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The Consequences of and Factors Affecting Perceptions and Use of Technology

Patrick Gardner
Union College - Schenectady, NY

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By

Patrick Gardner

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ABSTRACT

GARDNER, PATRICK

Advisors: Professor Grigsby and Professor Walker

Technology and its impacts on society are the subject of constant debate. Technology has been influential in creating a global economy, which has given people more time for leisure activities. However, technology has also produced unintended by-products, including issues such as a dependence on foreign nations for commodities like food. Analyzing both the positive and negative consequences of technology can help people better understand both its regional and global impacts. In turn, this knowledge can help us make more beneficial choices regarding how we use technology moving forward.

This thesis explores how technology positively and negatively affects society, and will also examine how people use technology, as well as the things that impact how people perceive technology. The technologies being examined include smartphones, household technology (appliances), genetically modified crops (GMOs), and other technologies such as the Internet and social media. These technologies will be contextualized in several different aspects of life, (such as connectivity, personal privacy, work-family conflict, education and quality of health) to illustrate the extent to which technology has both improved and hindered society, as well as to show that these effects often impact how people view these technologies.

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INTRODUCTION

Technology is very important to study, since it has a major impact on our daily lives. We use it to achieve goals such as scientific advancement and personal gain, as well as to acquire news and information to better understand what is going on in the world around us. However, technology can have numerous unforeseen consequences. Moreover, in an age of rampant technology use, it is often unclear what leads people to view technology a certain way and what ultimately leads them to use a specific type of technology. The intent of this study is to examine if technological perceptions and personal experience with technology lead college students to end up using a certain type of technology, or if other factors are more important in a student's decision of what technology to use.

I used a survey to collect descriptive and exploratory information regarding Union College students' experiences with technology, their attitudes towards technology, and how they use technology. Analyzing this data will enhance our understanding of college students' relationships with technology, and how technology affects the younger generation today.

CHAPTER ONE: LITERATURE REVIEW

INTRODUCTION

The purpose of this literature review is to examine the positive and negative consequences of technology in different cultures throughout the world, and to explain how factors such as personal experience affect perceptions and use of technology. This review sets the stage for my field research on technological attitudes and usage among college students, as it will be easier to understand college students' relationship with technology if we know how society at large perceives and uses technology. Having a general understanding of technological consequences, attitudes and how people use technology is extremely beneficial. This will enhance our knowledge of the complex role that technology plays in society today, and enable us to apply this knowledge to make smarter, more informed decisions about how to use technology in the future.

I. THE EFFECTS AND PERCEPTIONS OF TECHNOLOGY

As great as technology can be, it is not without its downsides. In their article "Technology, Relationships, And Problems: A Research Synthesis", Hertlein and Webster (2008) reference English author and physicist C.P. Snow, who characterized technology as “a queer thing. It brings you great gifts with one hand, and it stabs you in the back with the other” (445).

Since the late 20th century, society has experienced an unprecedented number of technological advancements. Commodities such as smartphones, name brand household appliances and modes of communication such as texting and social media have become extremely popular with consumers. Others, such as genetically modified crops, are more controversial, and are not as widely accepted. These technologies have had a tremendous impact on society, and there are several factors that influence whether consumers use them.

The case studies for this literature review were chosen because they all exemplify issues associated with new technologies. For example, these technologies often lead to unintended yet major consequences such as work-family conflict, a higher electric bill for families, feelings of social isolation and threats to environmental safety and global food security. However, these technologies were also chosen to highlight the reality that key differences exist between them, such as how farmers who use GMOs forfeit the ability to regulate the quality of their crops; whereas users of smartphones retain their ability to choose how they use their device and communicate with others.

i. Smartphones

Smartphones are one of the most popular kinds of technology today, and are used for a wide variety of functions. Barkhuus and Polichar (2010) note that a phone is “smart” if it is capable of “incorporating multiple functions, including those of other devices such as the personal digital assistant (PDA), timer/alarm clock, GPS receiver/navigator, MP3 player, even laptop computer” (629). The researchers used semi-structured interviews and daily journals which participants kept for over three weeks to learn how people incorporated smartphones into their everyday lives. They found that several of the participants used their smartphones for social networking, so that they could stay connected to what people were up to, and receive news and information that would affect their commute to work. Participants also noted that they often used their smartphones in personal interactions, such as looking up information on Wikipedia to settle an argument. Although some people in the study did mention how their devices could be improved, they all liked their phones. That is, most participants viewed smartphones in a positive manner.

Barkhuus and Polichar also mention that several of the participants “mixed and matched” features of their phone to fit their individual needs and lifestyles. For example, one participant took photos with her camera and then uploaded them to Flickr, while another participant used the Internet to get information about an earthquake that had just occurred, and then used Twitter to describe her experience. Many of the participants used some features on their phone, but not others. These decisions allow people to make smartphones “their own”. Barkhuus and Polichar note that many participants viewed their phones as “‘‘Swiss Army knives’’ and others described them as ‘‘a loyal dog, doing just what I ask him to do” (637). They conclude that smartphones’ success can be attributed to their ability to mix, match and interconnect apps. Throughout the

article, the reader gets the sense that the sum of a smartphones' parts (its' multitude of apps and functions) are more important than the phone itself, which the researchers note could very well make the smartphone the "ultimate ubiquitous device" in the future (638).

Esther Swilley (2010) aims to discover the factors that determine why people will not use certain types of technology: in this case, a wallet phone. This is a type of cell phone "that is used for storage of all information, including identification, pictures, even airline tickets", and "a smart chip embedded in the phone will allow consumers to store as much private information as is contained in their wallet" (304). Contrary to her hypotheses, perceived ease of use and social norms did not cause people to view wallet phones positively. Instead, she found that factors such as age may have a significant impact on pessimism towards the wallet phone. In addition, people's perceptions of wallet phones are also explored. Fears of losing the device, security and privacy issues, and the fact that people feel the need to store lots of information on their cell phones were thought to be more related to losing a cell phone than losing a wallet. These fears were all found to make people view wallet phones negatively, and decreased the likelihood that they would use a wallet phone. Swilley concludes by stating that the public is currently unwilling to embrace the wallet phone, and notes that further research into the negative attitudes surrounding technology could be insightful.

Norazah (2013) examines how the social needs, social influences and convenient nature of smartphones affect college student's dependence on them. Norazah found that social needs have the greatest influence on student's reliance on smartphones, as students noted that smartphones allow them to stay connected with their friends and family. Social pressure had the second largest effect on students' dependence, as many people worry about if their friends like the brand of their smartphone, and would use a smartphone if it helped them "fit in" with others

(131). Convenience was insignificant, due in part to the speed of Internet connection and the availability of Wi-Fi to help run smartphone applications. It is also suggested that students' reliance on smartphones positively affects their purchase behavior, as they often feel insecure when the phone is not with them. Norazah suggests that academics encourage students to use smartphones to improve their learning process, and that providers of smartphones expand their functionality, so that they are more relevant for college students.

Park and Park (2014) investigate the factors that lead children to become obsessed with smartphones, and the consequences of this obsession. They state that parents who are busy working often give smartphones to their kids to take care of them. This, combined with the fact that children use these phones as toys, can often lead children to become addicted to smart-phones. Parental factors that may cause kids to become dependent on smartphones include parents' high levels of age, education and income, lenient parenting techniques and parents' positive attitudes towards smartphones. Regarding child factors, children are more likely to become addicted to smartphones if they are younger, have fewer siblings, are boys, or do not attend school. Consequences of smartphone addiction in children include mental and physical problems; namely, a greater likelihood of depression, lack of control, damage to vision and hearing, ADHD, and obesity. To mitigate these problems and ensure children are healthy, Park and Park suggest numerous measures, such as that parents spend more time with their kids, and that pre-schools and kindergarten teach kids not to use smartphones too much.

Pan et al. (2014) intend to better comprehend the reasons why people use smartphone mobile services in Taiwan. In their study, the researchers asked participants to rank fifteen reasons for utilizing smartphones. They found that price was the most important antecedent, because the high cost of smartphones prevents people from using them. Anticipation of

performance came in second, as “Many early adopters of smart phones wanted to enhance their working efficiency and communication convenience by using smart phones” (1111). Pan et al. go on to note that people may need the multi-functionality of smartphones if they do not like their current phone; however, “many customers still have usable feature phones and do not have an urgent need to get a new phone” (1111). Pan et al. mention that their data can help people better understand “consumer views toward smart phones, provide direct understanding of the views and feelings of consumers’ under psychological and environmental interaction, and further divide into the use factors into three stages for exploration: motivation to use, intention to use and actual usage behavior” (1111).

Seshadra and Chandrasekaran (2013) discuss the impact of consumers’ acquisition and usage on their disposition behavior for cell phones, and note that most respondents owned at least two mobile phones. They focus mainly on when and why people get rid of their mobile phones, even though their phones still work. The study focuses on residents from Pondicherry, India. The researchers discovered that most people owned more than one phone, for reasons such as “maintaining separate phones for office and personal use, to maintain privacy of the main cell number that is circulated only to close family members and friends”, and to share their phones with relatives who do not have a phone (3598). In terms of factors that affect mobile phone disposition, the key conclusion is that “Possession attachment and emotional bonding with the possession have strong impacts on the disposition of mobile phones. People with low level of possession attachment to their mobiles and those for whom mobiles hold a low emotional significance tend to dispose phones at a faster pace” (3600). Additionally, 61% of participants who wanted their phone to last longer than its expected lifespan were found to dispose their phones within two years. Seshadra and Chandrasekaran conclude by noting that “the mobile

phone has the credentials to revolutionize the communication, culture, commerce and the everyday lives of people" (3600). Research into the disposition behavior of mobile phones can be highly beneficial, as it has the potential to reduce environmental issues resulting from e-waste from mobile phones, and because it can help companies better promote customized phones to satisfy the needs of customers in developing countries.

Sek et al. (2012) attempt to examine the changes in users' beliefs and behavioral intentions to use smart phones for learning purposes. The sample for this study was chosen from people who enrolled in a Digital Systems class, which resulted in a sample of 60 potential smart phone users. Respondents initially sat in on a short in-class introduction to the advantages of smart phones for mobile learning, and then were asked to complete a survey "for pre-usage smart phone perceptions and intentions" (437). Later, participants investigated the learning contents with smart phones, and then completed a survey about their perceptions of smart phones. The key finding here is that "hand-on session played an important role that influenced the formation and gradual change of users' beliefs and intentions to use smart phone for learning"; as the measurement of things such as attitude and behavioral intention were much higher after the hands-on session (438). The researchers conclude by noting that initial exposure to smart phones and hands on training with smart phones were successful in changing people's beliefs and intent to use a smart phone; and suggest that educators implement persuasive techniques and hands-on training to help users establish positive beliefs and attitudes toward smart phones.

In summary, prior research on smartphones has focused on the different ways in which people use smartphones, as well as the reasons why people choose or do not choose to use a smartphone. Barkhuus and Polichar (2010) state that people use smartphones to stay connected to their friends, and to look up information to settle arguments in personal interactions with their

peers. Barkhuus and Polichar also note that smartphones have been very popular with consumers, as they allow the user to mix, match and interconnect different features, and truly make the smartphone “their own”. Swilley (2010) found that factors such as age and security and privacy issues often keep people from using a wallet phone, and ultimately decrease the likelihood that someone will use a wallet phone. Among college students, Norazah (2013) found that social needs and social pressure have the greatest influence on students’ reliance on smartphones, while Park and Park (2014) note that children often become dependent on smartphones due to parental factors such as high levels of age and income; and child factors such as having fewer siblings or not attending school. Pan et al. (2014) discovered that people are very likely to use a smartphone if it has a low price and can help them improve their work efficiency and communication, while Seshadra and Chandrasekaran (2013) found that people are likely to stop using a smartphone if it is of little emotional significance to them. Finally, Sek et al. (2012) found that hands-on exposure to smartphones for learning purposes can improve users’ attitudes towards smartphones, and believe hands-on training should continue to be implemented to help smartphones become more widely accepted in society. These are all important points, as they help people better understand the various roles of smartphones in society today, the benefits and drawbacks of smartphones, and why people will or will not use this device.

ii. Household Appliances

Like smartphones, home appliances can have many positive and negative effects on families, and their use is subject to many outside factors.

According to Brown (2008):

> Household technology encompasses more than personal computers, including both the technologies that people use to do work and be entertained as well as the wired and wireless access that enables those technologies to connect to the Internet and interact with people and companies in a global arena (397).

Brown examines how technology comes into the household by researching the adoption, use and impacts of technology, and discusses people's views on the ways in which technology can be both helpful and detrimental on a personal level. On the positive side, Brown notes that "connectivity and Internet use have become central aspects of home technology use" (399). Many people have adopted and used the Internet because it can help them stay connected to others and up-to-date with news. However, technology also raises issues of relationship development, trust and privacy of information; which is often evident in cyber-bullying. Brown also references the HomeNet project, which found that "increased Internet use could lead to social isolationism---reduced communication with other household members and even depression and loneliness" (399).

Brown also notes that technology can have unintended, yet very real, consequences. For example, mobile devices like the Blackberry can create work-family conflict, such as parents secretly using the device, and family members feeling left out. Brown suggests that future

research attempt to understand the intended and unintended consequences of technology, and believes that researchers should rethink the techniques they use to better understand and explain the multitude of outcomes associated with technology.

Donoghue et al. (2011) seek to uncover the factors that lead people to buy household appliances. They examine factors such as the functional utility of appliances, status-indicating factors (such as the appliance's color and style), quality indicators, and the cost and affordability of the appliance. This study found that people think it is more important to receive information regarding the performance and functionality of appliances rather than on environmental issues. Gender and age were also highly likely to influence people's need for information on the functionality and performance of appliances: women and older consumers were found to need this information more than men and younger consumers. However, the researchers found that "functional utility" of household appliances was the strongest factor that would cause someone to buy an appliance (i.e., if the appliance would last without causing problems, or if it was from a reliable brand). Donoghue et al. believe that helpful and relevant information should be provided to consumers, as this would help "enhance informed buying decisions, minimize consumers' functional risk perception and reduce negative post-purchase judgments" (44).

Tewathia (2014) examines the factors that affect households' electricity consumption during summer, winter and fair weather in Delhi, India. These include household earnings, family size, house size, time spent out by family members, and high levels of education. However, Tewathia also found that the number of appliances in a family is a very significant factor in household electricity consumption. The families in this study have a conversation before buying an appliance, and they consider the appliance's cost, quality and energy consumption before making a purchase: "70.6 percent households disagree that buying an

appliance is not a family decision" (347). Tewathia's findings indicate a positive relationship between the amount of home appliances and high levels of electricity use. For example, "as temperature rises, more electricity is consumed as a result of usage of cooling appliances like AC, fridge, Cooler etc." (347). These results clearly indicate that the use of household technologies can raise levels of electricity consumption, which could potentially lead to negative effects for families, such as a higher electric bill.

Abeliotis et al. (2011) study the factors that affect people's preferences towards ownership of household appliances in Limassol, Cyprus; and how socio-demographic traits affect these attitudes. Participants were asked to evaluate the criteria when buying new appliances, such as a TV, washing machine, dishwasher, or a refrigerator. Abeliotis et al. discovered that most respondents consider the energy efficiency of an appliance to be the most important factor when purchasing a new appliance. Women and college graduates were found to be more likely to use energy-efficient appliances, and "women stated that they would prefer an energy-saving washing and dishwasher machine to a greater degree than men" (137). Additionally, the researchers note that "higher income groups place more emphasis on energy efficiency" (137). Levels of household income and family size are also mentioned as important factors that contribute to the likelihood of buying an appliance.

Along these same lines, Kumar (2015) seeks to uncover the factors that influence people's home appliance preferences and their purchasing patterns, as well as the factors that affect people's attitudes towards different appliance brands. This study was conducted among 150 people in Ludhiana, India, and asked participants about the factors that influenced them to buy certain brands of products, such as washing machines, TVs, and refrigerators. Kumar found that factors such as advertisements and the brand name of the appliance were highly influential

in the selection of grinders, washing machines and TVs. Furthermore, “family members, friends and relatives, and sales representatives to some extent” also had an impact on consumers’ brand preference of appliances (367).

Amutha and Sulthana (2011) provide insight into consumers’ attitudes towards replacing home appliances. Their data comes from questionnaire responses gathered from 140 participants in Chennai city, India, most of whom were women. The appliances examined in this paper are TVs, washing machines and refrigerators. Amutha and Sulthana found that people in Chennai city are very aware of the different brands of household appliances, and consumer attitudes change for various reasons, such as improved technology, the influence of family and friends and advertisements. Many survey respondents noted that they replaced their TV because newer TVs have updated technology and a more improved status, and they changed their washing machines because it made their work easier, boosted their status, and because new discounted prices appealed to them. Participants noted that the influence of family and friends as well as advertisements of added components lead them to replace their current refrigerator. Amutha and Sulthana imply that advertisements may have the greatest impact on causing consumers to replace their current appliances, as an advertisement “creates choices and various alternatives for the customer to choose the best among many home appliances” (120).

Matsumoto (2016) explores the ways in which socioeconomic factors affect how the Japanese use household appliances. Matsumoto utilizes micro-level data from the National Survey of Family Income and Expenditure (NSFE) in Japan to answer this question. The NSFE reports that the socioeconomic structures of households have a large effect on how people use appliances, such as how “a household with many members will use a washing machine more frequently” (214). The most important findings from this article are that the family structure and

income level of households have the greatest influence on appliance usage. In terms of family structure, for example, Matsumoto points out that “the presence of teenagers (aged 10–19) increases the intensity of AC and dishwasher usage: a teenager eats a lot of food and prefers cooler temperatures at home” (220). In terms of economic status, Matsumoto notes that “high-income households tend to own more appliances, but use them less intensively than lower-income households” (221). This phenomenon occurs because “high-income earners tend to spend less time at home, and they consequently use less electricity” (220). Interestingly, higher income was found to be associated with a greater use in electricity for some appliances, such as ACs and TVs, but not others; such as refrigerators. This implies that the energy efficiency of refrigerators is important for people of low economic status. Matsumoto also notes that people often believe new appliances are better, because they will save energy. However, he points out that although new appliances are larger and can perform more functions, they use more electricity than old appliances. Therefore, he suggests that lawmakers raise electricity prices to reduce home electricity consumption, and encourage smarter use of home appliances.

Lyons et al. (2010) focus on home ownership of water-using appliances in Ireland. The researchers main goal is to identify the factors that determine whether a household will have a larger or smaller number of appliances. Lyons et al. find that several factors influence the number of appliances in any given household. For example, the more valuable a home is, the more appliances it tends to have. This is also true with regards to economic status, as “a doubling in income increases the odds ratio by 24%” (2864). People of higher social status and households with more people were also found to have more appliances. However, there are also several factors that decrease the likelihood of owning additional appliances. For instance, people are likely to have fewer appliances if they live in a home that was built before 1997, and if they have

been living in their home for several years (usually over a decade). Age also affects the number of home appliances. Respondents between the ages of 40 and 64 were found to have more appliances than those under 40 or over 65. The researchers conclude by noting that this statistical data can be used to help lawmakers find developments in the appliance-driven portion of domestic water demand.

Existing research on home appliances has focused on the positive and negative consequences of home technology, as well as the factors that cause people to buy an appliance. Brown notes that technology can help people stay connected to one another, but that it can also lead to unintended consequences such as issues of trust and work-family conflict. Tewathia found that having more appliances uses more energy, and can lead to a higher electric bill for families. In terms of the factors that influence consumers' appliance preferences, Abeliotis et al. discovered that an appliance's energy efficiency is most important when deciding which appliance to buy, while Kumar found that advertisements and the brand name of the appliance influence purchasing behavior. Amutha and Sulthana found that advertisements have the greatest impact on people replacing an appliance, and Matsumoto sheds light on the fact that family structure and level of household income have the greatest influence on appliance usage. Lyons et al. also note that factors such as the value of a home, economic status and age influence the number of appliances someone owns. It is important to keep these things in mind, as they can provide people with a better sense of what motivates consumers to view home appliances a certain way, and the factors that determine if someone will use a household appliance.

iii. Genetically Modified Crops

Genetically Modified Organisms (GMOs) are very hotly debated. For one thing, there is a great deal of controversy over whether GMOs are beneficial or harmful for society. There are also several different definitions of GMOs, which depend on the group being examined. Khan et al. (2012:85) provide the following explanation:

> As described by Holst-Jensen (2001) genetically modified organism (GMO) is a living organism (bacteria, plant, animal) whose genetic composition has been altered by means of gene technology. The genetic modification usually involves insertion of a piece of DNA and/or synthetic combination of several smaller pieces of DNA, into the genome of the organism to be modified. This process is called transformation. These DNA pieces are usually taken from other organisms such as bacteria or virus.

Khan et al. note that distinguished agricultural, medical and food scientists have intense fears towards GMOs, but were silenced because of political pressures from the Bush administration; who wanted to support the growing biotech industry. Khan et al. state that these groups' concerns are very legitimate, however, as genetically modified crops can lead to serious problems. For example, health issues include antibiotic threats in milk and plants. GMOs are resistant to antibiotics; these resistant qualities can easily be transferred into the environment and the human body. They are also very low in nutrients, and cows injected with the hormone rBGh were more likely to have udder infections, as well as "a rapid increase in birth defects and shorter life spans" (87). Additionally, GMOs negatively affect the environment. For example,

Monsanto's genetically-engineered trees "are non-flowering, herbicide-resistant and with leave exuding toxic chemicals to kill caterpillars and other surrounding insects – destroying the ecology of forest life" (87). It is also thought that herbicide use will triple due to genetically modified products, which would cause soil to become toxic.

Khan et al. go on to highlight the reality that GMOs can negatively impact farmers. Genetically modified seeds are very expensive (unless bought in large amounts), which can put a heavy financial strain on small farmers. The growing use of GMOs among farmers may also cause most organic foods to become inorganic within the next 50-100 years. Furthermore, numerous social, economic and political threats can emerge from the use of GMOs. Monopolization of food production is one issue, because "Although there are approximately 1500 seed companies worldwide, about two dozen control more than 50% of the commercial seed heritage of our planet" (88). Dependency is also a major concern, as "Foreign concerns can buy up all the major seed, water, land and other primary agricultural resources – converting them to exported cash rather than local survival crops", which may very well threaten the control of local economies (88-89). The researchers conclude by offering solutions to mitigate these effects, such as creating tools that can detect and quantify the risks of GMOs.

Large retail companies such as supermarkets and convenience stores are also against GMOs. In examining the reasons for this phenomenon, Russo (2015) states that "Genetically Modified Organisms are organisms that have DNA modified by the insertion of a foreign gene belonging to another living species" (93). Russo notes that most European citizens feel that genetically modified foods are unnatural, as well as harmful. The Carrefour Group conducted a survey to understand how the French felt about the presence of GMOs in food. 63% of respondents said they would not consume these products if they had known that animal feed

contains GMOs, and 27% said that they would reduce their consumption if they had known this. Furthermore, 73% of the French noted that they felt it was necessary for suppliers to indicate the presence or absence of genetically modified foods; and 23% thought that labels should probably be more accurate in this regard. The Carrefour Group then embraced a non-GMO attitude and vowed to reduce GMO products. Russo sums this up by stating that Carrefour essentially used "the marketing of fear" strategy to adjust its policies and keep its customers. In addition to audience awareness, Russo sheds light on the fact that the media also has a large influence on public perceptions of GMOs, because "The choice of words used is often intended to express a negative meaning to the concept of genetic modification associating the creation of something monstrous and unnatural" (95).

The United States Food and Drug Administration (FDA) prefers the term "genetically engineered plants", rather than GMO foods. In their article "Consumer Info About Food from Genetically Engineered Plants", they note that "genetic engineering" constitutes:

> genetic modification practices that utilize modern biotechnology. In this process, scientists make targeted changes to a plant's genetic makeup to give the plant a new desirable trait… Genetic engineering isolates the gene for the desired trait, adds it to a single plant cell in a laboratory, and generates a new plant from that cell. By narrowing the introduction to only one desired gene from the donor organism, scientists can eliminate unwanted characteristics from the donor's other genes.

The FDA notes that scientists possess several different motives for modifying plants. These include the desire to create plants with better taste, higher crop yield, and greater

resistance to damage from insects and plant diseases. Common foods with GE (genetically engineered) components include apples, papayas and squash. The FDA believes that GE foods are safe to eat, as they regulate crops with the U.S. Department of Agriculture and the Environmental Protection Agency. Regulation processes are described in their article "How FDA Regulates Food from Genetically Modified Plants". The FDA utilizes the Plant Biotechnology Consultation Program to ensure that new GE plants are safe and lawful. In this program, the FDA asks plant developers questions such as "Does food from the GE plant contain a new toxin or allergen?" and "Is food from the GE plant as nutritious as that from its traditionally bred counterpart?" The FDA works with developers to resolve any issues, and, once the GE variety is proven to be as safe as conventional varieties, the developer is reminded that they are legally obligated to guarantee that the foods they sell are safe. Information about the type of GE plant and the data and information evaluated by the FDA are then posted on the FDA's website. This process helps ensure that GE foods are safe and legal, which allows the FDA to promote a safe food supply.

Kondoh and Jussaume (2006) explore how farmers in Washington State feel about genetically modified organisms. Advocates of GMOs define GMOs as "technologies, which splice genetic material from one organism to another" (342). Kondoh and Jussaume reference Napier et al. (2004) in noting that ''rural people (farmers) are more knowledgeable of genetically engineered food and fiber products''… and may be more likely to think that the benefits of their use may outweigh on-farm risks" (345). Furthermore, "nearly half of our producer respondents expressed a willingness to try GMOs on their farming operations" (345). Kondoh and Jussaume mention how farmers who think GMOs are beneficial feel this way because a decrease in pesticide use is an enticing goal, and they believe that GMOs that come from reduced pesticide

use can promote more viable agricultural production systems. GMOs also have the potential to bring farmers more income, due to reduced pesticide use (such as with Bt cotton and Roundup-ready soybeans), or due to greater yield (such as with Bt corn). Additionally, farmers with college degrees were more likely to try GMOs than farmers with lower levels of education.

In their article "Standing up for GMOs", Alberts et al. (2013) note how anti-GMO protestors destroyed a "Golden Rice" field trial in the Philippines in August 2013. Alberts and the other scientists who wrote this article define a GMO as an organism "that is genetically modified by molecular techniques" (1320). The authors condemned these vandals' actions, as they believe that GMOs are beneficial to society. Alberts et al. note that increased testing of Golden Rice "are driven by fears of "potential" hazards, with no evidence of actual hazards", and that "GM crops have had an exemplary safety record. And precisely because they benefit farmers, the environment, and consumers, GM crops have been adopted faster than any other agricultural advance in the history of humanity" (1320). They go on to note that the GMO "Golden Rice" is more beneficial than conventional white rice, as it can provide sufficient levels of vitamin A, which prevents the blindness, illnesses and deaths among infants and women that often result from vitamin A deficiency. Alberts et al. believe that GMOs should be viewed positively, as they "have the potential to save millions of impoverished fellow humans from needless suffering and death" (1320).

GMOs are like smartphones and household appliances in that they have become increasingly subject to human influence in recent decades. However, unlike smartphones and home appliances, there is no clear-cut, widely accepted definition of what a GMO is, as the definition depends on the group being asked. There are legitimate fears associated with GMOs. For instance, Khan et al. note that genetically modified plants can destroy the environment

around them, and transfer their antibiotic-resistant qualities to humans. Kahn et al. also state that GMOs cause issues of monopolization of food production and foreign dependency for farmers, and Russo notes that large retail companies such as supermarkets are against GMOs because their customers feel that they are unnatural and harmful. Russo also states that companies often market "the fear of GMOs" to keep their customers, and highlights the reality that the media has a significant influence on shaping attitudes towards GMOs. The FDA goes through several steps to ensure that GMOs are safe, however, some people are still not convinced that GMOs are safe to consume. Kondoh and Jussaume and Alberts et al. note that GMOs can be beneficial, as they can potentially bring farmers more income than regular crops, and provide greater levels of nutrients to help save impoverished humans. GMOs are a very complex issue, and more research is needed to help people better understand their benefits and drawbacks, and help GMOs become more widely accepted in the public sphere.

iv. Technologies in Other Areas of Life

Numerous other technologies and their perceived risks can also greatly influence society. In their book *Perceptions of Technological Risks and Benefits*, Gould et al. (1988) attempt to discover people's attitudes towards the risks and benefits of various technologies, and their thoughts on proper levels of technological regulations. Respondents in Arizona and Connecticut were asked questions about technologies such as handguns, automobile travel, air travel and

industrial chemicals. The researchers concluded that respondents felt “current safety regulations for each of these technologies are less stringent than they should be”, which implies that “existing technology safety regulations *do not* represent acceptable trade-offs between the risks and benefits of technology in this country” (131). Interestingly, the researchers note that, in general, perceived risk factors (such as the technology’s potential for disaster and death) had a greater likelihood of influencing participants’ views towards technologies and safety regulations than the benefits of technologies. However, “such individual elements as economic benefits, contribution to basic needs, contribution to people’s pleasure, and contribution to people’s safety and security played an additional role in many of their acceptability judgements” which shows that people also recognize the benefits of technologies, and, thus, may be more likely to use them (135).

Tseng et al. (2013) provide insight into college students’ attitudes towards science, technology, mathematics and engineering in a project-based learning environment. Tseng et al. studied 30 freshmen with engineering experience at five institutes of technology in Taiwan. They note that students initially felt that “technology is beneficial and important to society, medical treatment, and living” (90). However, some students also expressed negative views on technology in their interviews. This may be due to students’ beliefs that technology can make the world more convenient, combined with their attitude that “technology is somehow harmful to human life, health and environment, such as the hacker intrusion and the effect of electromagnetic waves on the human body”. Such consequences may cause ‘‘the loss of social harmony and nuclear war’’ (94). Students suggested that technological methods for environmental protection should be developed, to mitigate the negative effects of technology within society and the environment.

Along these same lines, Webster (2016) used a qualitative study to understand the technological views of K-12 technology leaders. Enthusiasm for technology was very widespread among participants. Webster notes that a technology director expressed technological enthusiasm when stating, “A favorite saying of mine is that whatever the ill might be, technology will save the world!” Interestingly, Webster also found that several technology directors embraced the view “keep up with technology (or be left behind)”, as they believe that technology can help education, and therefore make everyone happier. Nevertheless, Webster notes that most participants also believed that “technology raises questions of human values, either through promoting certain values, or because the employment of technology has ethical consequences, whether intended or unintended.”

Parker et al. (2008) investigate the factors that influence students’ and faculty’s views on WebCT and PowerPoint technology at a large, public college. For example, students and long-term faculty viewed PowerPoint positively, as they saw it as a way to remember key ideas. Part-time faculty, however, “were more likely to relate technology use with negative outcomes such as reduced attendance and reduced learning” (290). Overall, results indicate that gender and organizational tenure greatly influence how students and faculty perceive instructional technology. Factors such as grade point average and class/faculty rank also affect technological perceptions. Parker et al. note that, when used properly, technology can have numerous benefits for students: “When technology is used in transformative ways, for example as a means to facilitate problem-based, collaborative learning or as a means to simulate field experience, it can help students achieve ends not possible through traditional classroom mediums” (291). In order for technology to aid education, Parker et al. note that colleges must make smart choices, such as using relevant programs, and providing support for users.

Similarly, Baker and Carreno (2015) have examined how technology affects adolescent dating and dating violence. Data was taken from 39 high school students who had experienced relationship issues in the previous year. Baker and Carreno note that the participants viewed technology as important to establish relationships, and to update their relationship status on social networking sites. However, this can also be problematic: “in some cases one partner was not as forthcoming as the other, and in fact, would hide his/her relationship status, thereby causing the other partner to become jealous” (313). Participants also noted that once people posted that they were in a relationship, their friends and peers would often try and “screw it up”. Additionally, several participants mentioned that they were victims of “monitoring”, where their partner would check their texts and social media messages to see who they were talking to. Baker and Carreno note that “these actions were typically rooted in jealousy” (314). Partner-imposed isolation also stems from technology use, as “boys would monitor their partner’s activities and then would take it a step farther and try to make sure that no other boys had technology (and other) access to their girlfriends” (315). Baker and Carreno recommend that students be made aware of options for support, and that they set limits on how and when they should contact their partner, as this will help decrease the negative effects of using technology in relationships.

Cyr et al. (2015) examine how technology use and preference for communication technology affect social relationships, identity development, and psychological adaptation. Cyr et al. studied high school students in Central Florida, and found that students who used communication technology more frequently had higher levels of identity distress and external anxiety. Additionally, use of communication devices “seem to be related to a decrease in the quality of peer relationships”, and difficulties managing relationships may increase technology

use; as people may want to distance themselves socially from others (89). Technology use was also found to cause psychological problems such as anxiety, depression and somatization. Cyr et al. conclude by stating that increased awareness of how technology affects identity and relationship development can be used to create and improve programs that promote positive advancement among youth.

Fitton et al. (2013) interviewed how thirteen and fourteen-year old students perceive technology. The responses were highly positive, as students thought technology was essential to all areas of their daily life. Students mentioned that they liked how they could use technology to talk to others, stay connected to friends, and meet new people. Fitton et al. go on to note that "These adolescents understood the necessity of using technology for the development of their cognitive/academic skills. They perceived personal IT skills as advanced and spoke about the need to have those technology skills for their future academic and career goals" (408). Interviewing students is useful, as it can improve understanding of youth development, and provide suggestions for further research on technology.

Hasselbring and Glaser (2000) explore the benefits of computer technology for students with special needs. For example, optical character recognition technology (OCR) can scan and read text aloud, which gives the visually impaired more access to print materials and the ability to "read" materials on their own. Also, "Technology facilitates the students' ability to make personal connections with others and provides opportunities to focus on writing skills within a context that they value, without fear of being stigmatized" (108). Ultimately, Hasselbring and Glaser note that technology can level the playing field "by freeing many students from their disability in a way that allows them to achieve their true potential" (118-19). Hasselbring and

Glaser conclude by suggesting that educators and policy makers familiarize themselves with educational technologies to ensure that all students have an opportunity to learn.

Lastly, Jobling (2014) discusses the numerous benefits that technology can have for the elderly. For instance, “Technology can reduce isolation and improve safety for people with hearing or vision loss, physical disabilities, and failing health” (49). Also, several seniors who acquired technology skills now feel more mentally aware and confident. Furthermore, “When elders get the chance to see how technology can connect them with friends, family, and activities—plus receive tailored trainings and regular computer access—they embrace technology wholeheartedly and it becomes a powerful tool for facilitating relationships” (50). Jobling believes that all older adults deserve the opportunity to establish social connections via technology, as it can improve health and happiness as people get older.

In conclusion, people often have mixed views about technology. Gould et al. found that perceived technological risks generally have a greater influence on people’s attitudes toward technology than technological benefits, although elements such as economic benefits may make people more inclined to use technology. Tseng et al. discovered that college students feel technology can be both beneficial and harmful for society. These sentiments were also echoed in Webster’s research on K-12 technology leaders, who noted that while technology can improve education, it also has the potential to cause ethical problems. Furthermore, Parker et al. found that college students and faculty have mixed views on technology, and that factors such as gender and class/faculty rank greatly influence technological attitudes. Baker and Carreno and Cyr et al. found that technology use can negatively affect relationships, as it can lead to partner-imposed isolation in adolescent dating and a desire to distance oneself socially from others; as well as psychological issues, such as depression. However, technology also has many benefits.

The overwhelming number of adolescents in Fitton et al.'s study viewed technology positively, as they realized that technology is essential for developing academic skills and meeting new people. Hasselbring and Glaser note that computer technology can help students with special needs make connections with others and achieve their full potential without being stigmatized, while Jobling notes that technology use can reduce feelings of isolation among the elderly, and allow them to establish social connections. Overall, technology is a very important aspect of society today, and must be understood from all angles if we are to improve how people view and use it in the future.

II. IMPLICATIONS FOR THIS STUDY

Existing literature on technology has provided substantial insight into the benefits and drawbacks of technology in society, and offers suggestions as to how to improve both technology itself and people's attitudes towards technology. The data illustrates that people's personal experiences with technology and the influence of peers are the main factors that affect people's technological attitudes. In turn, these perceptions are often the most important thing which affects whether someone will use technology. Since these trends hold true for the wider population, we can reasonably expect these tendencies to remain constant for college students as well. This study will investigate this pattern in greater detail, focusing on how college students' technological views (which stem from personal experiences) affect whether they use technology, and the ways in which they use it. The technologies being examined are those relevant to college students, such as smart phones, personal computers and iPads/tablets. This study will provide people with an enhanced understanding of the psychological side of technology, which will enrich our understanding of the complex role that technology plays in society today, and,

ultimately, enable us to make more cognizant choices about how to use technology responsibly moving forward.

CHAPTER TWO: METHODS

INTRODUCTION

This study investigated how American college students use digital technology (smart phones, laptops, social media, texting, etc.) and how they feel about this technology. I chose digital technology as the focus of this study, as I feel that digital technology is the type of technology that is most commonly used among the younger generation. I also thought that this is the area of technology that students are most knowledgeable about, and that a survey on digital technology would yield the greatest number of responses. Home appliances and GMOs were not included due to student's perceived lack of familiarity and interest in these technologies. Students were asked how they use technology in different situations, and whether they have had mostly positive or negative experiences using technology. Do personal experiences truly influence technological attitudes, and whether someone will use a certain technology? Examining college student's relationships with technology will provide greater insight into how and why the younger generation uses technology.

An online survey was made using Google Forms. Participants were provided an informed consent page prior to completing the survey. The Human Subjects Research Review Committee approved the survey as well as the consent form, which can be found in the attached appendix. The online survey was sent to a random sample of 502 students, which was provided by the Office of the Registrar. Students were e-mailed an invitation to answer the survey, along with a link to the survey page. Participation in the survey was voluntary and anonymous, and student's e-mail addresses were not recorded or connected to survey responses via the Google Form.

Google Forms compiled the anonymous data into an Excel spreadsheet in Google Drive. Questions for gender were chosen on the basis that the questions would yield at least some variation in how men and women use and perceive technology. We then ran cross-tabulations for these questions in SPSS to determine the extent to which gender affects technological use and attitudes.

I. Informed Consent

On the first page of the survey, students were asked to click continue only if they agreed to the informed consent section. Participants were told that the survey would take approximately 10 minutes to complete and would be anonymous, so that their names would not be linked to their responses. Students were informed of the types of questions that would be asked, and were told that they did not have to answer any question they did not want to, for any reason. The form also stated that they would be allowed to withdraw from the survey at any time.

II. Research Questions and Analysis

The purpose of this survey was to gain insight into how college students use technology and how they feel about it, and to learn the things that lead them to use or not use a specific type of technology. The technologies examined included smart phones, personal computers, iPads/tablets, and methods of communication such as e-mail and text messaging. The first part of the questionnaire asked about demographics: gender, class year and age. Students were then asked to answer the age at which they began using different devices, and how often they spend using these devices each day.

The next section asked questions about technological perceptions. Participants were asked to clarify their views on issues such as why they choose to use or not use technology in

different situations, and explain their answers to questions regarding how technology has affected them.

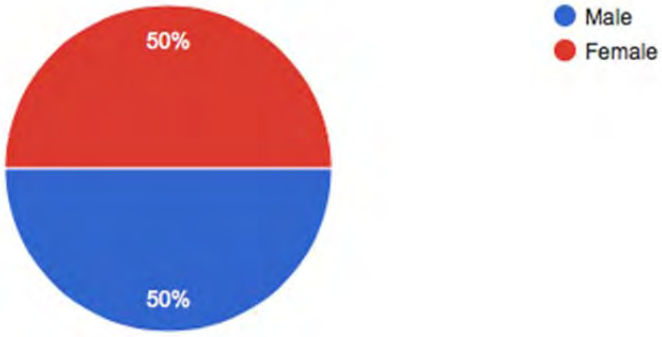
Following the questions about technological perceptions, people were asked to describe their experiences with technology (have their experiences been mostly positive or negative, and have these experiences altered their views so that they began using or stopped using certain devices).

Google forms organized the anonymous data and presented it in the form of pie charts and short responses. I made sense of the data by going through the responses and grouping them into similar categories, so that it would be easy to begin analyzing and drawing conclusions from the responses.

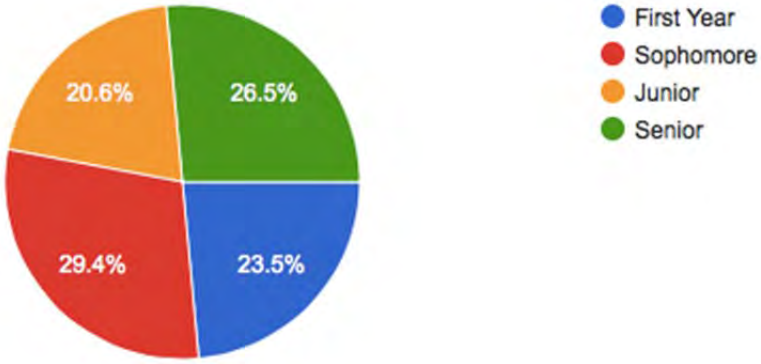
III. Sample Characteristics

Of the 502 students who were asked to participate, 68 answered the survey, and 67 of those who received the survey agreed to partake in this study. There was a 13.5% response rate. Fifty percent of participants were female and fifty percent of participants were male. Most respondents were either in their sophomore or senior year. Most people in the sample were between the ages of 18 and 22, although some were under 18, and some were over 22. The distributions for gender, class year and age can be seen in the following pie charts.

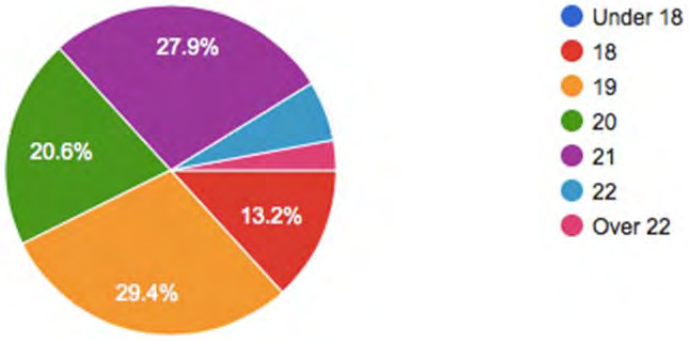
Are you male or female? (68 responses)



What is your current grade? (68 responses)



How old are you? (68 responses)

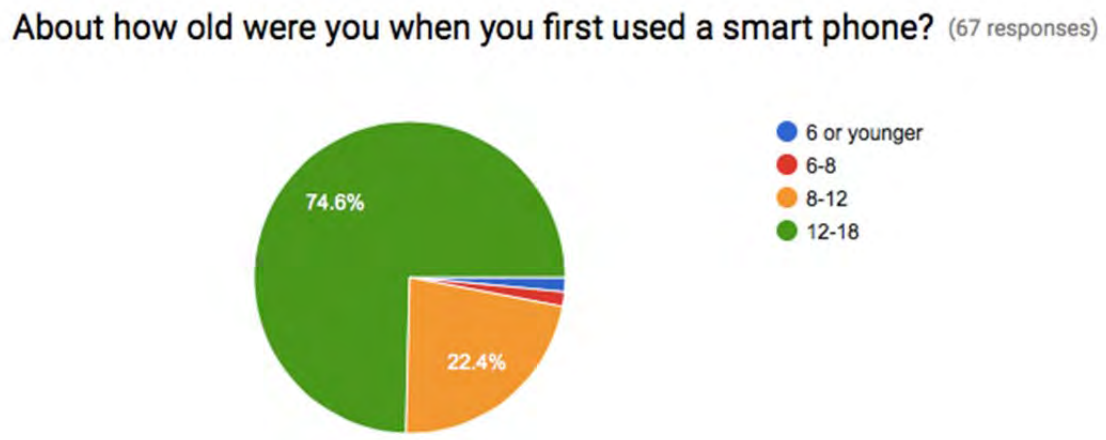


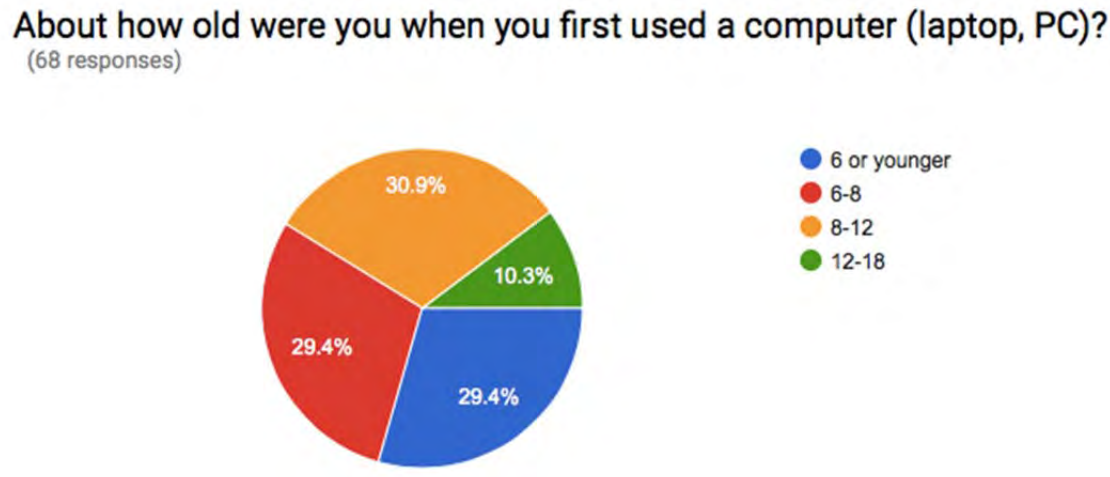
CHAPTER THREE: RESULTS

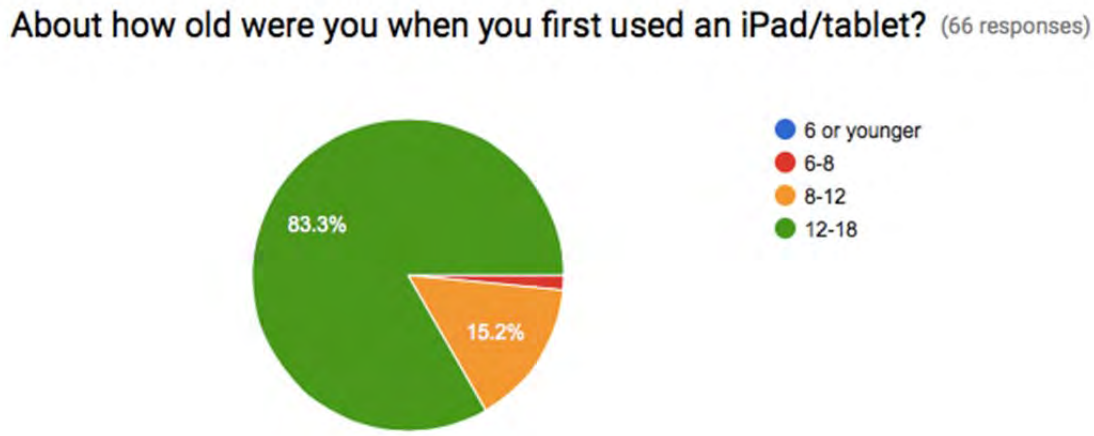
I. TECHNOLOGICAL PERCEPTIONS

i. Age at which respondents began using certain technologies

Respondents were asked the age at which they first used certain technologies, specifically smart phones, computers (laptop or PC), and iPads/tablets. The results can be seen in the pie charts below.



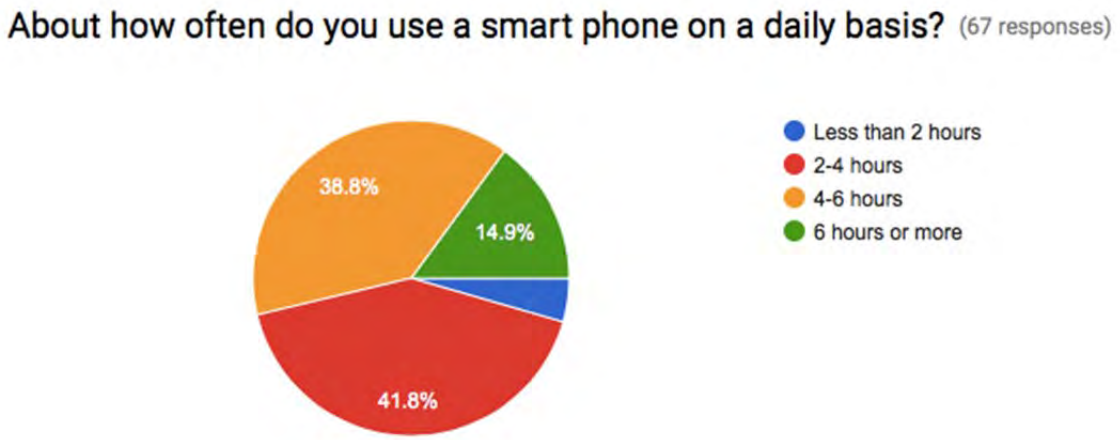


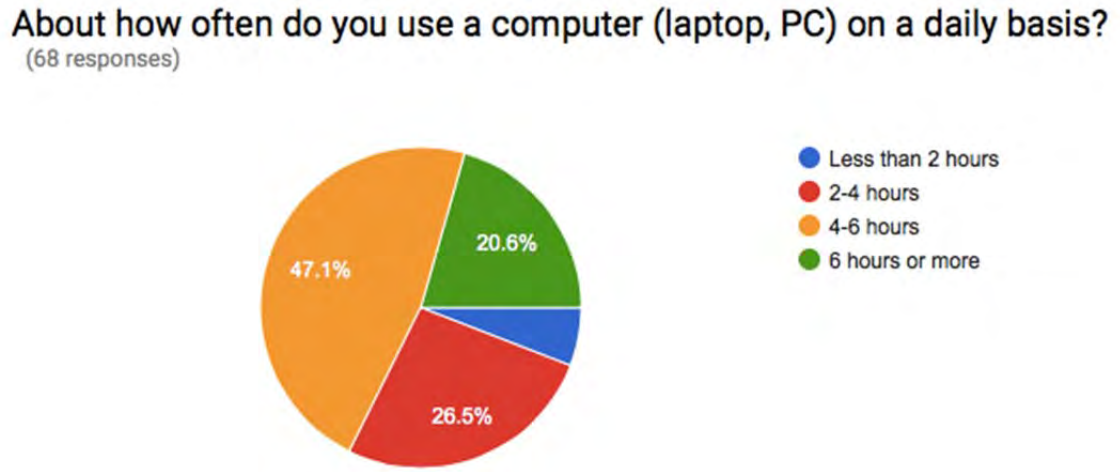


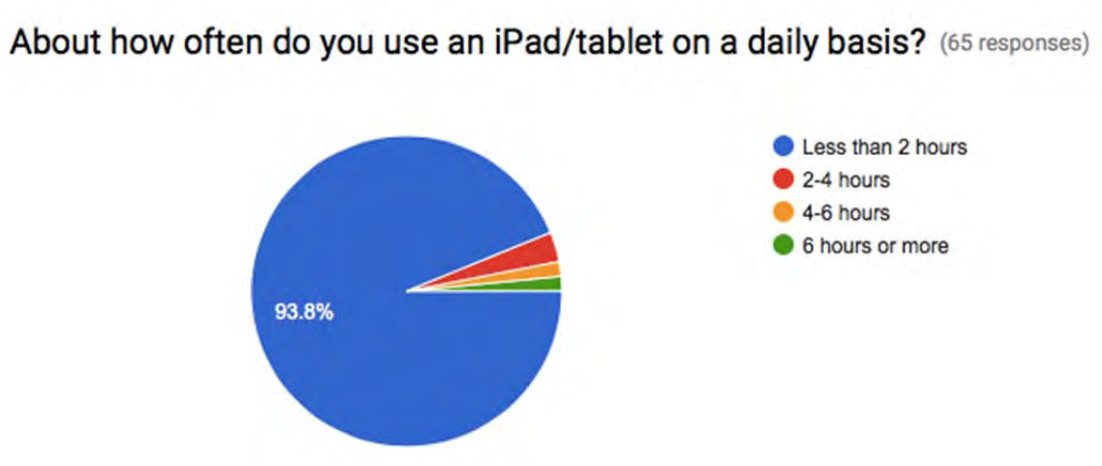
Although not all those who responded to the survey answered these questions, virtually everyone did, so there are enough responses to draw conclusions. We can see from these charts that students started using computers at a younger age than either smart phones or iPads/tablets. This suggests that people think computers are a good technology to start with, as using a computer can help one develop basic technological skills. This phenomenon could also be attributed to the fact that it is easier to use handheld devices if one is already familiar with how to use a computer, as smart phones and tablets can perform many of the same functions as a computer. Young children can also use a family computer or a school computer; if they use a smart phone, it is probably their own. This might explain why most participants started with computers before using smart phones. Timing could also explain this. Computers came much earlier than either iPhones or iPads, which were not introduced until the late 2000s, when these kids were only 6-7 years old.

ii. Amount of time spent using technologies

Students were then asked to state the approximate amount of time they spend using each of these technologies on any given day. The results are seen in the pie charts below.







Most respondents said they use smart phones for 2-4 hours a day, computers (laptops or PCs) for 4-6 hours a day, and iPads/tablets for less than 2 hours a day. The data proposes that a fair number of people use their smart phones and computers for more than six hours a day. Only 4.5% of students said they use a smart phone for less than 2 hours a day and only 5.9% said they use a computer for less than 2 hours a day, compared to 93.8% who said they use iPads/tablets for less than 2 hours a day. Clearly, smart phones and laptops are more popular among college students than either iPads or tablets. This could be because students feel that smart phones and computers are more useful in college, or because they simply do not feel the need to have an iPad or tablet, as smart phones and computers can perform essentially the same functions and fulfill the same purpose.

When we examine the types of technology that students use the most, it is important to consider the fact that the current generation of college students has grown up in a rapidly changing world of technology. Smartphones and laptops, and the capabilities of these devices, have completely changed within the past two decades. For example, the MacBook Air, which was released in 2008 (two years after the MacBook Pro), is much lighter and sleeker than its

predecessor. Technology options have been growing at the same rate as today's students have been growing up. It is only recently that parents have started giving smartphones to their young kids (usually with software protections carefully installed). Five years from now, however, we might expect this data to be different. Perhaps more people would report using smartphones and tablets from a young age. Technology is always evolving, and it is important to remember that these findings may not hold true in the future.

iii. Importance

In terms of technological importance, 76.5% of respondents said that technology (smart phones, laptops, television, etc.) is of greater importance to them in college than before they came to college. 23.5% believed technology is of the same importance to them, and zero percent said that technology is of less importance to them. Several factors account for the high rate of technological importance among college students.

Communication was a major reason why people feel that technology is of greater importance to them in college than it was prior to college. As one student put it, “Everything from social to academic life is connected heavily through this technology.” Technology was described as making communication easier to keep in touch with family, friends, professors and fellow students. Several respondents also mentioned that specific methods of communication, such as text messaging, emails, GroupMe, Facebook, WebAdvising and Nexus, were important to stay connected to classes, clubs and events.

The ability to stay up-to-date with academic and social affairs were also prevailing reasons as to why people feel that technology is of greater significance to them in college than it was previously. Almost everyone noted that they use technology for academic reasons, such as

communicating with professors, doing assignments (homework, research, papers, projects, etc.) and registering for classes. Technology was also viewed as being more academically important in college than in high school, as most assignments in college are typed, and most staff communicate through technology. One student noted that “You could not complete even a day of college without technology.” Technology helps students keep up with academic and extracurricular involvements, as well as the campus in general. One person observed that, without technology, they would feel isolated from classes, events and the campus community in general.

Convenience was yet another factor that people noted as to why technology is important. Those in this cateogry believe that “It allows for more convenient completion of coursework and working from the dorm”, and that it is easier and quicker to take notes on a computer than to write things down. Another person wrote that technology is the most accessible and effective way to study, research and communicate with others. Having access to technology was also believed to be beneficial, as many assignments are due online. Furthermore, people remarked that they liked the ability to have constant access to knowledge (because it helps them take care of themselves), and the ability to communicate and store information.

There were also other factors that do not align with those previously mentioned. Some people felt that technology allows them to be organized and partake in leisure activities. Respondents feel that they are busier in college, so they use their smartphones to keep track of things, manage their schedule and organize a greater part of their day. Participants said that they used technology to engage leisure activities such as entertainment, watching shows and online shopping, and noted that more and more everyday tasks are done using online programs. The freedom to use technology without being constrained by parents or high school rules was also

discussed, as well as the “keep up with technology or be left behind” attitude that one is expected to adhere to in the real world.

Since only 23.5% of respondents reported technology as being of the same importance to them in college as it was prior to college, it is more difficult to make sense of those who thought that technology is of the same significance to them in college. However, we can still analyze those who did provide insight into why they feel this way. One student noted how they went to a tech savvy high school and are used to using technology in their daily life, while another observed that high school tasks require the use of technology to the same degree as college tasks. Others simply said that they use devices such as a phone and computer the same in high school as in college.

Interestingly, although nobody believed technology is less important to them in college than it was prior to college, some answers do shed light on the fact that certain purposes of technology are not as important in college. For example, one respondent wrote that social events are mostly addressed via e-mail outside of college, which implies that e-mail is not the preferred method of communicating social events among college students. Another participant said that they use technology more often for school, but less for social reasons. Technology is often seen as important for communicating and being social with peers. However, these responses indicate that not all college students feel this way, and highlight the reality that people may have different priorities.

iv. Ease of use

Everybody agreed that technology has made it easier for them to access information. This is not surprising, considering students’ reasons for technological importance discussed in the previous section.

v. Communication preferences

54.4% of students said that they think it is easier to communicate with others via technology, compared to 45.6% who prefer face-to-face encounters. Those who would rather use technology think it is more convenient, as they are often busy and don't have time to meet with someone. Respondents also noted technology is easier to use, as it provides the ability to relay important information in a timely manner and reach more people faster, as well as people who aren't present or who may be far away. Some people also noted that they like technology better because it is less personal and awkward, and gives them more time to think through answers before responding. Others get nervous talking face-to-face, and feel that they come across better in writing, although they may follow-up in-person after sending an initial e-mail or text.

Students who reported that they would rather communicate in-person said so because they feel this it is more personalized. They also explained that talking was clearer because it allows you to pick up on social and nonverbal social cues such as body language, emotions, tone and reactions, and ultimately leads to fewer misunderstandings; as secondary meanings are often lost through technology. People also noted that information such as complex ideas can be conveyed quicker and more effectively in-person than via technology, and that face-to-face communication is more genuine because you can see the other person's reactions. Other respondents prefer this method because it is easier to come up with a solution in-person than through e-mail or texting. A few people also gave mixed answers, saying that they feel it is easier to talk via technology, but that you get more correct answers in-person.

Students were then presented with two different scenarios in which they had to describe how they would communicate with someone. The first situation asked whether someone would prefer to schedule a meeting with their professor via e-mail or in person. 73.5% of respondents

said that they would prefer to schedule via e-mail, compared to 26.5% who would do schedule in-person.

We find that those who prefer to schedule a meeting via e-mail do so because they think it is faster, and do not have to wait until class or spend time tracking down a professor. Respondents also noted that e-mail allows for a written record of the meeting time, which they can look back at for details. E-mails make it easy for people to remember the meeting, add it to their calendar, and follow through on it. Students also noted that they are busy and don't want to interrupt the professor. We also find that e-mails allow participants more time to think about what they say, and look at their schedule to plan accordingly. Interestingly, some remarked that they use e-mail because professors prefer to schedule meetings this way and because e-mail has become the societal norm, which suggests that they only use e-mail because they should, not because they want to. One person mentioned that they prefer in-person scheduling, but that they use e-mail because professors tend to relay more via e-mail.

Those who would rather schedule the meeting in-person prefer to do so because they like talking face-to-face, and feel it is easier to communicate problems. It was also pointed out that it is easier to agree on a time in person, and there is more of a connection in-person. Furthermore, some respondents said that scheduling can be more efficient in-person, as they can have a full conversation and get an answer quicker rather than waiting for a response via e-mail. One student also mentioned they prefer to talk because they are good at writing, and another believed they are more likely to remember to schedule the meeting when they see the professor, as they would probably forget afterwards.

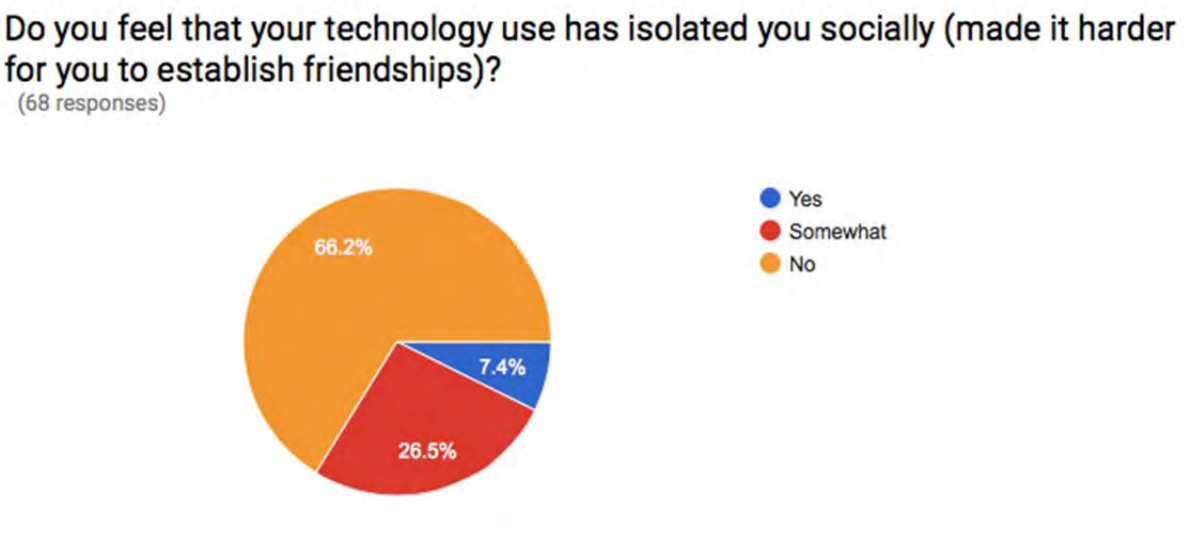
In the second scenario, people were asked how they would plan a time to go to the movies with friends. 60.3% said they would rather do this via technology (text, calling, etc.),

while 39.7% would prefer to do this in-person. Those who would use technology to schedule this meeting reported they would do so because it is more convenient, as technology can reach a large group of people very quickly, and doesn't require people to take time out of their busy day to physically meet. Texting was often described as beneficial because it provides people with a written record that they can refer to for details, allows people to see their peers' opinions, and can keep people up-to-date if plans change. To a certain extent, friends were also viewed as more communicative over texts.

We can conclude that those who would prefer to schedule this outing in-person prefer this route because it is more genuine and easier to agree on a time in a physical meeting, as everyone is on the same page, everyone present can offer their opinion, and there is no waiting for a response. Spontaneity was also emphasized as an advantage of this method. Although some students would usually prefer to use technology in this situation, they did offer that they would prefer to plan this in-person if the entire group was present, and if it were convenient to talk face-to-face.

vi. Consequences

85.3% of students believes that technology can have unintended consequences, which implies that most people are aware mindful enough to realize that technology is flawed. Respondents were then asked whether technology has caused them to feel socially isolated. The data is presented in the following pie chart.



If one said “Yes” or “Somewhat”, they were asked to explain their feelings. Responses vary greatly. Some people think that technology has resulted in less personal contact and fewer human interactions, as it creates a sense of disconnection that often makes it hard to establish close friendships. Others highlight that the convenience of technology provides a certain degree of comfort that allows people to be comfortably isolated, which discourages them from stepping outside their comfort zone to make new friends, and makes conversation disingenuous. A large portion of the sample also noted that the reliance on phones and texting has made it harder for people to talk face-to-face, and has caused them to miss out on meeting new people, having spontaneous conversations, and even spending time with family. Only one student explained their view of “somewhat”, stating that, to a degree, social media has enabled people to be content with technology-mediated social interaction in the absence of real interaction.

When faced with the question of whether someone would feel insecure without technology, (i.e., not having their smart phone at all times) 41.2% of respondents said “No”, compared with 58.8% who said “Yes”. Those who answered “Yes” were asked to clarify this view. Students who replied “Yes” believed they would often feel left out without a smart phone,

as someone may be trying to contact them. Several participants also mentioned how a lack of access to information makes them feel insecure, while others noted that they would feel insecure without a smart phone because “it’s a crutch”: it serves as a “safety blanket” or “buffer” and a sense of comfort for them in difficult situations. Many people also remarked that they rely on their smart phone for virtually everything, and one even went so far as to say it has become part of their identity. Without a smart phone, insecurity would manifest itself in feelings of danger and vulnerability, silence, disorganization, and not having a lifeline. One respondent wrote that they would not feel “insecure”, but rather “less able to react to unexpected events” without the ability to access the functions of a smart phone. Some students also stated that they only realized how much they relied on their smart phone when they did not have access to it.

vii. Views

Concerning technological views, participants were asked to describe the most important thing that would lead them to view a certain technology positively or negatively. Answers were mixed for both positive and negative views. Respondents noted that they would view a certain technology positively if it is effective, quick and easy to use, and if it makes life easier. The benefits of technology (such as keeping in touch with others, access to information and useful features), if it is helpful and has a good impact on society also lead students to view technology positively. Technology would also be viewed emphatically if it enhances one’s quality of life and relationships, if it used for the right reasons, and if it does not further isolate someone. Brand, price, security and the “ability to expand your world” were also discussed as factors that could affect technological views.

On the negative side, many students observed that people are too overly reliant on technology. One respondent said that nearly everyone on campus is always looking at their phone in the dining hall and when walking around. Others noted that being attached to things like Netflix can inhibit and degrade the quality of relationships and interpersonal interactions, and can lead to social isolation. Social media platforms such as Facebook and Snapchat were also perceived as distracting, and making things more complicated than they need to be. Respondents also highlighted the fact that many people worry about how they are viewed on social media, and that people are often more comfortable with themselves on social media than in reality. Along these same lines, technology was also described as causing a loss of social confidence and only allowing one to see certain views, which prevents people from taking risks.

Along these same lines, people also said they would view technology negatively if it was difficult to use, and the lack of critical thinking required to use a technology properly and not be consumed by it would also prevent people from thinking highly of it. People also do not like the predictable nature of technology. It is worth noting that some students could not commit to either side due to mixed feelings, which suggests that people should 'proceed with caution' when using new technologies. One person also said that humans are capable of both love and hate, so technology could help or hurt someone depending on who is using it, and their intentions.

viii. Use

The final question in this section dealt with the most important thing that would cause one to use a specific type of technology. Respondents cited convenience, user-friendliness, effectiveness, the ability to communicate and the extent of necessity as major reasons why they would use a certain device. The ability to access things such as information and the Internet and

capabilities/what the technology offers were also brought up as important factors in this decision. Furthermore, size, speed, simplicity, functionality and the ability to keep in touch with others and perform work lead people to use technology. We also learn that, in some cases, students were more inclined to begin using a technology if they saw friends using it. Security, ability for organization, brand name, dependability and if the user has a good experience were also pointed out as reasons why one would use a certain device. Furthermore, respondents observed how they use different technologies for different tasks (such as a phone for texting and calling and a computer for typing), and that most modern technologies can emulate one another, such as how a phone can act as a computer and vice versa.

ix. Gender

Current literature on technological perceptions does not take gender into account when examining one's perceptions about technology. We will attempt to begin to fill this gap by investigating whether men use technology more often than women, whether men and women use technology differently, and whether men or women experience more negative feelings because of using technology. The questions chosen for this analysis focused on how much time students spend using specific devices, whether they think it is easier to communicate via technology or face-to-face, and whether their technology use has caused social isolation and self-doubt.

In the data set, there are 68 cases, which consist of 34 males and 34 females. Nine cases are missing, as not everyone answered each question. Despite these missing cases, there is enough data from which we can draw tentative conclusions. When we examine the effect of sex on technological views and use, we find that there are few differences between how men and women perceive and use technology. Since we have the exact same number of males as females,

and since percentage differences among men and women are very small, we can safely arrive at this verdict. However, there are some exceptions to this data, which will be discussed where applicable.

When asked to report their daily smart phone use, 50% of men said they use a smart phone for 2-4 hours per day, while almost half of women (42.4%) claimed that they use a smart phone for 4-6 hours a day. This anomaly could be because women may use more apps than their male counterparts, or because they use a smart phone's functions to a greater degree than men. However, since the "2-4 hours" and "4-6 hours" categories received the most responses, we can determine that most men and women use a smart phone anywhere from 4-6 hours on any given day.

In describing their daily computer use, most participants stated that they spend about 4-6 hours a day using a computer. The "4-6 hours" a day category had the highest number of responses, with a total of 47.1% (38.2% for males and 55.9% for females). This was followed by totals of 26.5% of respondents who said they use a computer 2-4 hours a day, 20.6% who work on a computer for 6 hours or more, and only 5.9% who use a computer for less than 2 hours per day. We can infer that daily computer use for most men and women is at least 2 hours a day, since computers are an integral part of success in college.

The next question concerned how much time one would be on an iPad for. 93.9% of men and 93.8% of women said that they spend less than 2 hours a day using an iPad. Interestingly, no females reported using an iPad for 4 hours or more, while only 2 males use an iPad for at least 4 hours daily. This implies that men may prefer iPads more than women. The iPad's lack of use among both genders suggests that it is not popular with today's youth. This is most likely a result

of the fact that many people feel they do not need an iPad, since devices such as smart phones and computers can complete many of the same tasks as an iPad.

Most people believe that communication is easier in-person than it is through technology. 52.9% of men feel this way, compared to 55.9% of women. These results are in line with respondent's answers such as how face-to-face meetings are more genuine, personal and provide clearer responses than methods such as texting or e-mailing.

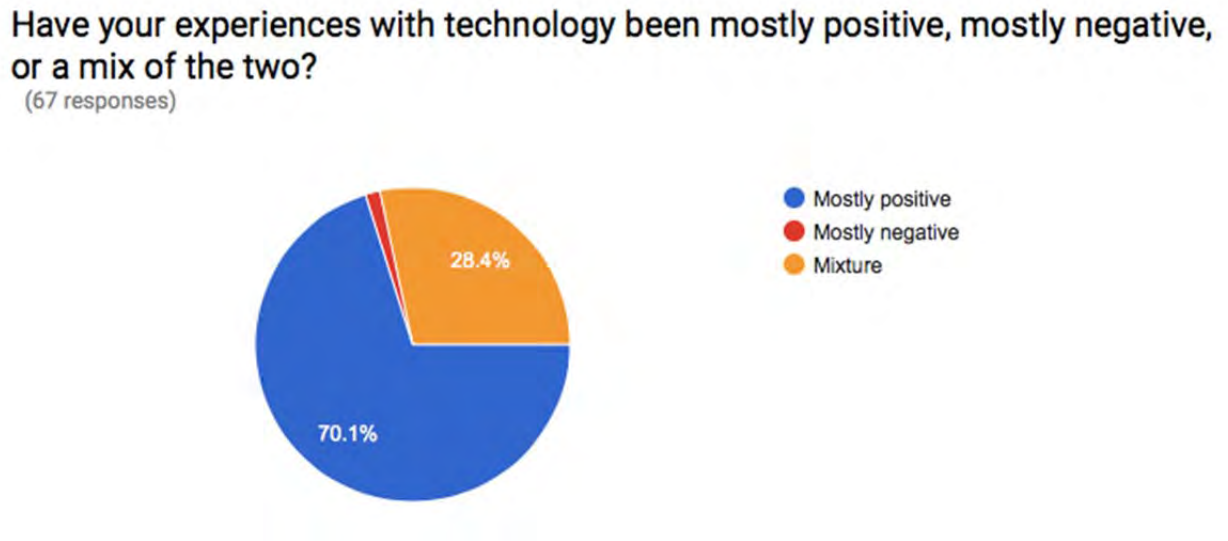
66.2% of students thought that technology has not caused them any kind of isolation whatsoever. 58.8% of men and 73.5% of women answered "no" to this question. We can assume that those who replied "no" did so because technology has helped connect them to friends and family that they may be otherwise be unable to get in touch with.

Lastly, 58.8% of respondents were found to feel insecure without access to technology. 61.8% of males answered "yes" to this question, while 55.9% of females said "yes". Students' feel unsafe, "naked" and anxious without technology because they feel that they are missing out on being social, an important call or text message, and access to information and contacts which they may need in an emergency.

II. PERSONAL EXPERIENCES WITH TECHNOLOGY

i. Types of Experiences

When it came time to ask about the types of experiences they students had when using technology, most responded by saying their experiences have been "mostly positive". The results are shown in the pie chart below.



ii. Best Experiences

Participants were then asked, “What has been your best experience with technology?”. Most respondents said that technologies such as Facebook, Skype and WhatsApp have easily allowed them to stay in touch with friends and family in a way they may be unable to do otherwise. For instance, one student noted how FaceTime has helped her communicate with her sister who lives in China, and others remarked that WhatsApp and email helped them keep in touch with family during their term abroad. Others mentioned that technology has helped them keep re-connect with old friends. We also find that several respondents cite instant access to information about anything as their best experience with technology, and that some believed it has helped them organize their schedule and make plans with people whose phone numbers they may not have. Still others stated that technology has allowed them to do research for school, and a few said technology has helped them keep up with world news. Others said that they like

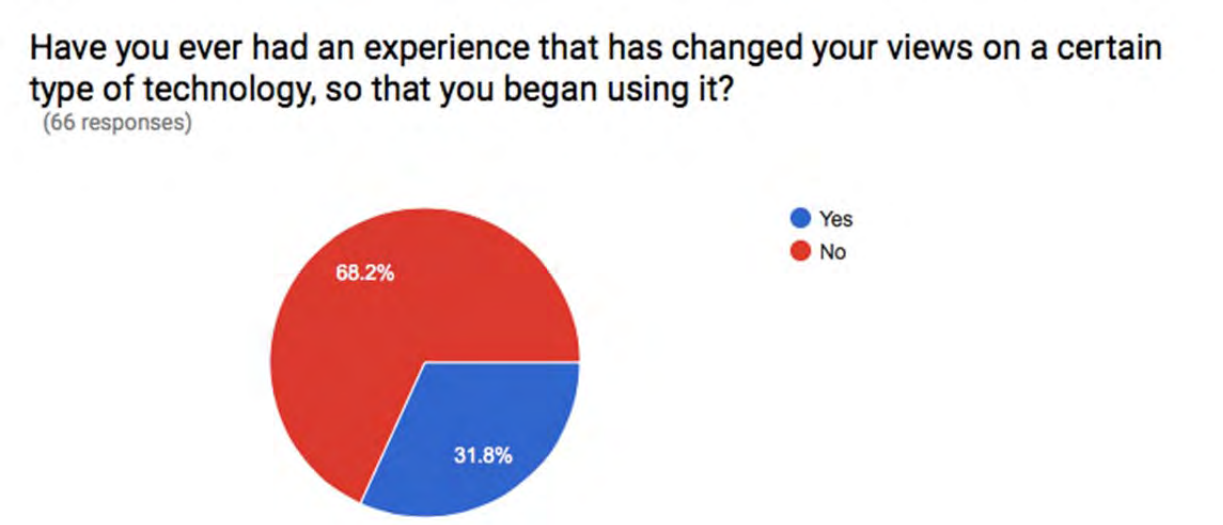
technology simply because of the amount of possibilities it provides, and some explained how technology can be very useful in emergency situations, such as being stranded or lost.

iii. Worst Experiences

The next question asked students "What has been your worst experience with technology?" The data shows that most respondents mention technology shutting down, malfunctioning, and/or breaking (Internet restarting, laptop freezing during an exam, loss of information, bad Wi-Fi, etc.) when doing schoolwork, communicating with others or trying to access information as their worst experience with technology. Interestingly, some people noted that they did not know what to do with their time when they lost their phone or when they lost power, which suggests that some students rely on technology for too much. Unreliability (due to products not working "as advertised"), hacking and having to get devices fixed were also listed, as well as teaching others and oneself how to use new technology. People also pointed out that technology has caused social issues, as it has detracted from personal interaction and caused tensions among friends due to miscommunication, misinterpretation and texting rather than talking in-person. Cyber bullying and online harassment also fall into this category, and one person even said that they have noticed "how racist people can get when they do not have to show their face". We also determined that some respondents believe that technology can be distracting, as a lot is going on in one place, and because it is time-consuming and can potentially become addictive.

iv. Experiences that have caused someone to start using a certain technology

Answers to the question of whether someone has had an experience that has changed their views on a certain technology so that they started to use it can be seen in the following pie chart.

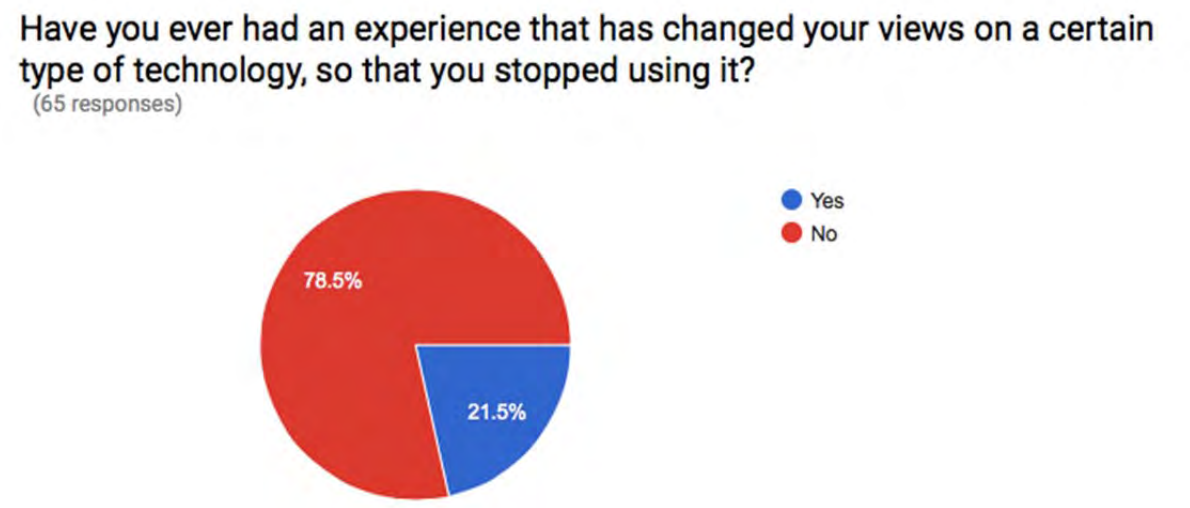


The needs of the academic environment were found to lead many respondents to start using different technology. For instance, people stated that they began using apps that were required for school, smartphones to keep up with emails, and laptops because it would be useful to be able to “type anywhere”. Using a specific product and seeing other people use the product lead some participants to start using a new product: one student said that they swore they would never get an iPhone, but changed their mind when they saw their peers using iPhones and realized an iPhone would be the easiest way to communicate with them since they all had one. In some cases, the capabilities, reliability and usefulness of a device (such as being able to FaceTime people and take quality pictures) lead people to start using technology, and in other cases, social media platforms such as Facebook helped users connect with friends and family. A

large amount of storage on a device and if a device seems “natural” were also emphasized as causing one to view a device positively and start using it.

v. Experiences that have caused someone to stop using a new technology

The very last question asked people whether they have had an experience that has changed their view on a technology so that they no longer used it. It is worth noting that this question received the fewest explanations of any survey question, probably because it had the fewest “Yes” answers of any question. The results can be seen in the pie chart below.



With this question, we find that experiences such as relationship issues (caused by Snapchat), being hacked and bad experiences with PCs lead respondents to stop using these technologies. Some respondents noted that they stop using things when they become outdated (such as how a phone can take the place of a watch), and one person said that they wouldn’t use

a product if it is made cheaply, such as a Fitbit. Additionally, some students reported they would like to switch from an Android phone to an iPhone (or vice versa) due to functionality issues such as battery life, or simply because they were not happy with the brand. Issues of battery life suggest that students want their phone to last longer than their expected lifespan, and that they may get rid of it because it is not performing well. This is akin to Seshadra and Chandrasekaran's point that people who wanted their phone to last longer than its expected lifespan were found to dispose their phones within two years. In this sense, we notice some overlap between how society at large and college students act when technology does not work as well as it used to.

We also discover that some people delete apps on their phone that they consider a distraction to simplify its use for only what they need. This relates to the point discussed earlier about how people can make smartphones "their own", as smartphones can easily be adapted to suit an individual's needs. The fact that reliance on technology makes it easier to become dependent on technology was also brought up as something that would turn people off from using a certain product. Furthermore, one student believes that social media apps have led to the "degradation and shallowing of society" in that they have made people obsess over self-and-peer images and adore those with money. This suggests that one may stop using social media if they see these trends emerging.

CHAPTER FOUR: DISCUSSION

INTRODUCTION

There is no doubt that technology is a major component of everyday life. This study attempted to determine how personal experiences affected technological attitudes. This section reviews the findings and suggests their significance.

I. Summary of Findings

Perhaps the most obvious finding from this study is that college students are very reliant (and almost dependent) on technology for everyday tasks. We discovered that most people started using computers at a younger age than either smart phones or iPads/tablets, and that, in general, the younger generation uses devices such as smartphones and computers more often than either iPads or tablets. The majority of respondents felt that technology is of greater importance to them in college. Most cited the ability to stay connected with friends and family while away at school and academic and social affairs on campus as reasons why technology is of greater importance to them in college. Those who reported technology as being of the same importance thought so because they use technology the same amount in college as in high school. Although some people identified more with one category than the other, they did state how some functions of technology (such as using it for schoolwork) became more important in college, while other abilities (such as using technology for social reasons) became almost insignificant.

Every person believed that technology has made it easier for them to access information. Slightly over half of the respondents thought it would be easier to communicate via technology (texting, social media, e-mail, etc.) than it would be to talk to someone face-to-face, as they feel technology is more convenient, quicker and easier to use, and less awkward than an actual conversation. Having more time to think through answers was also mentioned as a benefit of using technology to communicate. Those who would rather talk in-person point out that speaking is more personalized and leads to fewer misunderstandings than methods such as texting.

Most students preferred to schedule a meeting with their professor via technology, and the same holds true if they were trying to schedule a time to go to the movies with friends. Those who are “pro-tech” for these situations noted that using technology is much more convenient for scheduling, as it is quick and easy, and provides them with written records that allow them to remember details and not forget to show up for a meeting. Students who are “anti-tech” said that they would prefer to speak in-person because speaking is more personal, and because they feel it is easier to schedule a time in-person.

Only one-third of respondents believed that technology has isolated socially them. Those who have experienced technology-induced social isolation explain the fact that technology has caused less human interaction, makes conversations disingenuous, and has caused them to miss out on making new friends. However, almost all participants agreed that technology can have unintended consequences such as environmental destruction and a decline in the quality of relationships. 60% of students said they would feel insecure without their smartphone, as they would be unable to access information, and would feel left out because they would be unable to contact others. Others think that a smart phone provides comfort in difficult situations, and they

would feel insecure without this “safety net”. Additionally, without a smart phone, several respondents said they would feel unsafe and disorganized.

Participants would view a technology in a positive manner if it was easy to use, and able to accomplish tasks, and if it enhanced their quality of life and relationships. Technology would often be viewed negatively if it diminished the quality of relationships, was distracting and hard to use, and if one could easily become consumed by it. Convenience and the ability for communication and access to information were often discussed as the most important reasons for why one would use a certain device. In some cases, seeing friends use technology and whether the user had a good experience with a product would also lead one to see technology as positive.

Nearly 70% of students remarked that their experiences with technology have been mostly positive. Respondents often cited their best experiences with technology as being able to connect with friends and family who are far away by using platforms such as Facebook, Skype, WhatsApp and e-mail. Access to information and the ability to stay organized and do schoolwork were also listed in this category. In terms of negative experiences with technology, most respondents commented that technology shutting down, malfunctioning, and/or breaking when doing schoolwork, communicating with others or trying to access information was their worst experience with technology. Students also described their worst experience with technology as having come when technology caused social issues. Choosing to communicate via technology ultimately detracted from personal interaction and caused tensions among friends due to miscommunication and misinterpretation, issues which could have been avoided through a face-to-face encounter.

Only one-third of respondents reported that they have had an experience that has changed their views on technology so that they started using it. However, those who can attest to this

mentioned that the capabilities, reliability and usefulness of a device led them to start using it, and that societal requirements, such as needing devices and apps for school, also caused them to use new technologies. Others observed that seeing their peers use a device would often cause them to buy the device and begin to use it, and some noted that trying out a product changed their views on it and lead them to start using it. Similarly, most respondents have never had an experience that changed their views on a certain technology so that they stopped using it. Nevertheless, those who have stopped using technologies did so due to relationship issues, being a victim of hacking, and having used products that were cheaply made. Functionality issues and not being happy with a certain brand were also emphasized, as well as having too many distracting apps. Additionally, people noted they would stop using a certain product if they saw people become dependent on it. The fact that social media apps have made people obsess over how others see them and envy their peers would also lead people to quit using technology.

When we ran cross-tabulations in SPSS for the effect of gender on technological use and attitudes, we found that women use their smart phones to a greater degree than men. Roughly the same number of males and females used iPads for under 2 hours a day, and women were slightly more likely than men to prefer face-to-face communication than talking via technology. More females than males said that technology use has not caused them to experience isolation, and men were somewhat more likely than women to feel anxious without access to technology. Despite these differences, sex does not seem to have a strong effect on shaping technological use or perceptions.

II. Significance of Findings

Our data has several implications. First, we found that most respondents began using computers at a younger age than either smart phones or iPads/tablets. Most students first used a computer before they were eight years old, whereas most people did not start using a smart phone or iPad/tablet until they were between twelve and eighteen years old. Furthermore, hardly anyone started using a smart phone, iPad or tablet before age eight. This suggests that, when first learning to use technology, people think computers are a good starting point, as using a computer can help one develop basic technological skills which can be applied to other devices that can fulfill many of the same tasks as a computer, such as smart phones and tablets.

Smart phones and computers are more popular among college students than either iPads or tablets. This could be because people prefer smart phones and laptops such as the MacBook Air, which are often smaller, sleeker and easier to transport than an iPad or tablet. Indeed, some participants reported that they would use a device if it was small, as one student said "(I don't want to lug around a boulder)" and another remarked they would use it if it was easy "to carry around". This difference in popularity could also be attributed to the fact that students simply do not feel the need to have an iPad or tablet, as smart phones and computers can essentially fulfill the same purpose as one another. One student explained that "for some technology the use is niche, but nowadays most pieces of technology are able to emulate others, for instance a phone can act as a computer for surfing the web, sending emails, it can be a phone, it can be a game system, and so many people get for instance smart phones because of how many roles that piece of technology can fulfill".

The fact that nobody believed that technology is of less importance to them in college than prior to college suggests that students need technology to perform daily tasks (at least to a

certain degree). Over three-quarters of respondents wrote that technology is of greater importance to them in college largely due to the need to keep up with academics and campus life, as well as to stay in touch with peers. From this data, we can infer that the demands and expectations of one's surrounding environment have a tremendous influence on how necessary one thinks technology is, and how they will use it. Similarly, no one said that that technology has made it more difficult for them to access information in college, which implies that people like technology because it can provide them with a wealth of knowledge.

Since most respondents commented that they found it easier to communicate via technology and would rather schedule meetings with professors and friends via technology than in-person, we can determine that technology is becoming the preferred method of communication among the younger generation in (almost) all situations. If these questions were presented to older adults, the responses might be very different. Younger people are often more tech-savvy than older people, as rapid developments in digital technology have largely occurred over the past 40 years or so. Differences in communication preferences may lead to a disconnect between the younger and older generations, which may hinder the ability for young people to form bonds with their elders; as many young people may think that they cannot relate to someone who would prefer to talk to them in-person rather than through technology.

It is also reasonable to conclude that technology makes people lazy, as supported by one person's response, "Why would I waste my time walking to a professor's office just to schedule a meeting? I would rather send an email and just have a time locked in so as to not waste my time". However, some would prefer to plan things in-person, as they feel that talking is more genuine, and because it avoids the annoyance and difficulty associated with sending multiple texts or e-mails. The different interests could also be due to different personalities, as some

respondents pointed out that they are better at writing than talking, and some mentioned how they get nervous talking face-to-face.

Over 80% of people believed that technology can have unintended consequences, which shows that college students are aware enough to realize that technology is flawed, and that the risks of technology could potentially outweigh the benefits. Although only one-third of participants thought that their technology use has isolated them socially, these responses highlight the reality that technology can consume people and degrade the quality of conversations and relationships. Most respondents reported that they would feel insecure without constant access to their smart phone, as it would leave them feeling “naked”, “unsafe”, and “anxious, as if I’m left out”. These answers highlight the reality that technology has the power to preoccupy users and affect how one feels about themselves to the degree that people feel as though they cannot operate without a smart phone.

People stated that they would view a certain technology positively if it is easy to use and provides benefits such as communicating with friends and access to information. This shows that students are often concerned with the functions of technology, and will do their research before buying a new product, since they want to ensure it can benefit them. Technology would also be viewed emphatically if it improves one’s quality of life and helps society, which suggests that people are concerned with the “big picture of technology”, in terms of how technology can make them feel and how it can affect others. Respondents were likely to view technology negatively if it was difficult to use, easy to become consumed by, and if it could potentially cause a loss in social confidence. Once again, this data shows that people often look at technology from both a personal and “big picture” perspective.

Contrary to pre-conceived notions that technology use among college students is largely due to the influence of peers and the types of experience one has had using it (as is the case in larger society), the data shows that, in most cases, nearly everyone reported convenience, user-friendliness, and the ability to communicate and access information as the most important factors that would lead them to use a certain device. We see here that most students are only concerned with the capabilities of a device and how it can benefit them when deciding whether to use it. This also suggests that the influence of peers and previous experiences are, at best, secondary factors in one's decision to use or avoid technology. This phenomenon could also be an artifact of social acceptability. People may not want their colleagues to think that they do not make these decisions for themselves (i.e., that they are just simply copying their peers). It is important to keep in mind that what students are consciously aware of may be different from what is going on with them under the surface.

Regarding personal experiences, technology has been great in that it has connected students with their friends and family and has provided them instant access to information. However, it has also shut down, froze and broke on respondents, and caused communication problems. This data is important in that it shows both sides of the spectrum, and can make people realize that technology can often have unforeseen consequences such as friendship issues. Since most of our sample reported not having had an experience that changed their views on a certain type of technology so that they began or quit using it, we can infer that most students are happy with the technology they choose to use. Nevertheless, some began using technologies based on the needs of their work environment, which shows that society often forces one to adapt, even though they may not want to. This relates to Webster's statement that technology directors believe that people should "keep up with technology", as they will be left behind without it.

Functionality issues, relationship problems and issues of over-dependence lead some respondents to stop using technology, which shows that students are judicious enough of the imperfections in technology to quit using it before it makes their problems worse.

Many participants pointed out that technology has caused them more harm than good, as they discussed how technology can cause a decline in the quality of relationships and lead to reliance and dependence. This goes to show that people may not realize the "dark side" of technology until they encounter a negative by-product of technology, such as social isolation. Interestingly, although some respondents mentioned that they had been hacked, very few seemed concerned about issues of security. This may be because my questionnaire did not ask about security, or because students do not often experience issues of security with their devices.

In general, we learned from our analysis that sex is largely a non-factor in determining how one uses and sees technology. Men and women often use technology to the same degree as one another, and usually take the same stance on it. These findings indicate that these men and women consider technology to be of equal significance, and highlight the reality that technology has become increasingly important in recent decades. The data also suggests that people will continue to use technology to the same (or a greater) degree in the future and will still hold technology in high regard if they feel it can benefit them. However, the one exception to the consensus is that women use their smart phones more than men, which indicates that females are more reliant on their phones than men. Whether men or women feel more attached to their mobile device would be an interesting area for further investigation.

CHAPTER FIVE: CONCLUSIONS

I. SUMMARY

The goal of this study was to determine the extent to which attitudes and personal experiences with technology impacted how college students perceive technology, and if they would end up using certain technologies Does personal experience with technology cause someone to use technology? Many respondents have become so reliant on technology to the point where they feel as though they cannot function without it. Investigating technology among college students has provided insight into how the younger generation uses technology, and the rationale for why people use certain kinds of technology.

Overall, findings indicate that college students are most likely to begin using technology if it is convenient, allows them to communicate and access information, and benefits them. As per the data in the literature review, in society at large, people's personal experiences with technology shaped their perceptions of a device, and the persuasion from peers and the media also played a large role in determining whether someone would end up using a certain technology. However, when we examined the data concerning why a college student likes or dislikes a certain technology and why they will or will not use it, the results were very different. Personal experience and the influence of peers rampant in wider society took a back seat to factors such as a device's convenience, abilities and how it can benefit the user.

II. LIMITATIONS

This study has numerous limitations. The sample population was restricted to 502 students out of approximately 2,200 students at a small liberal arts college, therefore preventing us from generalizing about a larger group, or the entire population of the U.S. Furthermore, with only 68 responses, it is difficult to run a multivariate analysis of how technological attitudes and use differ by age, class year and sex.

When the study was initially sent out to a random sample of 502 students, the response rate was quite low. Therefore, to acquire more responses, the questionnaire was sent out two more times. The subsequent notifications yielded slightly more data, although the final response rate was still low, with only 13.9% of people having participated.

As a cross-sectional study, the data was constrained to analyzing a group of students during a specific moment in time. To some extent, we successfully gauged how students' technological views and usage have changed over time. However, a longitudinal study would have provided more insight into the extent to which these technological views and uses may change in the future. Moreover, since this project only focused on students, we are not able to generalize relationships with technology for everyone on a college campus, as faculty and administrators may view and use technology differently than students. Lastly, we must also recognize the reality that technology is constantly changing. As a result, the data from this study may be very different from that of a similar project conducted a few years from now.

III. FUTURE RESEARCH

While previous literature has provided valuable insight into the positive and negative consequences of technology, this thesis focused on how perceptions and personal experiences affect college students' use of various technologies. It would be interesting to see how faculty members' views and use of technology differ from those of students, as this would allow us to gain a broader understanding of how all persons affiliated with a college perceive and use technology. Future research could take the results from this study and conduct similar studies of other groups to see if these findings hold true for people of different ages, professions and countries. Exploring whether gender has any influence on technology within society at large would also help us discover whether a person's biological makeup can aid our understanding of technology. Our data provides a starting point for this, however these are preliminary findings worthy of more research in the future.

Furthermore, prospective research could do a longitudinal study of this topic, and compare how college students' relationships with technology change over time and vary across regions. Administering similar studies at regular intervals would also provide us with a working knowledge of technological trends and their implications for society, and enable us to react to these patterns in a timely manner to mitigate the negative effects of technology. Ultimately, if this study were to be conducted and analyzed over a longer duration of time with more participants, we would acquire greater knowledge of the extent to which college students' technological attitudes and experiences affect technology use in wider society today.

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APPENDICES

Appendix A: Letter Sent to Subjects

The following e-mail was sent to subjects to invite them to participate in this study and to inform them of the purpose of this study.

Hello,

My name is Patrick Gardner, and I am a student at Union College in Schenectady, NY. I am inviting you to take part in a research study for my senior thesis. Involvement in the study is voluntary, so you may choose to participate or not. A description of the study is provided below.

The survey will take less than 10 minutes to complete. I am interested in learning about the factors that influence technological perceptions and usage. You will be asked to answer questions regarding your background, attitudes toward technology, and how your experiences affect your perceptions of technology.

Besides the amount of time it will take you to complete this survey, there is no foreseeable risk to participating in this study. You do not have to answer any questions you do not want to, for any reason. If you no longer wish to participate in the study, you have the right to withdraw, without penalty, at any time.

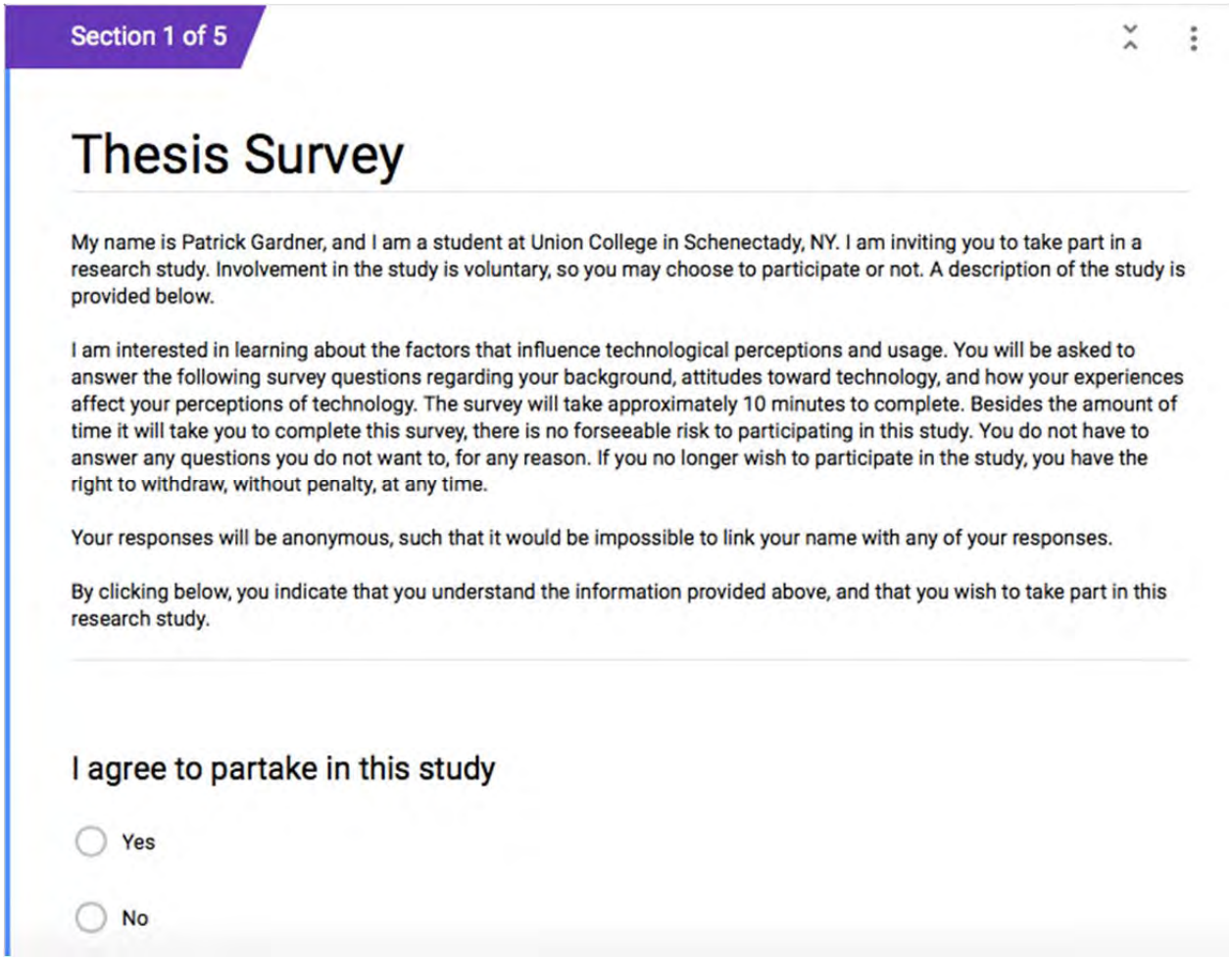
Your responses will be anonymous, such that it would be impossible to link your name with any of your responses. If you have any questions or concerns, feel free to contact me via e-mail at gardnerp@union.edu.

Thank you very much for helping me with my research! Please complete the survey by following this link:

https://docs.google.com/a/union.edu/forms/d/10dA_9tKlwuJwRBJxCDdhjuNA1arZB7PMlK0E9RnkY1Q/edit

Sincerely,
Patrick Gardner

Appendix B: Survey Questions



Section 1 of 5

Thesis Survey

My name is Patrick Gardner, and I am a student at Union College in Schenectady, NY. I am inviting you to take part in a research study. Involvement in the study is voluntary, so you may choose to participate or not. A description of the study is provided below.

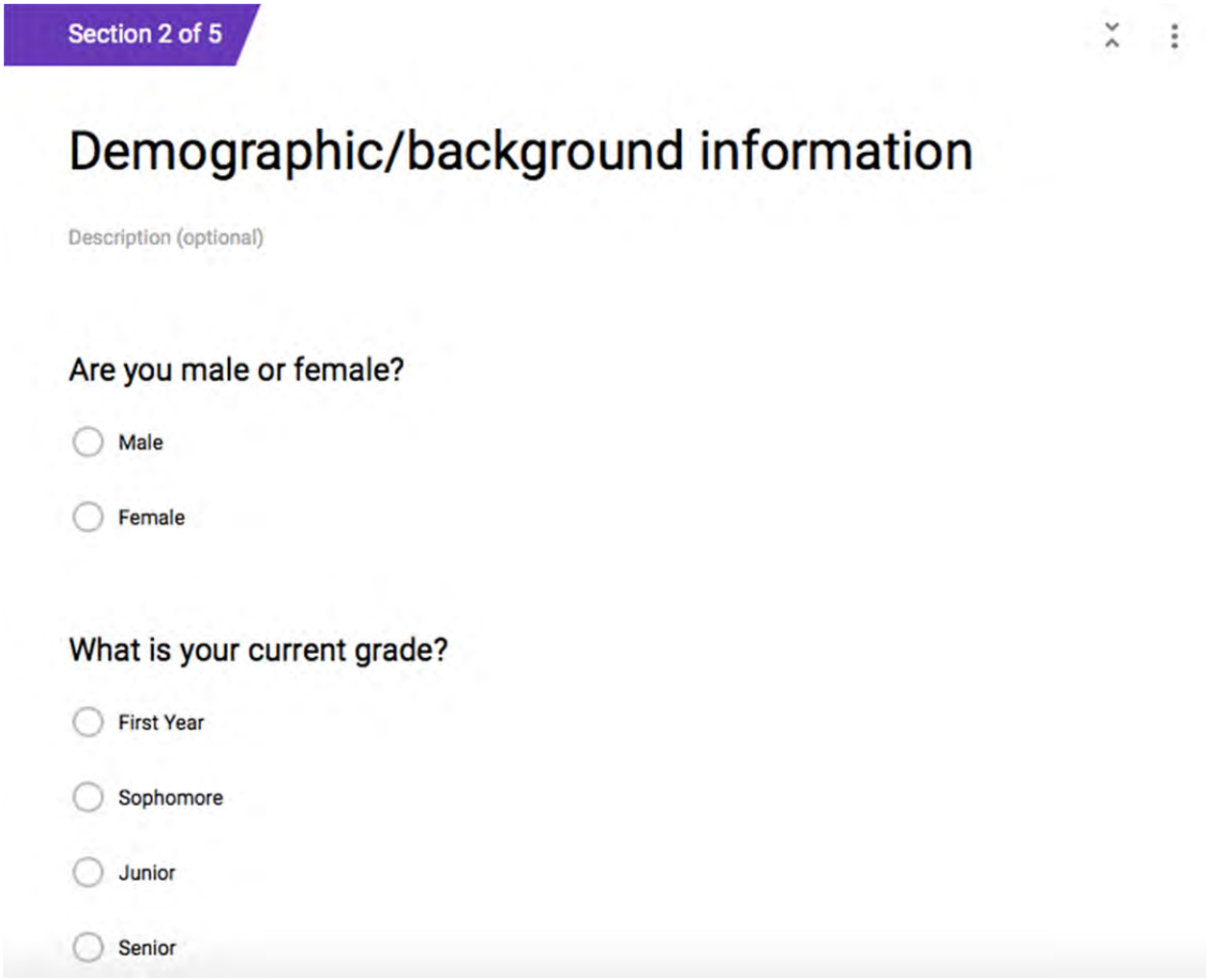
I am interested in learning about the factors that influence technological perceptions and usage. You will be asked to answer the following survey questions regarding your background, attitudes toward technology, and how your experiences affect your perceptions of technology. The survey will take approximately 10 minutes to complete. Besides the amount of time it will take you to complete this survey, there is no forseeable risk to participating in this study. You do not have to answer any questions you do not want to, for any reason. If you no longer wish to participate in the study, you have the right to withdraw, without penalty, at any time.

Your responses will be anonymous, such that it would be impossible to link your name with any of your responses.

By clicking below, you indicate that you understand the information provided above, and that you wish to take part in this research study.

I agree to partake in this study

- Yes
- No


Section 2 of 5
Demographic/background information
Description (optional)
Are you male or female?
Male
Female
What is your current grade?
First Year
Sophomore
Junior
Senior

How old are you?

- Under 18
- 18
- 19
- 20
- 21
- 22
- Over 22

Section 3 of 5

Technological Perceptions

These questions explore some of the ways you use technology.

About how old were you when you first used a smart phone?

- 6 or younger
- 6-8
- 8-12
- 12-18

About how old were you when you first used a computer (laptop, PC)?

- ○ 6 or younger
- ○ 6-8
- ○ 8-12
- ○ 12-18

About how old were you when you first used an iPad/tablet?

- ○ 6 or younger
- ○ 6-8
- ○ 8-12
- ○ 12-18

About how often do you use a smart phone on a daily basis?

- Less than 2 hours
- 2-4 hours
- 4-6 hours
- 6 hours or more

About how often do you use a computer (laptop, PC) on a daily basis?

- Less than 2 hours
- 2-4 hours
- 4-6 hours
- 6 hours or more

About how often do you use an iPad/tablet on a daily basis?

- Less than 2 hours
- 2-4 hours
- 4-6 hours
- 6 hours or more

In terms of technological importance, do you feel that technology (smart phones, laptops, television, etc.) is of greater importance, the same importance or less importance to you now (in college) than before you came to college?

- ◯ Greater importance in college
- ◯ Same importance in college
- ◯ Less importance in college

Please briefly explain why you feel this way (see previous question)

Long answer text

In general, do you feel that technology has made it easier for you to access information?

- ◯ Yes
- ◯ No

Do you think it is easier to communicate with others via technology (text messages, social media, e-mail, etc.) or in-person?

- ◯ Via technology
- ◯ In-person

Please briefly explain why you feel this way (see previous question).

Long answer text

Imagine you have to schedule a meeting with your professor. Would you prefer to do this in-person or via e-mail?

- ◯ In-person
- ◯ Via E-mail

Please briefly explain why you prefer this way of communicating with your professor (see previous question)

Long answer text

Imagine you are planning a time to go to the movies with friends. Would you prefer to do this in-person or via technology (texting, calling, social media, etc.)?

- ◯ In-person
- ◯ Via technology

Please briefly explain why you prefer this way of communicating with friends (see previous question)

Long answer text

Do you feel that your technology use has isolated you socially (made it harder for you to establish friendships)?

- ◯ Yes
- ◯ Somewhat
- ◯ No

If yes or somewhat, please explain briefly (see previous question)

Long answer text

Do you feel that technology can have unintended consequences (environmental harm, decline in the quality of relationships, etc.)?

- ◯ Yes
- ◯ No

Do you feel insecure without technology (i.e., not having your smart phone at all times)?

- ◯ Yes
- ◯ No

If yes, please explain briefly (see previous question)

Long answer text

In your opinion, what is the most important thing that leads you to view a particular technology positively or negatively? Please explain briefly.

Long answer text

In your opinion, what is the most important thing that leads you to actually use a particular type of technology? Please explain briefly.

Long answer text

Section 4 of 5

Personal Experiences with Technology

Description (optional)

Have your experiences with technology been mostly positive, mostly negative, or a mix of the two?

- ◯ Mostly positive
- ◯ Mostly negative
- ◯ Mixture

What has been your best experience with technology? (i.e., allowed you to find information you needed, helped you connect with friends/family, etc.)

Long answer text

What has been your worst experience with technology? (i.e., hasn't worked, shut down when you were using it, has prevented you from accessing information, etc.)

Long answer text

Have you ever had an experience that has changed your views on a certain type of technology, so that you began using it?

- Yes
- No

If yes, please explain briefly (see previous question)

Long answer text

Have you ever had an experience that has changed your views on a certain type of technology, so that you stopped using it?

- Yes
- No

If yes, please explain briefly (see previous question)

Long answer text

Section 5 of 5

Debriefing Statement

Description (optional)

Thank you for participating in my senior thesis study. Your responses have made it possible to understand how demographic factors affect technological perceptions and usage here at Union. If you have any questions or concerns, feel free to contact me via e-mail at gardnerp@union.edu. Thank you so much!

Long answer text