragazzi et al. (2019) conducted an online survey of 403 adolescents and young adults in Italy. When confronted with stress, subjects with higher levels of nomophobia responded with behavioral disengagement, denial, self-blame, self-distraction, venting, and use of both emotional and instrumental support. Bragazzi et al. (2019) concluded that those respondents with significant levels of nomophobia respond with maladaptive coping strategies when under duress. Findings

indicated proactive interventions are necessary to aid individuals prone to nomophobia in more appropriate reactions to stress (Bragazzi et al., 2019).

Gutierrez-Puertas et al. (2019) conducted an observational study utilizing a sample of 258 nursing students from Spain and Portugal. Nursing students from both countries scored higher than average on nomophobia. Nonetheless, nursing students from Portugal scored higher in anxiety and felt a greater need to stay in communication with family members than those nursing students from Spain. Gutierrez-Puertas et al. (2019) highlighted the quality of care concerns in clinical practice due to distractions caused by smartphones.

Moreno-Guerrero, Lopez-Belmonte, et al. (2020) studied a sample of 849 students enrolled in teaching programs at three different universities in Spain. All participants were enrolled in the Early Childhood Education or Elementary Education programs. Moreno-Guerrero, Lopez-Belmonte, et al. (2020) concluded that the next generation of teachers are moderately at risk of nomophobia. One area showing an elevated concern for future teachers was the fear of being unable to communicate. Also, 53.4% of future teachers believe that smartphone use affects sleeping hours. Moreno-Guerrero, Lopez-Belmonte, et al. (2020) called for teacher training and prevention programs to ensure when teachers are in charge of students, the issues of nomophobia do not cause significant problems in the classroom.

Although nomophobia was described by Dixit et al. (2010) as an emerging dilemma, research interest in the area has grown exponentially. Most of the studies detailed above were conducted in the last three years. The NMP-Q has been the

instrument of choice to create a complete picture regarding this growing problem called nomophobia (Rodriguez-Garcia et al., 2020).

Summary

Chapter 2 included the analysis of the relevant literature related to Internet overuse issues, PMPU, and nomophobia. First, an overview of the literature was explained regarding media ecology and how that relates to modern technological issues. Next a brief history of Internet technology detailed the literature regarding overuse, addiction, and PMPU. A discussion followed regarding Maslow's hierarchy of needs and how smartphone misuse is connected to human motivation and basic needs. Next, the literature regarding nomophobia was explained, including the four underlying factors of nomophobia relating to home, work, and school. Gender and age of users were then discussed regarding Internet Addiction, PMPU, and nomophobia concerns. Finally, the history and the research literature concerning the NMP-Q survey was presented. Chapter 3 includes an explanation of the research design, sample, hypotheses, limitations, data collection procedures, and statistical analyses related to the current study.

Chapter 3

Methods

The purpose of this study was to determine the extent to which teachers in a private school setting experience nomophobia. A second purpose was to identify which teachers may be more at risk of higher levels of nomophobia dependent upon gender, age, and school-level taught. Presented in Chapter 3 are the methods utilized to gather the data and test the research hypotheses. This chapter is organized accordingly: research design, selection of participants, measurement, data collection procedures, data analysis and hypothesis testing, and the limitations of the study.

Research Design

A quantitative research design guided this study. A non-experimental design utilizing a survey was used**.** Professional teachers in private schools across two states completed the NMP-Q survey to determine the extent of nomophobia. The dependent variable was teachers' self-reported levels of nomophobia as derived from answers on the NMP-Q survey. Independent variables for this study included the teachers' gender (female, male), age (18 through 25, 26 through 35, 36 through 50, 51 plus), and school-level taught (early childhood, elementary school, middle school, high school).

Selection of Participants

Purposive sampling is a selection of participants based on a researcher's own familiarity with a group (Lunenburg & Irby, 2008). The sample selected for this research was early childhood through 12th-grade teachers employed at Kansas and Missouri private schools accredited by the ISACS (see Appendix A for permission to use name). Table 1 below depicts the 12 ISACS accredited schools whose teachers were invited to

participate in the current study (see Appendix B for petition to participate and Appendix C for response emails). Included in Table 1 are the locations, enrollment, grade levels taught, and the number of faculty employed at the schools. The common denominator for the private schools was the accreditation by ISACS. However, the schools were diverse, including a wide range of locations and school models (boarding schools, day schools, military, co-ed, and single-gender schools). The final sample was derived from faculty who responded to the survey from the twelve participating schools.

Table 1

ISACS Participating Schools

School	Location	Enrollment	Type	# Teachers
A	Mid-size City	500	Pre-K-12th	70
B	Mid-size City	370	Pre-K-12th	50
C	Suburb	336	Pre-K-6th	49
D	Suburb	371	Preschool-6th	51
E	Suburb	554	K-12th	85
F	Large City	1,233	K-12th	275
G	Large City	298	Preschool-6th	41
H	Large City	359	Preschool-8th	61
I	Large City	1,162	Preschool-12th	198
J	Mid-size City	161	Preschool-12th	19
K	Small City	340	Preschool-12th	47
L	Rural Town	948	7th -12th	149
Total		6,632		1,095

Note. Suburb = Suburb of Large City. Preschool denotes a program beginning with 3-year-old students, as Pre-K denotes a program beginning with 4-year-old students.

School E is a day and a boarding school.

All respondents met the following criteria:

1. Teachers who responded were employed at a participating ISACS' accredited school in Kansas or Missouri.
2. Teachers who responded to the survey link were assumed to own a smartphone and regularly use the Internet.

Measurement

According to Carlson (1977), a self-report inventory structure requires participants to respond according to the degree to which each item reflects behavior. The tool utilized for the study was a questionnaire that asked for responses based on a Likert-type scale. A Likert-type scale is commonly used to measure opinions, beliefs, and attitudes (DeVellis, 2003). The NMP-Q is a pre-developed instrument created and validated by Yildrim (2014), who granted permission to use the survey as a measurement instrument (see Appendix D for permission to use and Appendix E for original NMP-Q). The NMP-Q was reformatted through Google Forms, which was utilized to deliver the NMP-Q via a link to participants. In addition to the 20-item NMP-Q survey, three questions regarding the respondent's gender, age, and grade level taught concluded the Google Forms questionnaire (see Appendix F).

Yildirim (2014) described the NMP-Q as being comprised of 20-items; each item generating a score between 1 (strongly disagree) and 7 (strongly agree). Total calculations of numerical responses to the 20 items generate a composite score between 20 and 140. Table 2 below depicts the interpretation of threshold levels derived from the composite scores of the NMP-Q (Yildirim, 2014). These numerical responses were used for hypothesis testing in the current study. The composite score used to set the test

values for the hypothesis testing for nomophobia was 59. A total composite score higher than 59 indicates moderate to severe levels of nomophobia.

Table 2

Threshold Levels of Nomophobia

Composite Score	Interpretation
20	Absence of nomophobia
21-59	Mild level of nomophobia
60-99	Moderate level of nomophobia
100-140	Severe nomophobia

Note. Adapted from *Exploring the Dimensions of Nomophobia: Developing and Validating a Questionnaire using Mixed Methods Research*, by C. Yildirim, 2014, Graduate Theses and Dissertations, Iowa State University, pp. 59-70.

The reliability and validity of survey instruments are important. The NMP-Q's reliability and validity is strongly evidenced by a Cronbach's alpha of .945 (Yildirim & Correia, 2015). Furthermore, through exploratory factor analysis, the NMP-Q measures four underlying factors or dimensions of nomophobia (Yildirim, 2014): (a) fear of not being able to communicate (items 10-15), (b) fear of losing connectedness (items 16-20), (c) fear of not being able to access information (items 1-4), (d) fear of giving up convenience (items 5-9). The Cronbach's alpha for the four subscales is .939, .874, .827, and .814, respectively (Yildirim, 2014). These indices suggest good reliability as the alphas for the composite score, and the four factors were well above the acknowledged minimum value of .7 (Nunnally, 1978).

The Mobile Phone Involvement Questionnaire (MPIQ) was created and validated by Walsh et al. (2010). Because the MPIQ was found to produce valid Mobile Phone Involvement scores, this instrument was utilized as a comparison survey to establish

construct validity for the NMP-Q (Yildirim, 2014). A Pearson product-moment correlation coefficient was calculated to analyze the relationship between the scores of participants on the two surveys. "The nomophobia composite score . . . on the NMP-Q were positively correlated, $r(299) = .710$, $p < .01$ to the scores on the MPIQ" (Yildirim, 2014, p. 69). This strong positive correlation, well above accepted levels, established the construct validity of the NMP-Q and indicates the questionnaires measure similar constructs (Yildirim, 2014).

Data Collection Procedures

The initial step in all research is to obtain permission to conduct the research study. Prior to reaching out to other ISACS schools, the details of the proposed research study was first outlined in an email to the researcher's head of school in Kansas. The email requested permission to survey the researcher's school of employment and explained the study's scope to the head of school. Detailed in the correspondence was that all ISACS accredited independent schools in Kansas and Missouri would be contacted for permission to survey teachers. The original email and approval response was sent on August 25, 2019 (see Appendix G for permission to originate study in the researcher's school of employment).

The next step was to gain permission from other ISACS schools to identify if a valid sample size was possible. Initial contact to the heads of schools of all ISACS accredited schools in Kansas and Missouri was completed in September 2019. The correspondence explained the scope of the survey and requested a response if the school was willing to participate pending approval from Baker University Institutional Review Board (IRB) committee (see Appendix B for the permission letter to heads of schools).

As noted in Table 1, twelve heads of schools from ISACS accredited schools from Kansas and Missouri agreed to participate in the study (see Appendix C for responses from heads of schools).

Initiation of the request for approval from the Baker University IRB began on April 13th, 2020. A completed IRB was submitted by email. The Baker University IRB committee approved the research study on April 17th, 2020 (see Appendix H for IRB approval letter).

Once approval by the Baker University IRB committee was secured, emails were generated to each school head with instructions to launch the study (see Appendix I for the emails detailing how to launch the study). On April 28, 2020, emails launching the study were sent to all twelve heads of school. The emails contained instructions requesting schools' heads to forward a section contained within the email to all teaching faculty. The section designated to be forwarded to faculty contained an introduction, a short explanation of the study, the estimated time to complete the study, a note regarding informed consent, and a link to the Google Form containing the NMP-Q (see Appendix F for online survey).

After the initial April 28th, 2020 email to heads of schools initiating the study, another email was sent on April 29th urging participation. Finally, on May 5th, 2020, a final email was sent gently requesting another push to complete the survey (see Appendix J). The survey was closed on May 12th, 2020.

Data Analysis and Hypothesis Testing

The Microsoft Excel spreadsheet generated by Google Forms was exported to IBM SPSS Statistics Version 25. This data analysis software provided an automated

analysis of the statistical measures. Four research questions, the hypothesis questions, and the data analysis used to address each are presented below.

RQ1. To what extent are teachers experiencing nomophobia?

H1. There is a significant level of nomophobia experienced by teachers.

A one-sample *t* test was conducted to test H1. The sample mean was compared to an NMP-Q composite score of 59. A one-sample *t* test was chosen for the hypothesis testing because the goal was to compare one group mean with a known value. This group mean was calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size is reported.

RQ2. To what extent is the experience of nomophobia different among teachers based on gender (female, male)?

H2. There is a significant difference in teachers' nomophobia experience based on gender (female, male).

An independent-samples *t* test was conducted to test H2. The categorical variable used to group the dependent variable, NMP-Q composite score, was gender (female, male). The independent-samples *t* test was chosen for the hypothesis testing because the hypothesis test involves examining the mean difference between two mutually exclusive independent groups (female, male). The means were calculated using data for numerical variables. The level of significance was set at .05. When appropriate, an effect size is reported.

RQ3. To what extent is the experience of nomophobia different among teachers based on age group (18-25, 26-35, 36-49, 50+)?

H3. There is a significant difference in teachers' nomophobia experience based on age group (18-25, 26-35, 36-49, 50+).

A one-factor analysis of variance (ANOVA) was conducted to test H3. The categorical variable used to group the dependent variable, NMP-Q composite score, was age group (18-25, 26-34, 35-49, 50+). The results of the one-factor ANOVA can be used to test for differences in the means for a numerical variable among three or more groups. The level of significance was set at .05. When appropriate, an effect size is reported.

RQ4. To what extent is the experience of nomophobia different among teachers based on school-level taught (early childhood, elementary school, middle school, high school)?

H4. There is a significant difference in teachers' nomophobia experience based on school level taught (early childhood, elementary school, middle school, high school).

A one-factor ANOVA was conducted to test H4. The categorical variable used to group the dependent variable, NMP-Q composite score, was school level taught (early childhood, elementary school, middle school, and high school). The results of the one-factor ANOVA can be used to test for differences in the means for a numerical variable among three or more groups. The level of significance was set at .05. When appropriate, an effect size is reported.

Limitations

There are inherent limitations to this study that may limit the interpretation and generalization of the findings. First and foremost, this is a study based on a self-report instrument. Although the instrument is reliable and valid, participants' accuracy of reporting cannot be controlled. Furthermore, although the study was conducted in

different school locations in two Midwestern states, the diversity of teachers cannot be controlled. Also, inherently there are more females in the field of education. Thus, the participation rate may be skewed toward females. Finally, even though each school's heads gave permission, there is no guarantee of consistent follow-through from every head of school regarding the timing of emails sent to faculty at the beginning of the research and follow up requests.

Summary

The purpose of this study was to analyze to what extent teachers experience nomophobia. This study identified certain demographics which may be a factor in teachers' experience of nomophobia: gender, age group, and school-level taught. These identifying factors were hypothesized to have a significant impact on a teacher's level of nomophobia. Nonrandom purposive sampling of teachers from twelve private schools in Kansas and Missouri was used to select participants. Additionally, this chapter included a description of the assessment instrument used and a discussion of validity, reliability, and measurement of the indicated variables. The data collection procedures and the analyses used to address each of the research questions were also described in this chapter. Chapter 4 provides the detailed results of the data analysis.

Chapter 4

Results

The purpose of this research study was fourfold. The first purpose was to identify the extent of nomophobia experienced by private school teachers. The second purpose was to identify if gender (female, male) is indicative of higher nomophobia levels in teachers. The third purpose was to identify if the teachers' age group (18-25, 26-34, 35-50, 51+) is a significant risk factor for higher levels of nomophobia. The final purpose was to analyze if there are differences in early childhood, elementary school, middle school, or high school teachers' nomophobia experiences.

This chapter presents the results of the investigation. Descriptive statistics are used to describe the sample. Also, necessary modifications to demographic categories are discussed as changes were needed to address sample size issues in the variables of age group and school level taught. Hypothesis tests were conducted, and the results are reported in the Hypothesis Testing section. A one-sample *t* test was utilized to identify the difference between a sample mean and a test value. An independent-samples *t* test was utilized to identify a difference between the two groups defined by the gender of the teacher (female, male). Two ANOVAs were conducted to address differences based on age group (18-25, 26-35, 36-50, 51+) and school-level taught (early childhood, elementary, middle, or high).

The additional analyses section of this chapter offers insight regarding the four underlying dimensions or factors of nomophobia: fear of being unable to communicate (Factor I), fear of losing connectedness (Factor II), fear of being unable to access information (Factor III), and fear of losing convenience (Factor IV). One-sample *t* tests,

independent-samples *t* tests, and one-factor ANOVAs were used to test hypotheses regarding teachers' responses within each separate factor of nomophobia, as well as the teachers' gender (female, male), age group (18-25, 26-35, 36-50, 51+), and school-level taught (early childhood, elementary, middle, high).

Descriptive Statistics

This research study's population was teachers from private schools accredited by ISACS throughout Kansas and Missouri. The number of teachers employed by the 12 schools surveyed numbered 1,095. Unfortunately, due to the timing of research coinciding with the COVID-19 pandemic, some administrators failed to respond once the survey was initiated. Thus, teachers whose administrators distributed the survey were asked to complete the NMP-Q. The final number of participants (n = 166) was 15% of the teachers whose school administrators originally agreed to participate in the study.

Respondents consisted of early childhood through 12th grade private school teachers who own a smartphone and have regular Internet access. In summary of overall demographics, out of the 166 participants, 70.5% of respondents categorized themselves as female. Also, teachers were asked to identify with one of four age groups. Only 1.8% of teachers classified themselves in the 18-25 age range. Due to the small number of responses from the 18-25 age group of teachers, the original four age group categories were collapsed into three age group categories: 18-35 age group, 36-50 age group, and 51+ age group. Finally, teachers were asked to categorize themselves by grade level taught. Only 8.4% categorized themselves in the early childhood category. Due to the overall sample size, the four school level categories were collapsed into three categories: early childhood and elementary school, middle school, and high school. Participant

demographics before and after the recoding of age groups and school level taught are presented in Table 3.

Table 3

Participant Demographics Used for Analysis

Characteristic		*n*	%
Original			
Gender	Female	110	70.5
	Male	46	29.5
Age Group	18-25	3	1.8
	26-35	34	21.4
	36-50	68	42.8
	50+	54	34.0
School Level Taught	Early childhood	13	8.4
	Elementary	56	36.1
	Middle	34	22.0
	High	52	33.5
Recoded			
Gender	Female	110	70.5
	Male	46	29.5
Age Group	18-35	37	23.2
	36-50	68	42.8
	50+	54	34.0
School-Level Taught	Early child/elementary	69	44.5
	Middle	34	22.0
	High	52	33.5

Note. Early child/Elementary = Early childhood and elementary school. Total number of participants analyzed from each characteristic varied due to how many answered both survey questions.

The total number of participants in the sample numbered 166. Of that sample, the number used in final calculations of each characteristic are as follows: gender (n = 156), age group (n = 159), school level taught (n = 155). The following section contains the hypothesis testing results regarding private school teachers' nomophobia experience and how that relates to teachers' gender, age group, and school-level taught.

Hypothesis Testing

Hypothesis testing addressed four research questions. The results of the four hypothesis tests are presented below. Descriptive statistics were used to examine the research questions. Results are reported in sequence after a re-statement of the research question and corresponding hypothesis, followed by a description of the analysis.

RQ1. To what extent are teachers experiencing nomophobia?

H1. There is a significant level of nomophobia experienced by teachers.

A one-sample *t* test was conducted to address RQ1. The sample mean was compared to an NMP-Q test value of 59. The value 59 was chosen to differentiate the distinction between mild and moderate nomophobia. The one-sample *t* test was chosen for the hypothesis testing to compare one group mean with a known value. The group mean was calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(159) = 3.901$, $p = .000$, Cohen's $d = 0.308$. The sample mean ($M = 66.87$, $SD = 25.52$) was significantly higher than the test value (59). H1 was supported. The Cohen's *d* indicated a small effect. Teachers experience moderate to severe nomophobia.

RQ2. To what extent is the experience of nomophobia different among teachers based on gender (female or male)?

H2. There is a significant difference in teachers' nomophobia experience based on gender.

An independent-samples *t* test was conducted to address RQ2. The two sample means of gender (female, male) were compared. An independent-samples *t* test was chosen for the hypothesis testing because the hypothesis test involves examining the mean difference between two mutually exclusive independent groups (female and male). The means are calculated using data for numerical variables. The level of significance was set at .05. When appropriate, an effect size is reported.

The results of the independent-samples *t* test indicated a statistically significant difference between the two means, $t(155) = 2.393$, $p = .018$, $d = 0.420$. The sample mean for female teachers, ($M = 69.39$, $SD = 23.44$, $n = 111$) was higher than the sample mean for male teachers, ($M = 58.93$, $SD = 28.18$, $n = 46$). H2 was supported. The effect size indicated a small effect. Teachers' experience of nomophobia is different based on gender, with females experiencing higher levels of nomophobia.

RQ3. To what extent is the experience of nomophobia different among teachers based on age group (18-35, 36-50, 50+)?

H3. There is a significant difference in teachers' nomophobia experience based on the age group.

A one-factor ANOVA was conducted to address RQ3. The categorical variable used to group the dependent variable, NMP-Q score, was the age group (18-35, 36-50, 51+). The one-factor ANOVA results can be used to test for differences in the means for

a numerical variable among three or more groups. The level of significance was set at .05. When appropriate, an effect size is reported.

The results of the analysis indicated there was a marginally significant difference between at least two of the means (18-35 age group and 36-50 age group; 18-35 age group and 51+ age group), $F(2, 156) = 3.053$, $p = .050$. See Table 4 for the means and standard deviations for this analysis. A follow-up post hoc was not warranted. H3 was marginally supported. Teachers' experience of nomophobia is different based on age group, with teachers in the 18-35 age group experiencing marginally higher levels of nomophobia than the teachers in the 36-50 age group and teachers in the 51+ age group.

Table 4

Descriptive Statistics for the Results of the Test for H3

Age Group	*M*	*SD*	*N*
18-35	75.81	21.25	37
36-50	63.72	25.80	68
51+	64.65	27.04	54

RQ4. To what extent is the experience of nomophobia different among teachers based on school level taught (early childhood and elementary, middle, high)?

H4. There is a significant difference in teachers' nomophobia experience based on the school level taught.

A one-factor ANOVA was conducted to address RQ4. The categorical variable used to group the dependent variable, NMP-Q test score, was school level taught (early childhood and elementary, middle, and high). The one-factor ANOVA results can be used to test for differences in the means for a numerical variable among three or more

groups. The level of significance was set at .05. When appropriate, an effect size is reported.

The analysis results indicated a statistically significant difference between at least two of the means, $F(2, 152) = 8.603$, $p = .000$, $\eta^2 = .102$. See Table 4 for the means and standard deviations for this analysis. A follow-up post hoc was conducted to determine which pairs of means were different. The Tukey's HSD post hoc was conducted at $\alpha = .05$. Two of the differences were significant. The early childhood/elementary teachers' mean ($M = 75.23$) was higher than the middle school teachers' mean ($M = 61.38$). Early childhood and elementary teachers' mean ($M = 75.23$) was higher than those of high school teachers ($M = 57.58$). H4 was supported. The effect size indicated a small effect. Teachers' nomophobia experience differed according to school level taught; early childhood and elementary teachers' nomophobia levels were significantly higher than middle school teachers' and high school teachers' nomophobia levels.

Table 5

Descriptive Statistics for the Results of the Test for H4

School-level taught	*M*	*SD*	*N*
Early child/elementary	75.23	24.73	69
Middle	61.38	24.81	34
High	57.58	23.83	52

Note. Early child/elementary = Early childhood and elementary.

Additional Analyses

As was described previously, the NMP-Q (Yildirim, 2014) is composed of four dimensions or factors underlying nomophobia. Other researchers have isolated and analyzed these factors, as noted in the review of the NMP-Q literature. Each factor is

measured by a group of questions from the NMP-Q: the fear of being unable to communicate is measured by items 10-15 (Factor I), the fear of losing connectedness is measured by items 16-20 (Factor II), the fear of being unable to access information is measured by items 1-4 (Factor III), and the fear of giving up convenience is measured by items 5-9 (Factor IV). In reviewing the data generated by responses from 166 teachers, potential differences in teachers' levels of nomophobia regarding each factor became an area of interest. Further analysis was required to analyze each factor of nomophobia based on gender, age group, and school-level taught. Additional analyses were completed for each factor. A test value was established for each factor consistent with the composite score threshold of 42%; the threshold where mild nomophobia becomes moderate nomophobia is a test value of 59 or 42% on the 20 item NMP-Q. This value was used as the threshold for each factor in order to remain consistent with the testing of RQ1: Factor 1 (42% = 18), Factor II (42% = 15), Factor III (42% = 12), Factor IV (42% = 15). Table 6 below presents the threshold ranges showing established factor scores consistent with each factor's composite score. The four dimensions or factors underlying nomophobia were tested among teacher subgroups of gender, age group, and school-level taught. Results follow and are reported in order by factor.

Table 6

Thresholds Ranges for Nomophobia Composite Score and Factor Scores

Scale	Composite	Factor I	Factor II	Factor III	Factor IV
Number of items	20	6	5	4	5
Interpretation					
Absence	1-20	1-6	1-5	1-4	1-5
Mild	21-59	7-18	6-15	5-12	6-15
Moderate	60-99	19-29	16-24	13-19	16-24
Severe	100-140	30-42	25-35	20-28	25-35

Factor I: The fear of being unable to communicate. A one-sample *t* test was conducted to test the teachers' experiences with the first of four underlying dimensions or factors of nomophobia: the fear of being unable to communicate. The mean of the NMP-Q scores used for Factor I was compared to a test value of 18. The one-sample *t* test was chosen for the hypothesis testing to compare one group mean with a known value. The group mean was calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(164) = 6.950$, $p = .000$, Cohen's $d = 0.54$. The sample mean ($M = 23.38$, $SD = 9.95$) was significantly higher than the test value (18). Factor I, the fear of being unable to communicate, was a supported factor underlying nomophobia in surveyed teachers. The effect size indicated a medium effect. Teachers experienced moderate to severe levels of nomophobia, specifically regarding the dimension of the fear of being unable to communicate.

Gender. An independent-samples *t* test was conducted to test gender-related differences in teachers' scores for the first of four underlying dimensions or factors of nomophobia: the fear of being unable to communicate. The two-sample means were compared. An independent-samples *t* test was chosen for testing to examine the mean difference between two mutually exclusive independent groups (female and male). The means are calculated using data for numerical variables. The level of significance was set at .05. When appropriate, an effect size, as indexed by Cohen's *d*, is reported.

The results of the independent-samples *t* test indicated a statistically significant difference between the two means, $t(160) = 3.472$, $p = .001$, $d = 0.60$. The sample mean for female teachers ($M = 24.96$, $SD = 9.57$, $n = 116$) was higher than the sample mean for male teachers ($M = 19.11$, $SD = 9.57$, $n = 46$). A gender difference was supported for Factor I. The effect size indicated a medium effect. Female teachers' scores on the first factor regarding the fear of being unable to communicate indicated a higher level of nomophobia than male teachers.

Age group. A one-factor ANOVA was conducted to test for age group related differences and teachers' experiences with the first of four underlying dimensions or factors of nomophobia: the fear of being unable to communicate. The categorical variable used to group the dependent variable, Factor I, was the age group (18-35, 36-50, 51+). The one-factor ANOVA results can be used to test for differences in the means for a numerical variable among three or more groups. The level of significance was set at .05. When appropriate, an effect size, as indexed by *eta-squared*, is reported.

The analysis results indicated there was not a significant difference between at least two of the means, $F = 1.585$, $df = (2, 161)$, $p = .208$. See Table 7 for the means and

standard deviations for this analysis. No differences were found based on age group in teachers' level of nomophobia associated with the fear of being unable to communicate.

Table 7

Descriptive Statistics for Factor I by Age Group

Age Group	*M*	*SD*	*N*
18-35	25.79	8.67	39
36-50	22.30	10.22	69
51+	23.05	10.40	56

School-level taught. A one-factor ANOVA was conducted to test for school level related difference and teachers' experiences of the first of four underlying dimensions or factors of nomophobia: the fear of being unable to communicate. The categorical variable used to group the dependent variable, Factor I, was grade level taught (early childhood and elementary school, middle school, and high school). The one-factor ANOVA results can be used to test for differences in the means for a numerical variable among three or more groups. The level of significance was set at .05. When appropriate, an effect size, as indexed by *eta-squared*, is reported.

The analysis results indicated a statistically significant difference between at least two of the means, $F(2, 157) = 8.710$, $p = .000$, $\eta^2 = .100$. See Table 8 for the means and standard deviations for this analysis. A follow-up post hoc was conducted to determine which pairs of means were different. The Tukey's HSD post hoc was conducted at $\alpha = .05$. One of the differences was significant. The early childhood and elementary school teachers' mean ($M = 26.30$) was higher than the high school teachers' mean ($M = 19.11$). A difference based on grade level taught was supported for Factor I. The effect size indicated a small effect. The level of nomophobia associated with the fear of

being unable to communicate for early childhood and elementary teachers was higher than the fear of being unable to communicate for high school teachers.

Table 8

Descriptive Statistics for Factor I by School Level Taught

School-level taught	*M*	*SD*	*N*
Early child/elementary	26.30	9.79	71
Middle	22.67	9.74	36
High	19.11	8.94	53

Note. Early child/elementary = Early childhood and elementary.

Factor II: The fear of losing connectedness. A one-sample *t* test was conducted to test teachers' experiences regarding the second of four underlying dimensions or factors of nomophobia: the fear of losing connectedness. The mean of the NMP-Q scores used for Factor II was compared to a test value of 15. The one-sample *t* test was chosen for the hypothesis testing to compare one group mean with a known value. The group mean was calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size is reported.

The results of the one-sample *t* test indicated no difference between the group mean and the test value, $t(161) = -6.760$, $p = .000$, Cohen's $d = 0.53$. The sample mean ($M = 11.53$, $SD = 6.53$) was significantly lower than the test value (15). Factor II, the fear of losing connectedness was not a supported factor in surveyed teachers. Teachers did not experience a moderate to severe level of fear of losing connectedness.

Gender. An independent-samples *t* test was conducted to test gender-related differences and teachers' experiences with the second of four underlying dimensions or factors of nomophobia: the fear of losing connectedness. The two sample means were

compared. An independent-samples *t* test was chosen for the hypothesis testing to examine the mean difference between two mutually exclusive independent groups (female and male). The means are calculated using data for numerical variables. The level of significance was set at .05. When appropriate, an effect size, as indexed by Cohen's *d*, is reported.

The results of the independent-samples *t* test indicated no difference between the two means, $t(157) = -0.493$, $p = .623$. The sample mean for female teachers ($M = 11.17$, $SD = 5.96$, $n = 113$) was no different from the sample mean for male teachers ($M = 11.72$, $SD = 7.29$, $n = 46$). A gender difference was not supported for Factor II. The fear of losing connectedness was not significantly different for female and male teachers.

Age group. A one-factor ANOVA was conducted to test for age group related differences and teachers' experiences with the second of four underlying dimensions or factors of nomophobia: the fear of losing connectedness. The categorical variable used to group the dependent variable, Factor II, was the age group (18-35, 36-50, 51+). The one-factor ANOVA results can be used to test for differences in the means for a numerical variable among three or more groups. The level of significance was set at .05. When appropriate, an effect size, as indexed by *eta-squared*, is reported.

The analysis results indicated a marginally significant difference between at least two of the means, $F = 2.773$, $df = (2, 158)$, $p = .066$ $\eta^2 = .034$. See Table 9 for the means and standard deviations for this analysis. Although the difference was not statistically significant, the age group 18-35 teachers' mean ($M = 13.46$) was higher than the age group 36-50 teachers' mean ($M = 10.37$). The age group 18-35 teachers' mean ($M = 13.46$) was also higher than the age group 51+ teachers' mean ($M = 11.67$). A

marginal difference based on age group was supported for Factor II. Regarding teachers' level of nomophobia associated with the fear of losing connectedness, the 18-35 age group was marginally higher than the 36-50 age group and the 51+ age group.

Table 9

Descriptive Statistics for Factor II by Age Group

Age Group	*M*	*SD*	*N*
18-35	13.46	5.93	37
36-50	10.37	6.33	70
51+	11.67	7.00	54

School-level taught. A one-factor ANOVA was conducted to test for school level related differences and teachers' experiences of the second of four underlying dimensions or factors of nomophobia: the fear of losing connectedness. The categorical variable used to group the dependent variable, Factor II, was grade level taught (early childhood and elementary school, middle school, and high school). The one-factor ANOVA results can be used to test for differences in the means for a numerical variable among three or more groups. The level of significance was set at .05. When appropriate, an effect size, as indexed by *eta-squared*, is reported.

The analysis results indicated a marginally significant difference between at least two of the means, $F(2, 154) = 3.052$, $p = .050$. See Table 10 for the means and standard deviations for this analysis. Although the finding was not statistically significant, the early childhood and elementary school teachers' mean ($M = 12.90$) was higher than the high school teachers' mean ($M = 10.21$), and the early childhood and elementary school teachers' mean ($M = 12.90$) was higher than the middle school teachers' mean ($M = 10.49$). A difference based on school-level taught was supported for Factor II. The

level of nomophobia associated with the fear of losing connectedness for early childhood and elementary teachers was higher than the fear of losing connectedness for middle and high school teachers.

Table 10

Descriptive Statistics for Factor II by School Level Taught

School-level taught	*M*	*SD*	*N*
Early child/elementary	12.90	7.25	69
Middle	10.49	6.13	35
High	10.21	5.70	53

Note. Early child/elementary = Early childhood and elementary.

Factor III: The fear of being unable to access information. A one-sample *t* test was conducted to test teachers' experiences of the third of four underlying dimensions or factors of nomophobia: the fear of being unable to access information. The mean of the NMP-Q scores used for Factor III was compared to a test value of 12. The one-sample *t* test was chosen for the hypothesis testing to compare one group mean with a known value. The group mean was calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(165) = 9.010$, $p = .000$, Cohen's $d = 0.70$. The sample mean ($M = 16.23$, $SD = 6.05$) was significantly higher than the test value (12). Factor III, the fear of being unable to access information, was a supported factor underlying nomophobia in surveyed teachers. The effect size indicated a medium effect. Teachers experienced moderate to severe levels of nomophobia, specifically regarding the dimension of being unable to access information.

Gender. An independent-samples *t* test was conducted to test gender-related differences and teachers' experiences with the third of four underlying dimensions or factors of nomophobia: the fear of being unable to access information. The two sample means were compared. An independent-samples *t* test was chosen for the hypothesis testing to examine the mean difference between two mutually exclusive independent groups (female and male). The means are calculated using data for numerical variables. The level of significance was set at .05. When appropriate, an effect size, as indexed by Cohen's *d*, is reported.

The results of the independent-samples *t* test indicated a significant difference between the two means, $t(161) = 2.591$, $p = .010$, $d = 0.45$. The sample mean for female teachers ($M = 16.89$, $SD = 5.62$, $n = 117$) was significantly higher than the sample mean for male teachers ($M = 14.22$, $SD = 6.65$, $n = 46$). A gender difference was supported for Factor III. The effect size indicated a medium effect. Female teachers showed a significantly higher fear of being unable to access information than male teachers.

Age group. A one-factor ANOVA was conducted to test for age group related differences and teachers' experiences with the third of four underlying dimensions or factors of nomophobia: the fear of being unable to access information. The categorical variable used to group the dependent variable, Factor III, was the age group (18-35, 36-50, 51+). The one-factor ANOVA results can be used to test for differences in the means for a numerical variable among three or more groups. The level of significance was set at .05. When appropriate, an effect size, as indexed by *eta-squared*, is reported.

The analysis results indicated a statistically significant difference between at least two of the means, $F = 7.077$, $df = (2, 162)$, $p = .001$ $\eta^2 = .080$. See Table 11 for the means

and standard deviations for this analysis. A follow-up post hoc was conducted to determine which pairs of means were different. The Tukey's HSD post hoc was conducted at $\alpha = .05$. Two of the differences were marginally significant. The age group 18-35 teachers' mean ($M = 18.95$) was higher than the age group 51+ teachers' mean ($M = 14.36$). Although the difference was not statistically significant, the age group 18-35 teachers' mean ($M = 18.95$) was higher than the age group 36-50 teachers' mean ($M = 16.23$). Differences based on age group was supported in Factor III. The effect size indicated a small effect. Teachers' level of nomophobia associated with the fear of being unable to access information was significantly higher in the 18-35 age group than the 51+ age group.

Table 11

Descriptive Statistics for Factor III by Age Group

Age Group	*M*	*SD*	*N*
18-35	18.95	5.02	39
36-50	16.23	6.19	70
51+	14.36	5.95	56

School-level taught. A one-factor ANOVA was conducted to test for school-level differences and teachers' experiences with the third of four underlying dimensions or factors of nomophobia: the fear of being unable to access information. The categorical variable used to group the dependent variable, Factor III, was grade level taught (early childhood and elementary school, middle school, and high school). The one-factor ANOVA results can be used to test for differences in the means for a numerical variable among three or more groups. The level of significance was set at .05. When appropriate, an effect size, as indexed by *eta-squared*, is reported.

The analysis results indicated a statistically significant difference between at least two of the means, $F(2, 158) = 6.844$, $p = .001$, $\eta^2 = .080$. See Table 12 for the means and standard deviations for this analysis. A follow-up post hoc was conducted to determine which pairs of means were different. The Tukey's HSD post hoc was conducted at $\alpha = .05$. Two of the differences were significant or marginally significant. The early childhood and elementary school teachers' mean ($M = 18.01$) was higher than those of high school teachers ($M = 14.19$). Although not statistically significant, the early childhood and elementary school teachers' mean ($M = 18.01$) was higher than the middle school teachers' mean ($M = 15.35$). A difference based on school-level taught was supported in Factor III. The effect size indicated a small effect. The level of nomophobia associated with the fear of being unable to access information for early childhood and elementary teachers was higher than the fear of being unable to access information for middle and high school teachers.

Table 12

Descriptive Statistics for Factor III by School Level Taught

School-level taught	*M*	*SD*	*N*
Early child/elementary	18.01	5.48	71
Middle	15.35	5.91	37
High	14.19	6.38	53

Note. Early child/elementary = Early childhood and elementary.

Factor IV: The fear of losing convenience. A one-sample *t* test was conducted to test teachers' experiences of the fourth of four underlying dimensions or factors of nomophobia: the fear of losing convenience. The mean of the NMP-Q scores used for Factor IV was compared to a test value of 15. The one-sample *t* test was chosen for the

hypothesis testing to compare one group mean with a known value. The group mean was calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size is reported.

The results of the one-sample *t* test indicated no difference between the group mean and the test value, $t(164) = 1.786$, $p = .076$. The sample mean ($M = 15.98$, $SD = 7.06$) was not different from the test value (15). Factor IV, the fear of losing convenience, was not a supported factor underlying nomophobia in surveyed teachers. Teachers did not experience moderate to severe levels of nomophobia, specifically regarding the dimension of losing convenience.

Gender. An independent-samples *t* test was conducted to test for gender-related differences and teachers' experiences with the fourth of four underlying dimensions or factors of nomophobia: the fear of losing convenience. The two-sample means were compared. An independent-samples *t* test was chosen for the hypothesis testing to examine the mean difference between two mutually exclusive independent groups (female and male). The means are calculated using data for numerical. The level of significance was set at .05. When appropriate, an effect size, as indexed by Cohen's *d*, is reported.

The results of the independent-samples *t* test indicated a statistically significant difference between the two means, $t(160) = 2.256$, $p = .025$, $d = 0.39$. The sample mean for female teachers ($M = 16.61$, $SD = 6.85$, $n = 116$) was higher than the sample mean for male teachers ($M = 13.89$, $SD = 7.10$, $n = 46$). A gender difference was supported for Factor IV. The effect size indicated a medium effect. Female teachers' experiences regarding the fear of losing convenience indicated a higher level than male teachers.

Age group. A one-factor ANOVA was conducted to test for age-related differences and teachers' experiences with the fourth of four underlying dimensions or factors of nomophobia: the fear of losing convenience. The categorical variable used to group the dependent variable, Factor IV, was the age group (18-35, 36-50, 51+). The one-factor ANOVA results can be used to test for differences in the means for a numerical variable among three or more groups. The level of significance was set at .05. When appropriate, an effect size, as indexed by *eta-squared,* is reported.

The results of the analysis indicated there was a statistically significant difference between at least two of the means, $F = 3.881$, $df = (2, 161)$, $p = .023$, $\eta^2 = .046$. See Table 13 for the means and standard deviations for this analysis. A follow-up post hoc was conducted to determine which pairs of means were different. The Tukey's HSD post hoc was conducted at $\alpha = .05$. One of the differences was significant. The age group 18-35 teachers' mean ($M = 18.38$) was higher than the age group 36-50 teachers' mean ($M = 14.51$). A difference in age range was supported in Factor IV. The effect size indicated a small effect. Teachers in the 18-35 age group experience a higher level of nomophobia associated with the fear of losing convenience than the older age groups.

Table 13

Descriptive Statistics for Factor IV by Age Group

Age Group	*M*	*SD*	*N*
18-35	18.38	6.69	39
36-50	14.51	6.81	69
51+	16.07	7.31	56

School-level taught. A one-factor ANOVA was conducted to test for school level related differences and teachers' levels of the fourth of four underlying dimensions or

factors of nomophobia: the loss of convenience. The categorical variable used to group the dependent variable, Factor IV, was grade level taught (early childhood and elementary school, middle school, and high school). The one-factor ANOVA results can be used to test for differences in the means for a numerical variable among three or more groups. The level of significance was set at .05. When appropriate, an effect size, as indexed by *eta-squared*, is reported.

The analysis results indicated a statistically significant difference between at least two of the means, $F(2, 157) = 10.623$, $p = .000$, $\eta^2 = .119$. See Table 14 for the means and standard deviations for this analysis. A follow-up post hoc was conducted to determine which pairs of means were different. The Tukey's HSD post hoc was conducted at $\alpha = .05$. Two of the differences were significant. The early childhood and elementary school teachers' mean ($M = 18.58$) was higher than those of high school teachers ($M = 13.67$). The early childhood and elementary school teachers' mean ($M = 18.58$) was higher than those of middle school teachers ($M = 13.70$). A difference based on school-level taught was supported for Factor IV. The effect size indicated a small effect. The level of nomophobia associated with the fear of losing convenience for early childhood and elementary teachers was higher than the fear of losing convenience for middle and high school teachers.

Table 14

Descriptive Statistics for Factor IV by School Level Taught

School-level taught	*M*	*SD*	*N*
Early child/elementary	18.58	6.85	71
Middle	13.70	6.75	37
High	13.67	6.36	52

Note. Early child/elementary = Early childhood and elementary.

Summary

In this chapter, an introduction provided an overview of the analysis and statistical tests conducted, as well as the order addressed. The demographic analysis described the sample of teachers who completed the 20-item NMP-Q and three demographic questions describing gender, age group, and school-level taught. The results of the one-sample and independent-samples *t* tests and ANOVAs that were used to test hypotheses one through four were explained. Additional analyses were used to describe the respondents' nomophobia levels on the four underlying dimensions or factors identified by the NMP-Q concerning gender, age group, and grade level taught. The results of the one-sample and independent-samples *t* tests and ANOVAs that were used to test these areas of additional analyses were explained. Chapter 5 includes the interpretation and recommendations regarding these findings. Included is a summary of the research study, major findings, connections to the research, implications for action, recommendations for future research, and concluding remarks.

Chapter 5

Interpretation and Recommendations

This study's purpose was to determine the extent of professional private school teachers' experiences of nomophobia and to identify any differences in nomophobia levels based on gender, age group, or school-level taught. The previous chapter reported the results of the hypothesis testing. Chapter 5 summarizes Chapters 1 through 4 of the study, including an overview of the problem, purpose statement, research questions, a review of methodology, and major findings. This is followed by the discussion of the findings in literature. Finally, the conclusion section includes implications for action and recommendations for further research. Concluding remarks are presented.

Study Summary

Mobile technology in classrooms is now commonplace. Yildirim and Correia (2015) defined nomophobia as "the fear of being unable to use one's mobile phone or being unreachable through one's mobile phone" (p. 1323). Dixit et al. (2010) went one step further described nomophobia as the "emerging problem of the modern era" (p. 341). The question of whether teachers struggle with nomophobia has not been researched previously. Therefore, implications of experiences surrounding nomophobia from the teacher perspective are largely unknown. This research was designed to move beyond the typical student-focused study regarding smartphone users' personal lack of attention, multi-tasking problems, and disruption of neighboring students. The classroom hub is the teacher. Understanding teachers' level of nomophobia and demographic information about nomophobia is a critical first step in understanding how nomophobia may impact the classroom. This section provides an overview of the problem, the purpose statement

and research questions, a review of the methodology, and the study's major findings. The final sections of this chapter offer conclusions, implications for action and for further study, and final remarks.

Overview of the problem. Mobile technologies, specifically smartphones, with the ability to connect to the Internet anywhere and anytime, provide users with on-demand, highly efficient, and effective communication, as well as seemingly unlimited access to information (Kim et al., 2016). Walsh and White (2007) described three types of problematic phone use, which are indicators of smartphone addiction: dangerous usage, inappropriate usage, and overuse. Nomophobia is described as a separation anxiety from one's smartphone and is caused by smartphone overuse, a relatively new phenomenon, with few studies on the subject (Bragazzi & Del Puente, 2014). Durak (2019) identified a relationship between smartphone addiction and nomophobia. Nomophobia has four underlying dimensions identified by Yildirim and Correia (2015): the fear of being unable to communicate (Factor I), the fear of losing connectedness (Factor II), the fear of being unable to access information (Factor III), and the fear of losing convenience (Factor IV).

Many technology devices are commonly found in today's classrooms: computers, iPads, Chromebooks, smartboards, and smartphones. These tools open a wide world for students, previously limited to static text and graphics in books. Teachers set the pace of the classroom. Knowing whether technology, specifically smartphones, may be affecting teachers emotionally or even physically is important information. The majority of prior nomophobia research is focused on students; this current research is critical in

understanding nomophobia from teachers' perspective to attain an accurate picture of the impact nomophobia has in the classroom.

Purpose statement and research questions. Four purposes guided this study. The first purpose was to find out the extent private school teachers experience nomophobia. The extent of nomophobia was measured using The Nomophobia Questionnaire (NMP-Q) created and validated by Yildirim (2014) and Yildirim and Correia (2015). Interpretation of the NMP-Q provides four threshold levels of nomophobia: absence of nomophobia, mild nomophobia, moderate nomophobia, or severe nomophobia. The second purpose was to identify a difference in teachers' levels of nomophobia based on gender. The third purpose was to identify a difference in nomophobia levels based on teachers' age group (18-35, 36-50, 51+). The final purpose was to analyze differences in nomophobia among early childhood, elementary school, middle school, and high school classroom teachers. Four research questions were developed, and four hypotheses were tested to address this current study's purposes. Additional analyses led to expanding the study to analyze the four underlying factors of nomophobia as each factor related to teacher's level of nomophobia, in conjunction with teacher gender, age group, and school-level taught.

Review of the methodology. A quantitative research design guided this study. Specifically, a non-experimental study was conducted**.** Teachers in private schools across two states were administered the NMP-Q survey to determine the extent of nomophobia. The dependent variable was the self-reported levels of nomophobia derived from teachers' answers on the NMP-Q. Independent variables for this study included gender (Female, Male), age group (18-35, 36-50, 51+), and school-level taught (early

childhood and elementary, middle, high). A one-sample *t* test was utilized to identify the difference between a sample means and null value. An independent-samples *t* test was utilized to identify the difference between two groups defined by the gender of the teacher (female or male). One-factor ANOVAs were conducted to address differences based on age group (18-35, 36-50, 51+) and school-level taught (early childhood and elementary, middle, or high). In order to remain consistent, the same tests were utilized for each factor in the additional analyses section: one-sample *t* test to identify the difference between a sample mean and null value; an independent-samples *t* test to identify the difference between two groups defined by the gender of the teacher (female or male); one-factor ANOVAs to address differences based on age group (18-35,36-50,51+) and school-level taught (early childhood and elementary, middle, or high).

Major findings. The results of the study indicated that teachers indeed experience significant levels of nomophobia. In fact, the sample mean revealed that teachers experience moderate to severe levels of nomophobia. The results of the test for differences based on gender revealed that females experience significantly higher levels of nomophobia than males. The results of the test for differences based on age group revealed nomophobia levels in the 18-35 age group tend to be higher than 36-50 and 51+ age ranges, but the difference was marginally significant. The results of the test for differences based on school-level taught revealed that early childhood and elementary teachers' nomophobia levels are significantly higher than middle and high school teachers' nomophobia levels.

In order to delve deeper into the dimensions of nomophobia, further analysis was conducted regarding teacher's experiences and the four underlying factors of

nomophobia: the fear of being unable to communicate, the fear of losing connectedness, the fear of being unable to access information, and the fear of losing convenience. Results revealed teachers experience moderate to severe levels of nomophobia regarding two dimensions: the fear of being unable to communicate and the fear of being unable to access information. Teachers did not experience moderate or severe nomophobia levels regarding the fear of losing connectedness or the fear of losing convenience.

Further analysis addressing differences based on gender and the four underlying factors of nomophobia revealed that female teachers experience significantly higher levels of nomophobia than male teachers in only two out of four factors: fear of being unable to communicate and the fear of losing convenience. Analysis regarding differences based on age group revealed younger teachers (18-35 age group) experience higher levels of nomophobia as measured by three out of four factors: fear of losing connectedness, fear of being unable to access information, and the fear of losing convenience. Analysis regarding teachers working at lower grade levels (early childhood and elementary) revealed these teachers experience significantly higher levels of nomophobia than middle or high school teachers in three out of four factors: fear of being unable to communicate, fear of being unable to access information, and the fear of losing convenience. Teachers of early childhood and elementary students were found to have marginally higher nomophobia levels than middle or high school teachers regarding the fear of losing connectedness.

Findings Related to the Literature

The findings in this section are organized in the order of the four research questions and additional analyses of the four underlying factors of nomophobia. At the

current time, there are no published studies regarding nomophobia using a sample of employed teachers. The studies conducted by Gezgin et al. (2017) and Moreno-Guerrero, Lopez-Belmonte, et al. (2020) are highlighted when applicable since pre-service teachers (college students studying to be teachers) made up the samples in both of these studies of nomophobia. Research regarding overall levels of nomophobia, gender, and age group are compared to findings. School-level taught has not been researched in other studies of nomophobia at the time of this study. This section concludes with findings in the literature regarding the four underlying factors of nomophobia addressed in additional analysis.

Level of nomophobia. The reporting of nomophobia varies in the research literature. Some researchers report prevalence, percentages, or averages, and some identify severity levels (mild, moderate, severe). Therefore, establishing a common denominator across literature is difficult. The hypothesis testing results for the current study indicated that teachers experience moderate to severe levels of nomophobia. This coincides with the study results by Gezgin et al. (2017), which indicated higher levels of nomophobia in pre-service teachers than average college students. However, the study of pre-service teachers conducted by Moreno-Guerrero, Lopez-Belmonte et al. (2020) indicated only an average amount of nomophobia in the sample.

Nonetheless, numerous nomophobia studies reported concerns about high levels of nomophobia. This current study's findings align with many researchers who found significant levels of nomophobia. Although there are reporting differences in the way nomophobia levels qualified as significant, there is no doubt that many of the researchers

deem nomophobia a significant concern. The 24 studies which indicated significant levels of nomophobia are detailed in Table 15 below.

Table 15

Studies Identifying Significant Levels of Nomophobia

Authors of Study	Year	Sample	Location	Instrument(s)
Adnan & Gezgin	2016	475 college students	Turkey	NMP-Q
Aguilera-Manrique et al.	2018	304 nursing students	Spain	NMP-Q
Ahmed et al.	2019	157 nursing students	India	NMP-Q
Argumosa-Villar et al.	2017	242 high school students	Spain	MPIQ
Bartwal & Nath	2019	451 medical students	India	NMP-Q
Bragazzi et al.	2019	403 Italian students	Italy	NMP-Q
Dasgupta et al.	2017	608 university students	Iran	NMP-Q
Darvishi et al.	2019	100 medical students	Iran	Ad hoc questionnaire
Davie & Hilber	2017	104 university students	Germany	NMP-Q
Farooqui et al.	2018	145 medical students	India	NMP-Q
Gezgin et al.	2018	929 high school students	Turkey	NMP-Q, IAS
Gutierrez-Puertas et al.	2019	258 university students	Spain, Portugal	NMP-Q
Han et al.	2017	301 university students	Hong Kong	Ad hoc questionnaire
King et al.	2014	50 patients w/ panic disorder	Brazil	Ad hoc questionnaire
Lee et al.	2017	397 university students	USA	NMP-Q, OBS
Mendoza et al.	2018	160 university students	USA	NMP-Q
Musa et al.	2017	252 people of various ages	Malaysia	Ad hoc questionnaire
Ozdemir et al.	2018	729 university students	Turkey, Pakistan	NMP-Q, ULS-8
Prasad et al.	2017	554 university students	India	NMP-Q
SecureEnvoy	2012	1,000 employed adults	UK	Ad hoc questionnaire
Tams et al.	2018	270 business professionals	Canada	NMP-Q, ad hoc
Rosales-Huamani et al.	2019	461 university students	Peru	Ad hoc questionnaire
Yildirim & Correia	2015	301 university students	USA	NMP-Q
Yildirim et al.	2016	537 university students	Turkey	NMP-Q

Note. MPIQ = Mobile Phone Involvement Questionnaire. ULS-8 = UCLA Loneliness Scale. IAS = Internet Addiction Scale.

Further analysis in this current study identified significant nomophobia levels in three out of four of the underlying factors. The first factor, the fear of being unable to communicate, was at the moderate to severe level of nomophobia. Both studies using samples of pre-service teachers conducted by Gezgin et al. (2017) and Moreno-Guerrero, Lopez-Belmonte et al. (2020) reported similar significant levels of nomophobia as this current study regarding (Factor I), the fear of being unable to communicate. Due to the fact that 13 researchers found significant levels of nomophobia in subjects regarding Factor 1, the fear of being unable to communicate, Table 16 below has been provided as a convenient reference. This current study and findings in the literature agree that the fear of being unable to communicate is a significant factor underlying nomophobia. Also, Ahmed et al. (2019), Argumosa-Villar et al. (2017), and Yildirim and Correia (2015) stated the fear of being unable to communicate is the most concerning factor affecting individuals with nomophobia when a smartphone is unavailable. In addition, Moreno-Guerrero, Aznar-Diaz, et al. (2020) utilizing a sample of 1,743 students from Spain found that the highest levels of nomophobia were concentrated in (Factor I), the fear of losing communication.

Table 16

Studies Identifying Significant Levels of Nomophobia Regarding Factor I

Authors of Study	Year	Sample	Location	Instrument(s)
Ahmed et al.	2019	157 nursing students	India	NMP-Q
Ak & Yildirim	2018	146 university students	Turkey	NMP-Q
Argumosa-Villar et al.	2017	242 high school students	Spain	MPIQ
Arpaci et al.	2019	490 university students	Turkey	NMP-Q, INDCOL
Bartwal & Nath	2019	451 medical students	India	NMP-Q
Dasgupta et al.	2017	608 university students	Iran	NMP-Q
Gezgin et al.	2018	929 high school students	Turkey	NMP-Q, IAS
Mendoza et al.	2018	160 university students	USA	NMP-Q
Moreno-Guerrero, Aznar-Diaz, et al.	2020	1,743 high school students	Spain	NMP-Q
Moreno-Guerrero, Lopez-Belmonte, et al.	2020	849 pre-service teachers	Spain	NMP-Q
Rosales-Huamani et al.	2019	461 university students	Peru	Ad hoc survey
Yildirim & Correia	2015	301 university students	USA	NMP-Q
Yildirim et al.	2016	537 university students	Turkey	NMP-Q

Note. MPIQ = Mobil Phone Involvement Questionnaire. INDCOL = Individual Collectivism.

The second factor, the fear of losing connectedness, was identified as a marginal concern in the current study, but not to the moderate to severe level of nomophobia. Moreno-Guerrero, Lopez-Belmonte, et al. (2020) found similar levels of nomophobia as this current study in a sample of pre-service teachers. However, Mendoza et al. (2018) found that the fear of losing connectedness was one of the greatest concerns in a study using a sample of 160 university students from the U.S. Similarly, Gezgin et al. (2017) also found the fear of losing connectedness of significant concern, especially for younger

pre-service teachers. No table was provided due to less findings reported in literature regarding Factor II, the fear of losing connectedness.

The third factor, the fear of being unable to access information, was found in this current study to be at the moderate to severe level of nomophobia. Gezgin et al. (2017) agreed with the current study's findings reporting high levels of this fear in pre-service teachers when a smartphone is unavailable. Yildirim et al. (2016) also agreed with this current study's findings, and furthermore noted the fear of not being able to access information generated the highest level of nomophobia as compared to the other factors. This finding is inconsistent with Yildirim and Correia's (2015) study, which noted the fear of being unable to communicate as generating the highest level of concern for individuals with nomophobia. This current study agreed with both Yildirim et al. (2016) and Yildirim and Correia (2015) that both Factor I and Factor III are of significant concern. No table was provided due to less findings reported in literature regarding Factor III, the fear of being unable to access information.

The fourth factor, the fear of losing convenience (referred to as comfort in some literature), was not considered a concern in this current study. Similar to this current study, Gezgin et al. (2017) reported the fear of losing convenience as the least concerning and lowest reported level of the four underlying dimensions of nomophobia. Nonetheless, Mendoza et al. (2018) stated that the fear of losing convenience was one of the greatest concerns among a sample of university students. Ak and Yildirim (2018) noted that the fear of losing convenience was reported as a high level of concern for only females. More study is warranted as this factor contains the most contradictions in the

literature to date. No table was provided due to less findings reported in literature regarding Factor IV, the fear of losing convenience.

Gender. Analysis for the current study included tests for significant differences in nomophobia levels regarding teacher gender. The results indicated that teachers experience differing levels of nomophobia based on gender; specifically, females experience significantly higher nomophobia levels than males. This is consistent with the study conducted by Gezgin et al. (2017), which documented that pre-service teachers indicated higher levels of nomophobia than typical college students. Furthermore, significantly higher nomophobia levels in pre-service female teachers, as opposed to pre-service male teachers, was noted (Gezgin et al., 2017). This is also consistent with nine other student studies displayed in Table 17, whose authors reported females reported higher levels of nomophobia than males.

Table 17

Studies Identifying Females with Higher Levels of Nomophobia

Authors of Study	Year	Sample	Location	Instrument
Aguilera-Manrique et al.	2018	304 nursing students	Spain	NMP-Q
Ak & Yildirim	2018	146 university students	Turkey	NMP-Q
Arpaci et al.	2017	450 university students	Turkey	NMP-Q, ECR, MAAS
Arpaci et al.	2019	490 university students	Turkey	NMP-Q, INDCOL
Dasgupta et al.	2017	608 university students	Iran	NMP-Q
Gezgin et al.	2017	818 pre-service teachers	Turkey	NMP-Q
Gezgin et al.	2018	929 high school students	Turkey	NMP-Q, IAS
Moreno-Guerrero, Aznar-Diaz, et al.	2020	1,743 high school students	Spain	NMP-Q
Prasad et al.	2017	554 university students	India	NMP-Q
Yildirim et al.	2016	537 university students	Turkey	NMP-Q

Note. ECR = Scale of Experiences in Close Relationships. MAAS = Scale of Awareness of Attention Mindfuld-Advertencia. INDCOL = Individual Collectivism. IAS = Internet Addiction Scale.

Nevertheless, researchers are not in total agreement. Darvishi et al. (2019) noted significantly lower levels of nomophobia in a sample of 100 female medical students as opposed to the levels of nomophobia of males. Ozdemir et al. (2018) and Davie and Hilber (2017) found that males were somewhat more likely to be nomophobic than females. Seven other nomophobia studies are noted in Table 18 below, whose authors found no gender differences. Further study is warranted to understand these inconsistencies in the area of gender and nomophobia.

Table 18

Studies Identifying No Gender Differences

Authors of Study	Year	Sample	Location	Instrument(s)
Ahmed et al.	2019	157 nursing students	India	NMP-Q
Al-Balhan et al.	2018	512 adults	Kuwait	NMP-Q
Argumosa-Villar et al.	2017	242 high school students	Spain	MPIQ
Arpaci et al.	2017	450 university students	Turkey	NMP-Q, ECR, MAAS
Dixit et al.	2010	200 medical students	India	Ad hoc questionnaire
Farooqui et al.	2018	145 medical students	India	NMP-Q
Lin et al.	2018	3,216 adolescents	Iran	NMP-Q

Note. MPIQ = Mobile Phone Involvement Questionnaire. ECR = Scale of Experiences in Close Relationships. MAAS = Scale of Awareness of Attention Mindfuld-Advertencia.

In this current study, additional analysis identified a gender difference in three out of four underlying factors of nomophobia. Female teachers were identified as more nomophobic than male teachers in Factor I, the fear of being unable to communicate, Factor III, the fear of being unable to access information, and Factor IV the fear of losing

convenience. Three other studies shown in Table 19 below reported higher nomophobia levels in females for two of the same underlying factors: Factor I, the fear of being unable to communicate, and Factor IV, the fear of losing convenience (or comfort). "There is a direct relationship between not being able to communicate or giving up comfort, with nomophobia affecting women more directly than men" (Moreno-Guerrero, Lopez-Belmonte, et al., 2020, Discussion section, para. 5).

Table 19

Higher Nomophobia in Females in Factor I & Factor IV Studies

Authors of Study	Year	Sample	Location	Instrument(s)
Ak & Yildirim	2018	146 university students	Turkey	NMP-Q
Moreno-Guerrero, Aznar-Diaz et al.	2020	1,743 high school students	Spain	NMP-Q
Moreno-Guerrero, Lopez-Belmonte et al.	2020	849 pre-service teachers	Spain	NMP-Q

Age. The independent variable of age group was tested to identify differences in nomophobia levels among teachers age 18-35, 36-50, and 51+. Hypothesis testing regarding the age group of teachers produced a marginally significant difference. Teachers' nomophobia levels in the 18-35 age group tend to be higher than teachers who are in the 36-50 and 51+ age groups, but the difference was not statistically significant. This coincides with researchers who studied nomophobia regarding age groups and found higher nomophobia levels in younger aged participants, as depicted below in Table 20. Included are both studies that utilized samples of pre-service teachers Gezgin et al. (2017) and Moreno-Guerrero, Lopez-Belmonte, et al. (2020). These researchers found that as pre-service teachers' mean age decreases, reported levels of nomophobia increase, concluding that the youngest (below age 20) pre-service teachers have the highest mean level of nomophobia. Seven out of nine studies in Table 20 utilize homogeneous samples

of students; however, the study conducted by Musa et al. (2017) was comprised of 252 respondents of all ages. Researchers found that younger people were more likely to have nomophobia and were more at risk for nomophobia to reach pathological levels (Musa et al., 2017).

Table 20

Younger Ages with Higher Levels of Nomophobia Studies

Authors of Study	Year	Sample	Location	Instrument(s)
Argumosa-Villar et al.	2017	242 high school students	Spain	MPIQ
Darvishi et al.	2019	100 medical students	Iran	Ad hoc questionnaire
Dasgupta et al.	2017	608 university students	Iran	NMP-Q
Gezgin et al.	2017	818 pre-service teachers	Turkey	NMP-Q
Gezgin et al.	2018	929 high school students	Turkey	NMP-Q, IAS
Gutierrez-Puertas et al.	2019	258 university students	Spain/Portugal	NMP-Q
Moreno-Guerrero, Lopez-Belmonte et al.	2020	849 pre-service teachers	Spain	NMP-Q
Musa et al.	2017	252 people of various ages	Malaysia	Ad hoc questionnaire
SecureEnvoy	2012	1,000 employed adults	UK	Ad hoc questionnaire

Note. MPIQ = Mobile Phone Involvement Questionnaire. IAS = Internet Addiction Scale.

In this current study, further analysis identified a difference in nomophobia levels pertaining to the age group in three out of four underlying factors. The youngest group of teachers (18-35) were identified as more nomophobic than older teachers as measured by Factor II, the fear of losing connectedness, Factor III, the fear of being unable to access information, and Factor IV the fear of losing convenience. Unfortunately, most of the research studies to date have been conducted utilizing students, which naturally creates a relatively homogeneous age group. A study conducted by Moreno-Guerrero, Aznar-Diaz, et al. (2020) utilizing a sample of 1,743 students in Spain between the ages of 12 and 20 found the respondents' highest levels of nomophobia were related to Factor I, the

fear of being unable to communicate. However, there was no overall difference in levels of nomophobia found regarding age. Likewise, a study of 537 young adults from Turkey conducted by Yildirim et al. (2016) found that 42.6% of students were significantly nomophobic. These young adults were mostly concerned with Factor I, the fear of losing communication, and Factor III, the fear of being unable to access information. However, this study found no significant overall difference in nomophobia levels based on age (Yildirim et al., 2016). Further research is necessary involving samples with greater age diversity in order to determine how age affects nomophobia and the underlying factors of nomophobia.

School-level taught. The independent variable of school-level taught was tested to identify differences in nomophobia levels among early childhood/elementary teachers, middle school teachers, and high school teachers. Hypothesis testing regarding the school-level taught produced a significant difference. Teachers' nomophobia levels in the early childhood/elementary group were significantly higher than middle school and high school teachers. Furthermore, in the additional analyses section, the early childhood/elementary teachers were found to have significantly higher levels of fear in all of four factors. Unfortunately, at this time no published research was available to compare the nomophobia reported by teachers who work at different school-levels.

Conclusions

The following section includes final comments regarding the current study on nomophobia in private school teachers from Kansas and Missouri. Implications for action regarding the significant results of the study are given. Also, suggestions for future research are explored. Concluding remarks complete the section.

Implications for action. There are definitely two perspectives on the educational potential of smartphone use in the classroom. One is offered by Liu et al. (2009), who stated that the use of mobile devices in a classroom offers more educational potential than just access to resources. The second perspective on smartphones' educational usage is that more smartphone use in classrooms creates more dependence, and thus more emotional issues (Twenge et al., 2018). Nomophobia is one of those concerns. According to Eyyam and Yaratan (2014), the ever-growing challenge is to find a healthy balance of technology to maximize learning and minimize distraction. As policies and procedures are created regarding smartphone usage in the classroom, this study's findings show that the teacher population's nomophobia is an important factor to consider.

Hattie's (2012) research on visible learning contained the overall key idea that leaders of schools and teachers should continually be aware of the impact on students. Decisions regarding policies, procedures, and classroom approaches, according to Hattie (2012), should be made directly from the evidence of this impact. The current study's contributions regarding teacher levels of nomophobia may provide a new element to Hattie's visible learning and classroom impact worthy of consideration by school administration.

According to Dixit et al. (2010), nomophobia is associated with a smartphone addiction disorder that provokes physical and psychological dependency symptoms. If teachers are distracted and anxious because of experiencing withdrawal symptoms from smartphones or with attention divided between technology and children, then either scenario may impede students' educational success. Identifying and measuring any outside force which may impede student achievement is of great importance. Therefore,

the measurement of nomophobia in teachers and the identification of demographic risk factors is an area worthy of consideration.

According to the current study, teachers are indeed at risk of nomophobia. Administrators must be aware of and mitigate this risk by providing professional development regarding nomophobia to faculty, paying special attention to younger, female, early childhood and elementary teachers. The administration must also be aware of the specific fears underlying nomophobia in teachers: the fear of being unable to communicate and the fear of being unable to access information. Administration teams' awareness of these particular areas of concern may guide the implementation of policies and procedures to raise the faculty's comfort level regarding these areas and provide appropriate boundaries teachers can successfully follow.

Also, applications and software for schools are important parts of the framework of any district. As more software applications are created and purchased by schools, enhanced awareness of smartphone addiction is important to be factored into these decisions. Awareness of teachers' struggles with nomophobia may guide the administration in a healthy and balanced approach to the purchase and implementation of new technology for teachers and classrooms.

Hopefully, this study raises faculty, staff, and administrative awareness regarding digital literacy in classrooms, especially regarding smartphone addiction. Digital addiction has been a focus of research for years regarding students, but the danger for adults is also a concern. More information regarding teacher nomophobia may be an important step for future recruitment and sustainment of a healthy and happy teacher workforce.

Recommendations for future research. Although this current study identified important findings regarding teachers' nomophobia, certain cautions should be noted since this study was conducted during the COVID-19 pandemic, one month after all schools across the country were closed and learning moved online. Schools that originally agreed to partake in the study could not fulfill this obligation because of the crisis. Thus, the sample size was smaller than originally planned, at least partially due to the stress teachers experienced in the Spring of 2020 as all classrooms quickly moved online. Finally, this unprecedented time in teachers' lives was certainly filled with anxiety and should be considered regarding the findings.

Future research will inevitably reveal the extent of smartphone addiction and nomophobia on teachers, classrooms, and student learning. A replication of this study during face-to-face instructional circumstances is recommended in order to compare results. Also, a similar study using the NMP-Q to assess nomophobia levels of public-school teachers is recommended including considerations for different teacher policies and procedures regarding personal technology usage. Furthermore, identical studies conducted in rural, urban, and suburban schools are recommended to identify differences in teachers' nomophobia levels based on school location.

Additional studies should seek to identify if teacher nomophobia may possible impact students or the classroom environment. Initial steps toward this goal would include a study to measure teacher nomophobia, report frequency of smartphone usage in class, and analyze how teachers use smartphones in the presence of students: personal use, work-related use, or pedagogical use. Other areas of interest for future research would be to measure student achievement based on variables such as levels of

nomophobia and teacher distraction, school policies regarding staff cell phone usage and nomophobia, or levels of teacher nomophobia related to sick days or mental health diagnoses. The research opportunities are vast.

Concluding remarks. The Internet provides a seemingly limitless amount of technology to aid in discovery within the modern classroom. However, the current study's findings are certainly worth considering as technology becomes more specialized, more accessible, and personal. Smartphones, in 2021, are seen as more of a necessity than a luxury. Finding the key that unlocks the appropriate integration of smartphones in the areas of work, family, and the classroom is integral to creating balance. Further research is necessary in order to guide the future of society to this much needed technological homeostasis.

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Appendices

Appendix A: ISACS Permission to Use Name

Permission to use Name "ISACS"

Alyssa Boyer <alyssa.boyer@[redacted]> Sun, Aug 30, 1:36 PM (6 days ago)

to info

Hello --

My name is Alyssa Boyer, and I am completing my EdD in Educational Leadership. My research study involved a request to the administration of all ISACS accredited private schools in Kansas and Missouri to survey their teachers regarding Nomophobia (No Mobile Phone Phobia). My career has been in private schools, and very little to no research can be found regarding private schools -- this is why I chose to complete my research within this realm. May I have permission to use the name ISACS in my paper as I describe the ISACS accredited schools surveyed? I am still in the process of writing, but here is my working title as of now: Independent Schools Association of the Central States Accredited Private School Teachers' Level of Nomophobia

[redacted]

Alyssa Boyer M.Ed, LCPC

Head of Lower School

[redacted]

Responding to Your Query Inbox ×

Mary Menacho <mary@isacs.org> Mon, Aug 31, 6:33 PM (5 days ago)

to me

Dear Alyssa,

Mary Menacho, here. I'm the Executive Director at ISACS and am responding to your question about using ISACS's name in your dissertation. In general, yes, you are welcome to use the name. Thank you for checking in with us on this.

Wishing you well,

Mary

Appendix B: Email to Heads of ISACS Accredited Schools in KS and MO

Hello Dr./ Mr./ Mrs. _____,
I am Alyssa Boyer, the Lower School Head from [redacted] in [redacted] Kansas (ISACS accredited). I am completing my EdD and would certainly appreciate your help with my Dissertation. I have chosen to survey teachers from ISACS accredited schools in Kansas, Nebraska & Missouri. I am using the NMP-Q (Nomophobia Questionnaire) which is a 20 question survey regarding a person's feelings when they are not in connection with their cell phone. The study is anonymous. Below is my survey link which includes the NMP-Q and minimal demographic information. **https://www.psytoolkit.org/cgi-bin/psy2.5.4/survey?s=p3phQ**

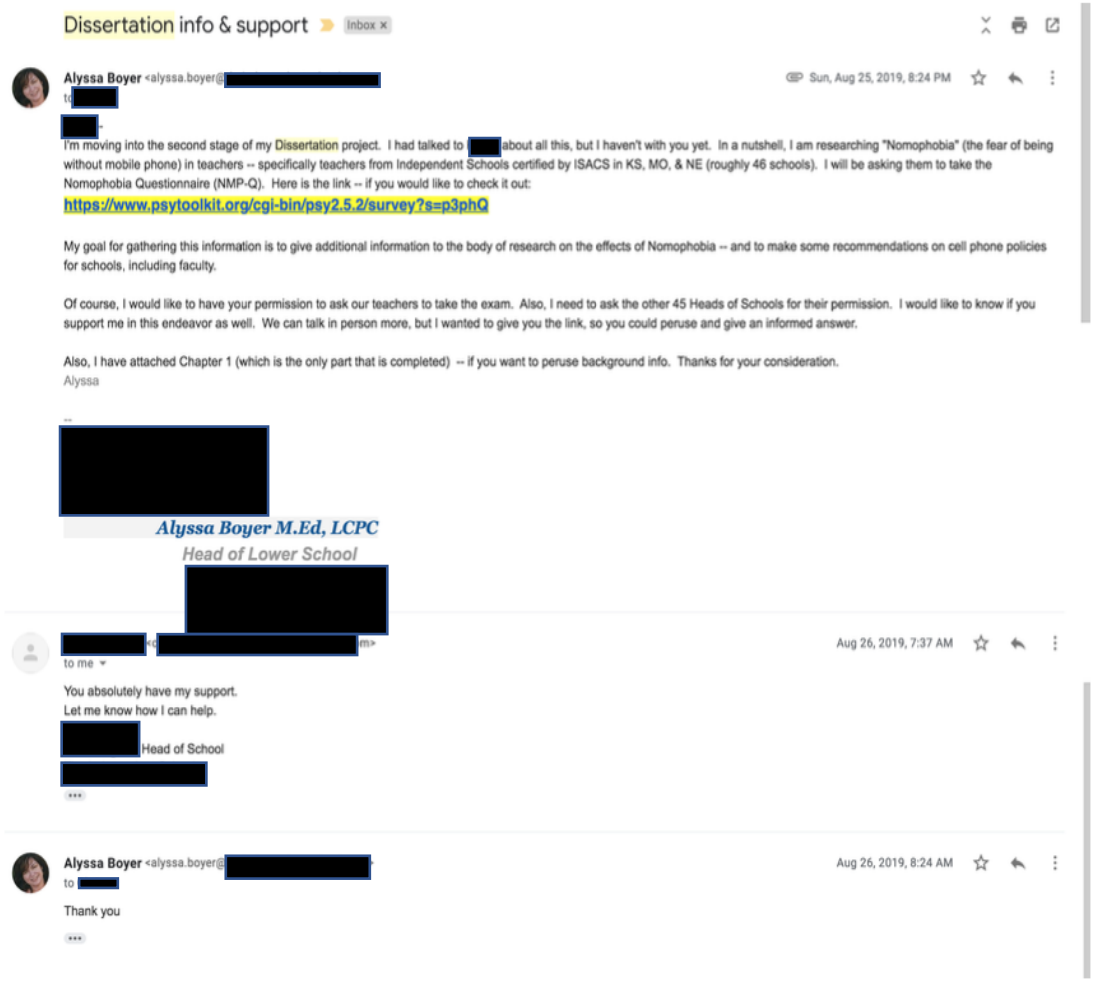
My goal is to add to the growing cell phone usage literature from the perspective of private school teachers in order to make informed research based decisions on school cell phone policies which are successful not only for students, but faculty as well. Most current literature is based on large public school districts where policies are made with little connection to the classroom teachers. I feel it is time that private schools had a voice.

This is my preliminary step to determine if I will have enough participation. If so, I will be conducting the actual survey within the next 6 months. If I have your support, please just reply to this email with direction as to whom I should contact when I enter the survey phase. I will proceed in accordance to your directions. Thank you for your consideration.

Kind Regards,
Alyssa

Appendix C: Emails from ISACS Heads of Schools in KS and MO

School A



Dissertation info & support Inbox ×

Alyssa Boyer <alyssa.boyer@[redacted]> Sun, Aug 25, 2019, 8:24 PM

to [redacted]

[redacted],

I'm moving into the second stage of my Dissertation project. I had talked to [redacted] about all this, but I haven't with you yet. In a nutshell, I am researching "Nomophobia" (the fear of being without mobile phone) in teachers -- specifically teachers from Independent Schools certified by ISACS in KS, MO, & NE (roughly 46 schools). I will be asking them to take the Nomophobia Questionnaire (NMP-Q). Here is the link -- if you would like to check it out:

https://www.psytoolkit.org/cgi-bin/psy2.5.2/survey?s=p3phQ

My goal for gathering this information is to give additional information to the body of research on the effects of Nomophobia -- and to make some recommendations on cell phone policies for schools, including faculty.

Of course, I would like to have your permission to ask our teachers to take the exam. Also, I need to ask the other 45 Heads of Schools for their permission. I would like to know if you support me in this endeavor as well. We can talk in person more, but I wanted to give you the link, so you could peruse and give an informed answer.

Also, I have attached Chapter 1 (which is the only part that is completed) -- if you want to peruse background info. Thanks for your consideration.

Alyssa

--

[redacted]

Alyssa Boyer M.Ed, LCPC

Head of Lower School

[redacted]

[redacted] Aug 26, 2019, 7:37 AM

to me

You absolutely have my support.

Let me know how I can help.

[redacted] Head of School

[redacted]

Alyssa Boyer <alyssa.boyer@[redacted]> Aug 26, 2019, 8:24 AM

to [redacted]

Thank you

School B

[redacted]
to me

Mon, Sep 2, 2019, 8:14 AM

Hi Alyssa,

Is there a particular level (lower, middle, upper) of teacher you are targeting for this survey? Also, what percentage of our teachers would you need to take the questionnaire in order for it to be valid? We would probably make participation optional, especially because we ask our teachers to complete several other questionnaires during the course of the school year. Please let me know.

Thanks,

[redacted]

--

[redacted]

Alyssa Boyer <alyssa.boyer@[redacted]
to [redacted]

Mon, Sep 2, 2019, 11:52 AM

Thank you [redacted] for getting back to me. Participation absolutely should be optional, even for my own school -- it's just a request. I am hoping for a 60% response rate, but reality is probably going to be in the 40% range. This is why I am hoping to gather more schools, so I can at least have 250 teacher responses. The survey takes about 10 minutes, so not a significant amount of time. All levels are welcome, in fact the level someone teaches is one of my demographic questions.

Thank you again for your consideration. Please let me know if you have any more questions -- happy to answer them.
Sincerely,
Alyssa

Alyssa Boyer <alyssa.boyer@[redacted]
to [redacted]

5:08 PM (45 minutes ago)

[redacted]

Thank you again for your consideration to request that your teachers participate in my short 10 minute study regarding cell phone usage. May I count you as one of my participating schools? Thank you again for your consideration.
Alyssa Boyer

[redacted]
to me

Tue, Mar 10, 9:46 AM

Hi Alyssa,

I would be happy to share the survey link with our teachers. Do you have an email you would like to send?

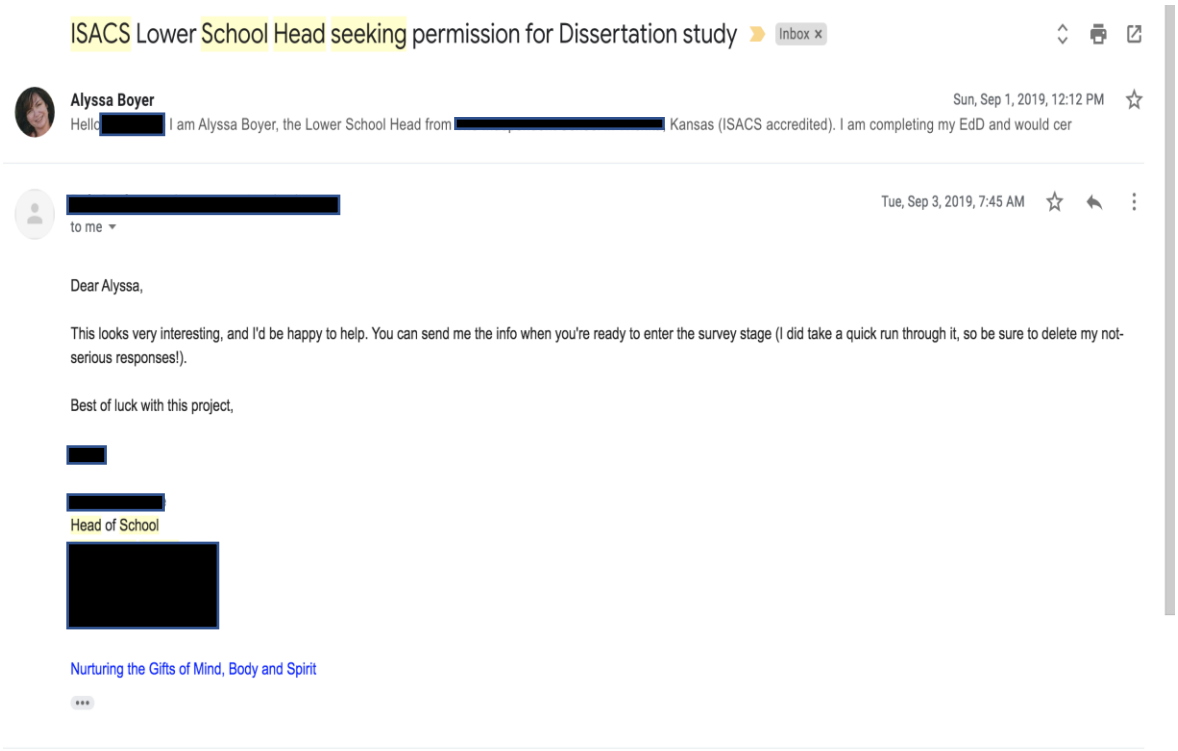
Best,

[redacted]

--

[redacted]

School C



ISACS Lower School Head seeking permission for Dissertation study Inbox ×

Alyssa Boyer Sun, Sep 1, 2019, 12:12 PM

Hello [redacted] I am Alyssa Boyer, the Lower School Head from [redacted] Kansas (ISACS accredited). I am completing my EdD and would cer

[redacted] Tue, Sep 3, 2019, 7:45 AM

to me

Dear Alyssa,

This looks very interesting, and I'd be happy to help. You can send me the info when you're ready to enter the survey stage (I did take a quick run through it, so be sure to delete my not-serious responses!).

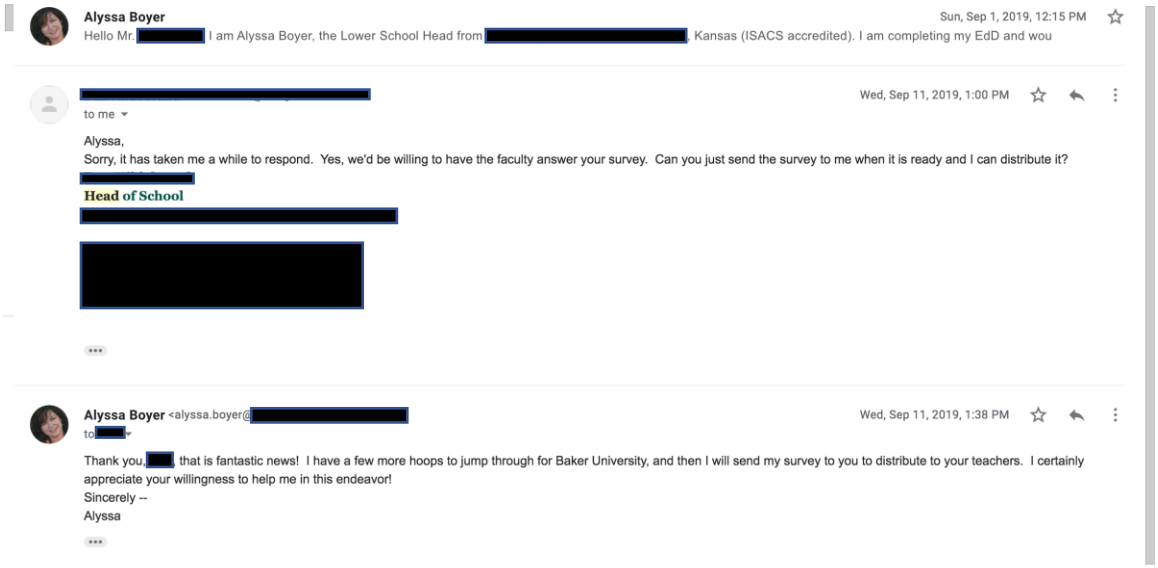
Best of luck with this project,

[redacted]

[redacted]
Head of School
[redacted]

Nurturing the Gifts of Mind, Body and Spirit

School D



Alyssa Boyer Sun, Sep 1, 2019, 12:15 PM

Hello Mr. [redacted] I am Alyssa Boyer, the Lower School Head from [redacted], Kansas (ISACS accredited). I am completing my EdD and wou

[redacted] Wed, Sep 11, 2019, 1:00 PM

to me

Alyssa,

Sorry, it has taken me a while to respond. Yes, we'd be willing to have the faculty answer your survey. Can you just send the survey to me when it is ready and I can distribute it?

[redacted]

Head of School

[redacted]

[redacted]

Alyssa Boyer <alyssa.boyer@[redacted] Wed, Sep 11, 2019, 1:38 PM

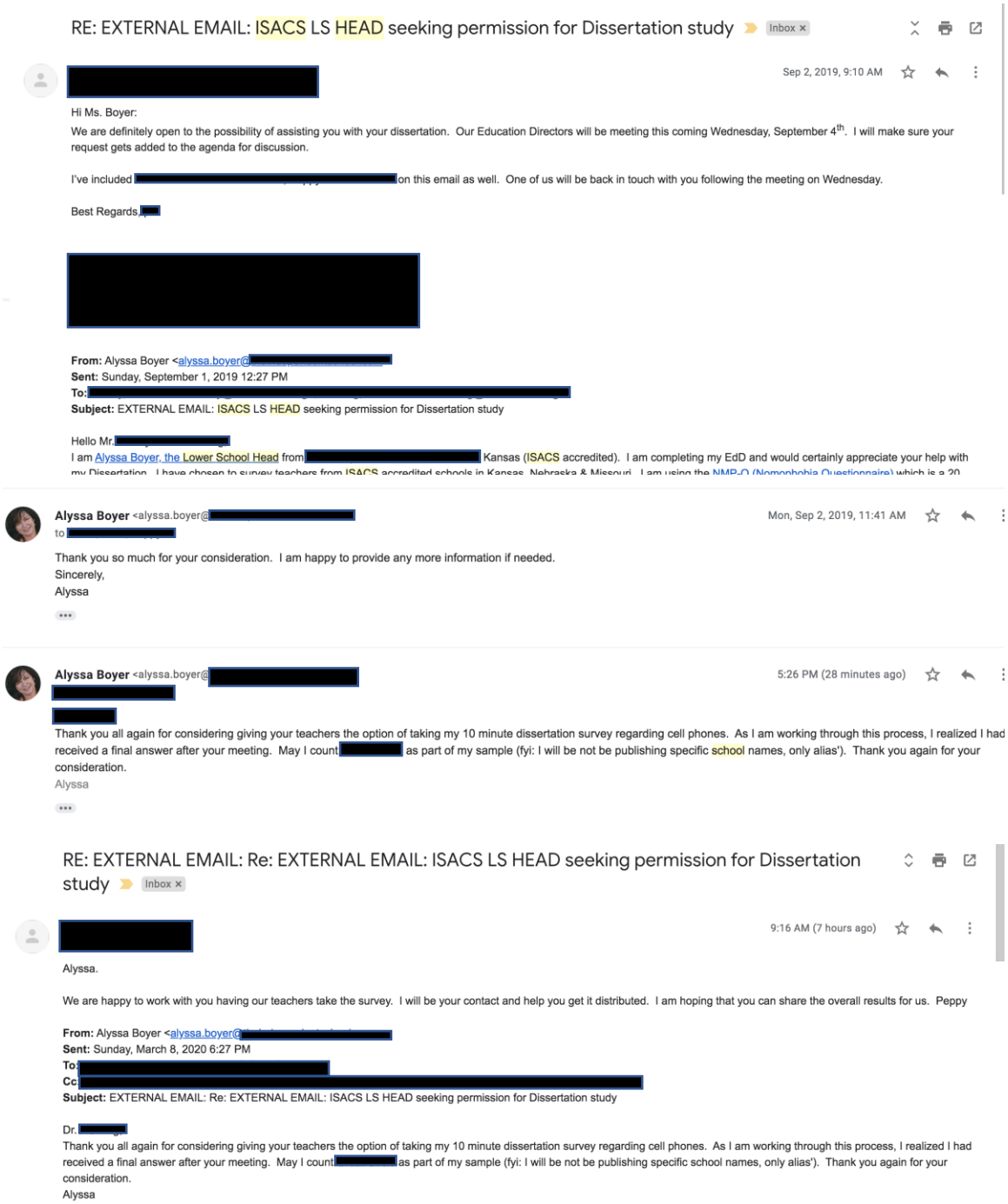
to [redacted]

Thank you, [redacted], that is fantastic news! I have a few more hoops to jump through for Baker University, and then I will send my survey to you to distribute to your teachers. I certainly appreciate your willingness to help me in this endeavor!

Sincerely --

Alyssa

School E



RE: EXTERNAL EMAIL: ISACS LS HEAD seeking permission for Dissertation study Inbox ×

[redacted] Sep 2, 2019, 9:10 AM

Hi Ms. Boyer:

We are definitely open to the possibility of assisting you with your dissertation. Our Education Directors will be meeting this coming Wednesday, September 4th. I will make sure your request gets added to the agenda for discussion.

I've included [redacted] on this email as well. One of us will be back in touch with you following the meeting on Wednesday.

Best Regards,[redacted]

[redacted]

From: Alyssa Boyer <alyssa.boyer@[redacted]
Sent: Sunday, September 1, 2019 12:27 PM
To: [redacted]
Subject: EXTERNAL EMAIL: ISACS LS HEAD seeking permission for Dissertation study

Hello Mr.[redacted]
I am Alyssa Boyer, the Lower School Head from [redacted] Kansas (ISACS accredited). I am completing my EdD and would certainly appreciate your help with my Dissertation. I have chosen to survey teachers from ISACS accredited schools in Kansas, Nebraska & Missouri. I am using the NMP-Q (Nomophobia Questionnaire) which is a 20

Alyssa Boyer <alyssa.boyer@[redacted] Mon, Sep 2, 2019, 11:41 AM
to [redacted]

Thank you so much for your consideration. I am happy to provide any more information if needed.
Sincerely,
Alyssa

Alyssa Boyer <alyssa.boyer@[redacted] 5:26 PM (28 minutes ago)
[redacted]

Thank you all again for considering giving your teachers the option of taking my 10 minute dissertation survey regarding cell phones. As I am working through this process, I realized I had received a final answer after your meeting. May I count [redacted] as part of my sample (fyi: I will be not be publishing specific school names, only alias'). Thank you again for your consideration.
Alyssa

RE: EXTERNAL EMAIL: Re: EXTERNAL EMAIL: ISACS LS HEAD seeking permission for Dissertation study Inbox ×

[redacted] 9:16 AM (7 hours ago)

Alyssa.

We are happy to work with you having our teachers take the survey. I will be your contact and help you get it distributed. I am hoping that you can share the overall results for us. Peppy

From: Alyssa Boyer <alyssa.boyer@[redacted]
Sent: Sunday, March 8, 2020 6:27 PM
To: [redacted]
Cc: [redacted]
Subject: EXTERNAL EMAIL: Re: EXTERNAL EMAIL: ISACS LS HEAD seeking permission for Dissertation study

Dr. [redacted]
Thank you all again for considering giving your teachers the option of taking my 10 minute dissertation survey regarding cell phones. As I am working through this process, I realized I had received a final answer after your meeting. May I count [redacted] as part of my sample (fyi: I will be not be publishing specific school names, only alias'). Thank you again for your consideration.
Alyssa

School F

ISACS LS Head seeking permission for Dissertation study Inbox ×

Alyssa Boyer Sun, Sep 1, 2019, 12:30 PM

Hello [redacted] I am Alyssa Boyer, the Lower School Head from [redacted] Kansas (ISACS accredited). I am completing my EdD and would ce

[redacted] Thu, Sep 19, 2019, 9:20 AM

Dear Ms. Boyer,

Our Head of School [redacted] forwarded your request about your research survey on to our division directors and me. After consulting with our team, we would like to participate in your study. As you think through the next steps, please do let us know when you are ready to roll out the survey. I will be your point of contact.

All My Best,

[redacted]

[redacted]

Assistant Head of School

[redacted]

School G

[redacted]

[redacted] Mon, Sep 2, 2019, 12:51 PM

to me

Alyssa, thanks for reaching out. If I understand properly, all I would need to do is send the survey link out to my teachers and ask them to participate when the time is right? If so then yes, I am happy to do so. Let me know if I have the details correct, many thanks.

[redacted]

--

[redacted]

Head of School

[redacted]

Alyssa Boyer <alyssa.boyer@[redacted] Mon, Sep 2, 2019, 2:00 PM

[redacted]

Thank you[redacted] for getting back to me. You are exactly correct -- no requirement of participation, just an ask. The survey will take teachers who participate about 10 minutes. If you are willing, I will let you know when Baker University has given me the "green flag" to send out the survey. I appreciate your willingness to participate. I know not all teachers will respond, but the more schools I enlist, the more reliable my research will be. Thank you, again for your consideration.

Sincerely,

Alyssa

[redacted] Mon, Sep 2, 2019, 2:09 PM

to me

Totally willing- good luck and keep me posted!

[redacted]

Sent from my

Alyssa Boyer <alyssa.boyer@[redacted] Mon, Sep 2, 2019, 6:46 PM

to [redacted]

Wonderful! Thank you!

Reply Forward

School H

[redacted]

Alyssa Boyer M.Ed, LCPC

Head of Lower School

[redacted]

[redacted] Tue, Sep 3, 2019, 8:52 AM

to me

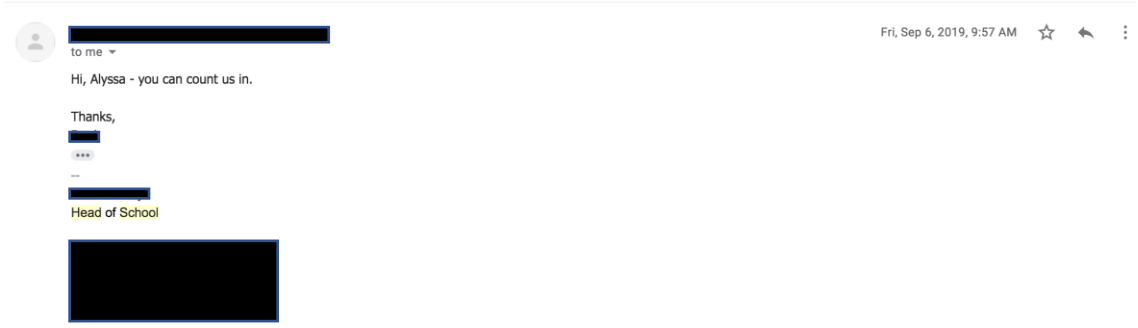
[redacted] would be happy to help.

[redacted]

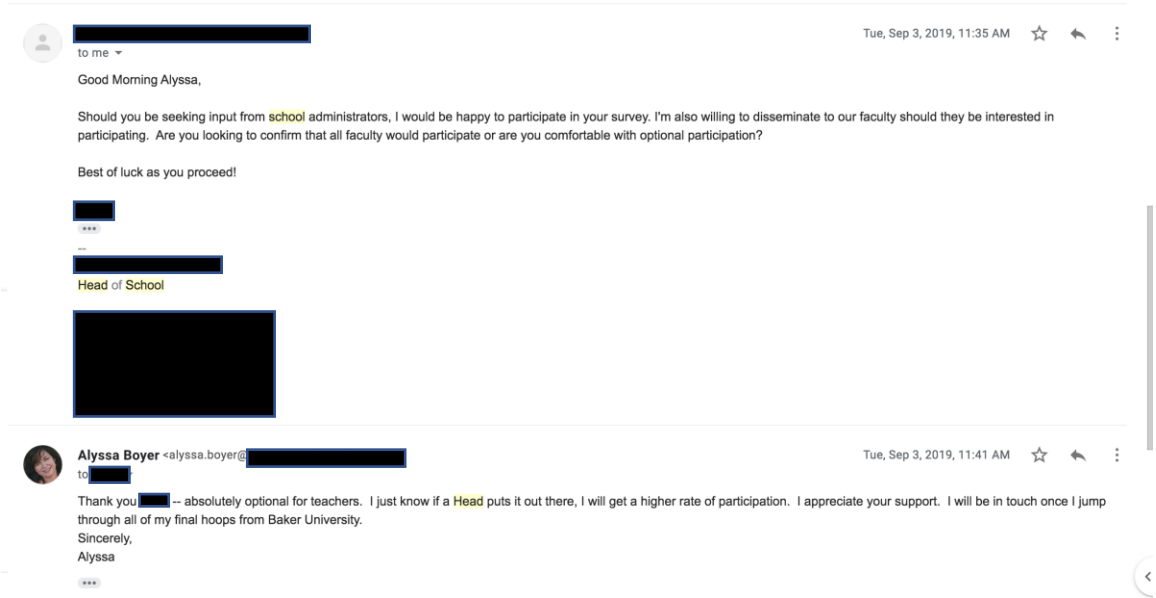
Head of School

[redacted]

School I


[redacted]
to me
Fri, Sep 6, 2019, 9:57 AM
Hi, Alyssa - you can count us in.
Thanks,
[redacted]
Head of School
[redacted]

School J


[redacted] Tue, Sep 3, 2019, 11:35 AM

to me

Good Morning Alyssa,

Should you be seeking input from school administrators, I would be happy to participate in your survey. I'm also willing to disseminate to our faculty should they be interested in participating. Are you looking to confirm that all faculty would participate or are you comfortable with optional participation?

Best of luck as you proceed!

[redacted]

--

[redacted]

Head of School

[redacted]

Alyssa Boyer <alyssa.boyer@[redacted] Tue, Sep 3, 2019, 11:41 AM

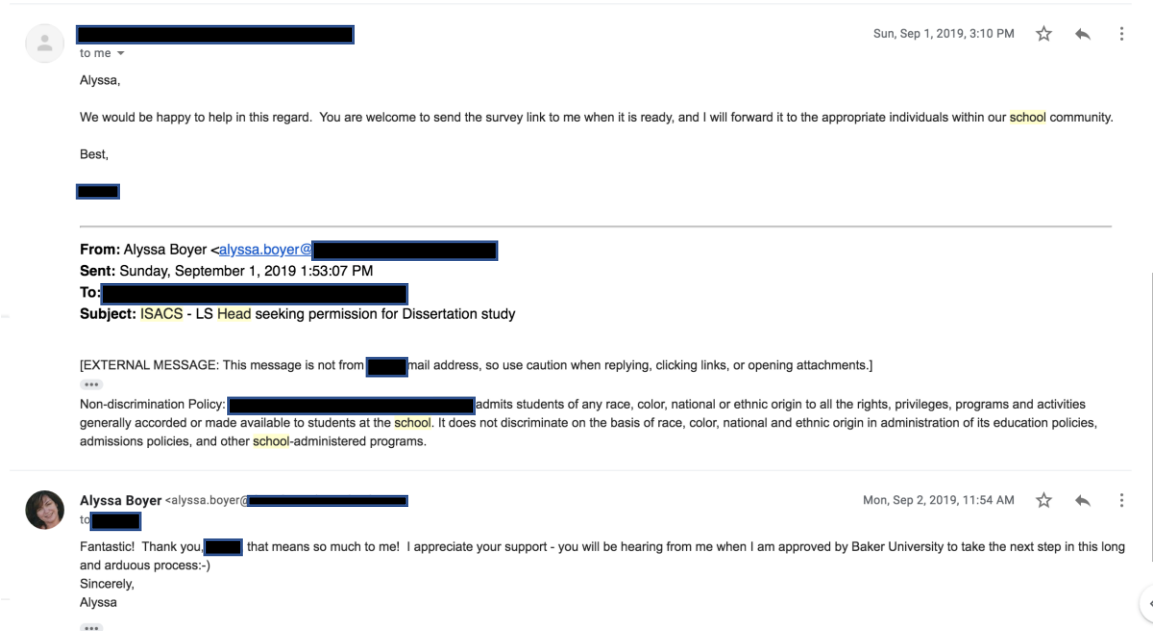
to [redacted]

Thank you [redacted] -- absolutely optional for teachers. I just know if a Head puts it out there, I will get a higher rate of participation. I appreciate your support. I will be in touch once I jump through all of my final hoops from Baker University.

Sincerely,

Alyssa

School K



[redacted] Sun, Sep 1, 2019, 3:10 PM

to me

Alyssa,

We would be happy to help in this regard. You are welcome to send the survey link to me when it is ready, and I will forward it to the appropriate individuals within our school community.

Best,

[redacted]

From: Alyssa Boyer <alyssa.boyer@[redacted]
Sent: Sunday, September 1, 2019 1:53:07 PM
To: [redacted]
Subject: ISACS - LS Head seeking permission for Dissertation study

[EXTERNAL MESSAGE: This message is not from [redacted]mail address, so use caution when replying, clicking links, or opening attachments.]

Non-discrimination Policy: [redacted] admits students of any race, color, national or ethnic origin to all the rights, privileges, programs and activities generally accorded or made available to students at the school. It does not discriminate on the basis of race, color, national and ethnic origin in administration of its education policies, admissions policies, and other school-administered programs.

Alyssa Boyer <alyssa.boyer@[redacted] Mon, Sep 2, 2019, 11:54 AM

to [redacted]

Fantastic! Thank you, [redacted] that means so much to me! I appreciate your support - you will be hearing from me when I am approved by Baker University to take the next step in this long and arduous process:-)
Sincerely,
Alyssa

School L

[redacted]

Alyssa Boyer <alyssa.boyer@[redacted]> Mon, Sep 2, 2019, 11:56 AM

to [redacted]

Thank you so much for your consideration! I am happy to answer any questions, as well. Have a great weekend!
Sincerely,
Alyssa

[redacted] Tue, Sep 3, 2019, 8:12 AM

Alyssa,

Thanks for reaching out. I'm happy to send a survey out to our teachers when you have it ready.

[redacted]

Appendix D: Permission to Use NMP-Q

Permission to use your NMP-Q Inbox ×

Alyssa Boyer <alyssa.boyer@[redacted]
to caglar.yildirim

Feb 13, 2019, 4:34 PM

Dr. Yildirim --
I am working on my dissertation on cell phone dependency as related to test scores. I would like to utilize your NMP-Q survey in my work. However, I need your permission in order to move forward. Would you allow me to use your work? Please let me know. Thank you.
Alyssa Boyer

[redacted]

Alyssa Boyer M.Ed, LCPC
Head of Lower School
[redacted]

Caglar Yildirim <caglar.yildirim@oswego.edu>
to me

Wed, Feb 13, 2019, 5:33 PM

Hello,

This is an automated message in response to your inquiry regarding my research on nomophobia. If you are writing to seek permission to use the Nomophobia Questionnaire in your research, this message serves as my permission. Thus you can use the NMP-Q in your research projects.

More information regarding the questionnaire, along with the items and the scoring guide, are available at the following page:
http://cs.oswego.edu/~caglar/#nomophobia

Thank you for your message and interest.

All the best,
Caglar Yildirim

--

Caglar Yildirim, PhD
Assistant Professor of Human Computer Interaction
422 Shineman Center
Department of Computer Science
State University of New York at Oswego
Oswego, NY 13126
caglar.yildirim@oswego.edu
315-312-6604

--

Appendix E: Original NMP-Q

Section III: Nomophobia Questionnaire (NMP-Q)

Please indicate how much you agree or disagree with each statement in relation to your smartphone.	Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
1. I would feel uncomfortable without constant access to information through my smartphone.	O	O	O	O	O	O	O
2. I would be annoyed if I could not look information up on my smartphone when I wanted to do so.	O	O	O	O	O	O	O
3. Being unable to get the news (e.g., happenings, weather, etc.) on my smartphone would make me nervous.	O	O	O	O	O	O	O
4. I would be annoyed if I could not use my smartphone and/or its capabilities when I wanted to do so.	O	O	O	O	O	O	O
5. Running out of battery in my smartphone would scare me.	O	O	O	O	O	O	O
6. If I were to run out of credits or hit my monthly data limit, I would panic.	O	O	O	O	O	O	O
7. If I did not have a data signal or could not connect to Wi-Fi, then I would constantly check to see if I had a signal or could find a Wi-Fi network.	O	O	O	O	O	O	O
8. If I could not use my smartphone, I would be afraid of getting stranded somewhere.	O	O	O	O	O	O	O
9. If I could not check my smartphone for a while, I would feel a desire to check it.	O	O	O	O	O	O	O
If I did not have my smartphone with me,							
10. I would feel anxious because I could not instantly communicate with my family and/or friends.	O	O	O	O	O	O	O
11. I would be worried because my family and/or friends could not reach me.	O	O	O	O	O	O	O
12. I would feel nervous because I would not be able to receive text messages and calls.	O	O	O	O	O	O	O
13. I would be anxious because I could not keep in touch with my family and/or friends.	O	O	O	O	O	O	O
14. I would be nervous because I could not know if someone had tried to get a hold of me.	O	O	O	O	O	O	O
15. I would feel anxious because my constant connection to my family and friends would be broken.	O	O	O	O	O	O	O
16. I would be nervous because I would be disconnected from my online identity.	O	O	O	O	O	O	O
17. I would be uncomfortable because I could not stay up-to-date with social media and online networks.	O	O	O	O	O	O	O
18. I would feel awkward because I could not check my notifications for updates from my connections and online networks.	O	O	O	O	O	O	O
19. I would feel anxious because I could not check my email messages.	O	O	O	O	O	O	O
20. I would feel weird because I would not know what to do.	O	O	O	O	O	O	O

☺ Thank you for your participation! ☺

Appendix F: Online Survey with NMP-Q in Google Forms

Nomophobia Questionnaire (NMP-Q) (No Mobile Phone Phobia)

Please indicate how much you agree or disagree with each statement in relation to your smartphone.

1. 1. I would feel uncomfortable without constant access to information through my smartphone.

   Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

2. 2. I would be annoyed if I could not look information up on my smartphone when I wanted to do so.

   Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

3. 3. Being unable to get the news (e.g., happenings, weather, etc.) on my smartphone would make me nervous.

   Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

4. 4. I would be annoyed if I could not use my smartphone and/or its capabilities when I wanted to do so.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

5. 5. Running out of battery in my smartphone would scare me.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

6. 6. If I were to run out of credits or hit my monthly data limit, I would panic.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

7. 7. If I did not have a data signal or could not connect to Wi-Fi, then I would constantly check to see if I had a signal or could find a Wi-Fi network.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

8. 8. If I could not use my smartphone, I would be afraid of getting stranded somewhere.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

9. 9. If I could not check my smartphone for a while, I would feel a desire to check it.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

If I did not have my smartphone with me,

10. 10. I would feel anxious because I could not instantly communicate with my family and/or friends.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

11. 11. I would be worried because my family and/or friends could not reach me.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

12. 12. I would feel nervous because I would not be able to receive text messages and calls.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

13. 13. I would be anxious because I could not keep in touch with my family and/or friends.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

14. 14. I would be nervous because I could not know if someone had tried to get a hold of me.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

15. 15. I would feel anxious because my constant connection to my family and friends would be broken.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

16. 16. I would be nervous because I would be disconnected from my online identity.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

17. 17. I would be uncomfortable because I could not stay up-to-date with social media and online networks.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

18. 18. I would feel awkward because I could not check my notifications for updates from my connections and online networks.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

19. 19. I would feel anxious because I could not check my email messages.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

20. 20. I would feel weird because I would not know what to do.

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	◯	◯	◯	◯	◯	◯	◯	Strongly Agree

21. My gender is

Mark only one oval.

- ◯ Male
- ◯ Female
- ◯ Prefer not to say

22. My age is

Mark only one oval.

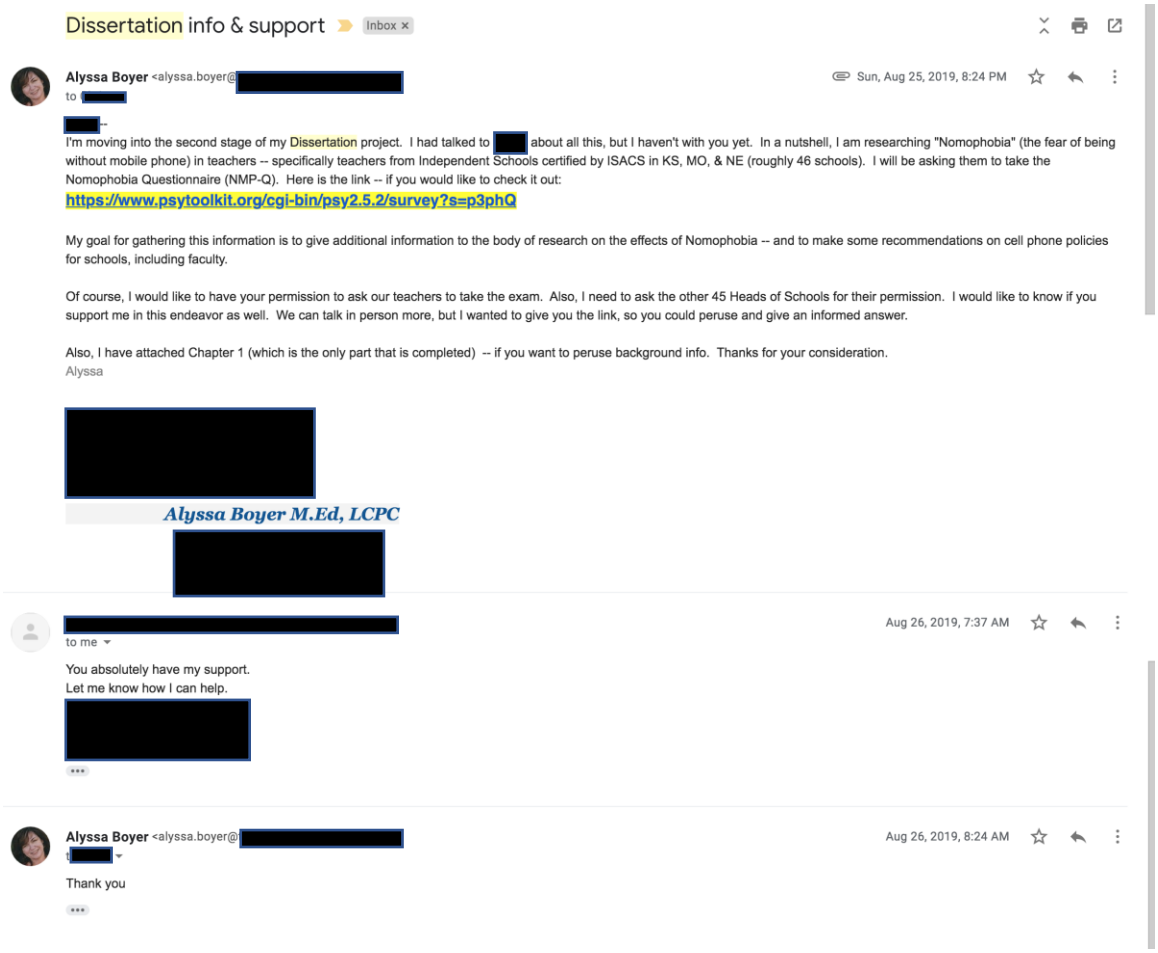
- ◯ 18-25
- ◯ 26-35
- ◯ 36-50
- ◯ 51+

23. The grade level I primarily teach is

Mark only one oval.

- ◯ Early Childhood
- ◯ Elementary (Kindergarten - 5th grade)
- ◯ Middle School (6th grade - 8th grade)
- ◯ High School (9th grade -12th grade)

Appendix G: Permission to Originate Study



Dissertation info & support Inbox ×

Alyssa Boyer <alyssa.boyer@[redacted]
to [redacted]

Sun, Aug 25, 2019, 8:24 PM

[redacted]--
I'm moving into the second stage of my Dissertation project. I had talked to [redacted] about all this, but I haven't with you yet. In a nutshell, I am researching "Nomophobia" (the fear of being without mobile phone) in teachers -- specifically teachers from Independent Schools certified by ISACS in KS, MO, & NE (roughly 46 schools). I will be asking them to take the Nomophobia Questionnaire (NMP-Q). Here is the link -- if you would like to check it out:
https://www.psytoolkit.org/cgi-bin/psy2.5.2/survey?s=p3phQ

My goal for gathering this information is to give additional information to the body of research on the effects of Nomophobia -- and to make some recommendations on cell phone policies for schools, including faculty.

Of course, I would like to have your permission to ask our teachers to take the exam. Also, I need to ask the other 45 Heads of Schools for their permission. I would like to know if you support me in this endeavor as well. We can talk in person more, but I wanted to give you the link, so you could peruse and give an informed answer.

Also, I have attached Chapter 1 (which is the only part that is completed) -- if you want to peruse background info. Thanks for your consideration.
Alyssa

[redacted]
Alyssa Boyer M.Ed, LCPC
[redacted]

[redacted]
to me

Aug 26, 2019, 7:37 AM

You absolutely have my support.
Let me know how I can help.
[redacted]

Alyssa Boyer <alyssa.boyer@[redacted]
to [redacted]

Aug 26, 2019, 8:24 AM

Thank you

Appendix H: IRB Approval Letter

BAKER UNIVERSITY
Own Confidence

Baker University Institutional Review Board

April 17th, 2020

Dear Alyssa Boyer and Justin Hawpe,

The Baker University IRB has reviewed your project application and approved this project under Expedited Status Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

Please be aware of the following:

1. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
2. Notify the IRB about any new investigators not named in original application.
3. When signed consent documents are required, the primary investigator must retain the signed consent documents of the research activity.
4. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.
5. If the results of the research are used to prepare papers for publication or oral presentation at professional conferences, manuscripts or abstracts are requested for IRB as part of the project record.
6. If this project is not completed within a year, you must renew IRB approval.

If you have any questions, please contact me at npoell@bakeru.edu or 785.594.4582.

Sincerely,

Nathan D. Poell

Nathan Poell, MLS
Chair, Baker University IRB

Baker University IRB Committee
Scott Crenshaw
Sara Crump, PhD
Jamin Perry, PhD
Susan Rogers, PhD

Appendix I: Email to Heads of Schools to Launch Study

Email Script for Heads to Send to Faculty

Thank you for participating in my research study. Please be assured that your participation is voluntary and completely anonymous. This is a 20 question survey with the addition of three demographic questions at the end. If any question should make you uncomfortable, feel free to not answer that question. It should take less than ten minutes to complete.

As a doctoral candidate in Educational Leadership at Baker University, I am conducting research on teachers and Nomophobia (No Mobile Phone Phobia).

Your participation is a valuable part of my research which is for academic purposes only.

If you have any questions or concerns, feel free to contact me. Overall results will be made available upon request. Thank you again for your valuable time.

CLICK HERE TO START STUDY

Alyssa Boyer Ed.D. Candidate Baker University, Graduate School of Educational Leadership email:
alyssa.boyer@[redacted]

Justin Hawpe, Ed.D.
Faculty Advisor
email: justinhawpe@fac.bakeru.edu
phone: (316) 772-0421

Appendix J: Email Examples Urging to Complete Study

Alyssa Boyer <alyssa.boyer@[redacted] Tue, May 5, 8:00 AM

to bcc [redacted]

Dear Heads & designated administrators --
I wanted to thank you for helping me gather the data I need to continue my work. I am 2/3rds of the way there. Those of you who have sent it out once already, If I could implore you to send one last push this week, for teachers who haven't had a chance to respond. Also, for those who have not sent it out yet because of all the craziness right now, if you could do so this week, I would be so grateful. I appreciate all you have done, and after this last effort -- I will be out of your hair (and inbox).
Hope to meet you all at an ISACS conference some day.
Sincerely --
Alyssa

Thank you for participating in my research study. Please be assured that your participation is voluntary and completely anonymous. This is a 20 question survey with the addition of three demographic questions at the end. If any question should make you uncomfortable, feel free to not answer that question. It should take less than 10 minutes to complete.

As a doctoral candidate in Educational Leadership at Baker University, I am conducting research on teachers and Nomophobia (No Mobile Phone Phobia).

Your participation is a valuable part of my research which is for academic purposes only.

If you have any questions or concerns, feel free to contact me. Overall results will be made available upon request. Thank you again for your valuable time.

CLICK HERE TO BEGIN SURVEY

Alyssa Boyer Ed.D. Candidate Baker University
Graduate School of Educational Leadership
alyssa.boyer@[redacted]
[redacted]

Alyssa Boyer <alyssa.boyer@[redacted] Wed, Apr 29, 3:09 PM

[redacted]

I wanted to make sure you received this email, so I apologize if this is a duplicate. Baker University has approved my study, and it is now live and ready to be forwarded to your faculty. This unprecedented, crazy time where we have been forced to educate online has enhanced the critical need for the type of information gleaned from this simple 10 minute survey. I very much appreciate your willingness to pass it along. Simply copy and paste the information below. Again, thank you for helping me complete my lifelong goal of earning my doctorate.
Kind Regards,
Alyssa

Thank you for participating in my research study. Please be assured that your participation is voluntary and completely anonymous. This is a 20 question survey with the addition of three demographic questions at the end. If any question should make you uncomfortable, feel free to not answer that question. It should take less than 10 minutes to complete.

As a doctoral candidate in Educational Leadership at Baker University, I am conducting research on teachers and Nomophobia (No Mobile Phone Phobia).

Your participation is a valuable part of my research which is for academic purposes only.

If you have any questions or concerns, feel free to contact me. Overall results will be made available upon request. Thank you again for your valuable time.

CLICK HERE TO BEGIN SURVEY

Alyssa Boyer Ed.D. Candidate Baker University
Graduate School of Educational Leadership
alyssa.boyer@[redacted]
[redacted]

Alyssa Boyer <alyssa.boyer@[redacted] Wed, Apr 29, 3:28 PM
to #All

Thank you so much to those who have completed this survey, However, if you haven't had a chance yet, would you please take 10 minutes and do this for me. Thank you so very much!

Please be assured that your participation is voluntary and completely anonymous. This is a 20 question survey with the addition of three demographic questions at the end. If any question should make you uncomfortable, feel free to not answer that question. It should take less than 10 minutes to complete.

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