

# **FINAL DRAFT**

## **TECHNOLOGY AND ADOLESCENTS: PERSPECTIVES**

### **ON THE THINGS TO COME**

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## ABSTRACT

Considering that teenage behavior forecasts future mass-market changes in the consumption of digital information, it would seem pertinent to study in-depth the characteristics of teenager technology use. The three key questions guiding this research were:

- What are the key patterns regarding the use of technology platforms by teenagers? This issue covered questions about the number of devices being utilized, their frequency and intensity of usage, the purpose of use, choice of technology, and patterns of consumption (hours per day on weekdays and week-ends, modes of communication by time of day)
- Segmentation: what differences can we identify in the above if data is segmented by type of high school and, by inference, teaching styles, culture, social segmentation, and processes of knowledge transmission? In other words, is technology usage among teenagers being shaped by the schools' disparate teaching philosophies and cultures, resulting in distinct behavior by each group of students? Or is the influence of technology so strong that it acts as a homogenizing factor, overriding any intentional differences driven by the school's culture?
- Impact: is there anything we can stipulate about the potential impact technology usage is having on cognitive ability, and the relation to information consumption (e.g. multi-tasking)?

To answer these questions, a survey was designed to determine how high school students use technology. The survey was distributed at two schools in the East Coast: a private boarding school in Concord, New Hampshire, and a public school in Manhattan, New York. These are some of the more relevant research results;

- Teenagers spend on average 554.8 minutes (or 9:25 hrs.) a day using technology devices during the week. New York public school students use all technologies more frequently (11.28 hrs.) than their counterparts at the boarding school (8.16 hrs.). This is most likely a direct consequence of the New York school's approach to technology usage of intense embedding of platforms in the teaching experience, augmented by the pressure of the urban context.
- Teenagers read for leisure an average of 5.6 books per year. Girls tend to read more than boys (6.6 vs. 3.9). This could be partly explained by a substitution effect with videogame playing since boys are the primary users of video games. New York public school students read significantly more than boarding school students (10.7 books versus 3.4). This could mean that, *prima facie*, boarding school schedules negatively affect leisure reading.
- Out-of-class reading is correlated with media and technology exposure. New York public school students systematically spend more time interacting with

digital devices and reading books. This finding would support two of the three hypotheses raised above. First, the school culture (public day versus private boarding) and the geographic context (city versus semi-rural area) are two factors driving specific behavioral patterns vis-à-vis technology usage. A school culture that incorporates technology into its curriculum and defines rules that encourage rather than prevent technology usage, combined with an urban context, might result in a stimulating environment for knowledge acquisition in all of its manifestations. Second, a complementarity rather than a substitution pattern appears to exist, whereby if teens are intense users of digital technology, they will remain frequent book readers. This would support the original media cumulative impact hypothesis.

- Overall 36% of teenagers report that they text in class. The proportion is significantly higher (48%) at the New York public school than at the boarding school, partly due to the “no cellphone” policy imposed at the latter school. On average students report sending 10.8 texts per class. Even in a school where cellphones are not allowed, such as the boarding school, texting remains significant.
- Teens self-report spending close to two hours a day on Facebook, with little differences between New York public school and the boarding school. Teenagers appear to be less prone than the general population to view pages of strangers or people to whom they are not close (we recognize that a bias could exist in self-reporting an activity that is not socially acceptable). As such, teenagers are more likely to rely on the social network for communication purposes. This trend reveals a shift in both attitudes and positioning of social networks from conventional networking sites to communications utilities.
- Seventy percent of high school students stream videos from the Internet more than they watch television. Two apparent trends are that within the same school, girls stream more videos than boys and that St. Paul’s students stream more than ICE students. One possible explanation for the gender-based difference is that girls and boys watch different programs. Boys typically watch more sports than girls do: 42.9% more in St. Paul’s case and at the ICE School, none of the girls surveyed watch sports programs.

In conclusion, contrary to the presumed homogenization of information goods consumption and communication patterns, the adoption and use of information technology are shaped by the individuals’ residing environment and context. Evidence indicates that school culture (public day versus private boarding) and the geographic context (city versus semi-rural) are two factors driving specific behavioral patterns vis-à-vis technology usage.

Furthermore, contrary to prevalent notions that indicate a substitution between information technologies (e.g. print by digital products, linear TV by over the top video streaming), consumption of information goods appears to be guided by a principle of

complementarity: if teens are intense users of digital technology, they will remain frequent book readers. However, substitution between technologies should not be discarded. Boys tend to spend much more time watching television and playing videogames than they do using PCs. Girls exhibit exactly the inverse pattern.

In this context, a school culture that a) incorporates technology into its curriculum, and b) defines rules that encourage rather than prevent technology usage might contribute positively to knowledge acquisition through all modes. On the other hand, technology adoption without controls could negatively impact the teaching experience (negative impact of text in classroom).

**“Pupils at Katete Girls Boarding School in Eastern Province yesterday rioted and destroyed school infrastructure and property worth about K54 million following a decision by the school management to confiscate their mobile phones if found with them in school premises” - Zambia Daily Mail May 22, 2012**

## **1. INTRODUCTION**

In 2008, Matthew Robson, a 15 year old high school intern at Morgan Stanley’s London office was given as an assignment to spend a few days asking his friends about their media and communications habits. After surveying a number of his acquaintances in a non-statistical fashion, he prepared a report that was published on the Internet by Morgan Stanley, causing a stir among technology investors. The main conclusions of the report were as follows:

- Online advertising is extremely annoying and pointless
- We cannot be bothered to read a newspaper
- We never buy CDs or use yellow pages and avoid paying for anything other than concerts or cinema tickets
- While cell phones are central to our social lives, we avoid buying expensive handsets for fear of losing them
- We do not use mobile internet as it costs too much and prefer game consoles (Xbox) for free chat
- In other words, we hate to pay for entertainment and communications
- We do not use Twitter because updating it from cell phones would use up credit better used to text friends

Two years later, the Kaiser Foundation published a report compiling the results of an annual tracking survey on technology use among teenagers in the United States. Its primary results, presented in table 1, provided a glimpse at the increasing exposure of adolescents to information technology.

**Table 1. Usage of Technology (in terms of hours per day)**

|                      | 1999 | 2004 | 2009  | Comments  |
|----------------------|------|------|-------|---|
| TV content           | 3:47 | 3:51 | 4:29  | The time watching TV is declining, with the difference going to PCs and cellphones            |
| Music/audio          | 1:48 | 1:44 | 2:31  |   |
| Computer             | 0:27 | 1:02 | 1:29  | 84% have internet access at home  |
| Video games          | 0:26 | 0:49 | 1:13  |   |
| Print                | 0:43 | 0:43 | 0:38  | Total reading time is decreasing, although most of it is due to less newspapers and magazines |
| Movies               | 0:18 | 0:25 | 0:25  |   |
| TOTAL MEDIA EXPOSURE | 7:29 | 8:33 | 10:45 | Biggest amount of time is clustered among 11-14 and African American/Hispanic youths          |
| Multi-tasking factor | 16 % | 26 % | 29 %  |   |
| TOTAL MEDIA USE      | 6:19 | 6:21 | 7:38  |   |

*Source: Kaiser, Henry J. "Daily Media Use Among Children and Teens Up Dramatically from Five Years Ago". Henry J Kaiser Foundation. (2010).*

According to the Kaiser Foundation research, in 2009, children between the ages of 8 and 18 spent 10:45 hrs. per day interacting with media platforms, of which only 38 minutes were spent reading print material. Twenty-nine percent of the total 10:45 hrs. occurred in a multitasking mode (i.e. interacting with more than one technology at the same time),

which meant that, in terms of actual hours, the time spent in front of a screen (be it television, computer, videogame console, or cellphone) amounted to 7:38 hrs. per day. This number had been increasing year after year although some clear substitution patterns had started to emerge (e.g. print to digital, television to video content streaming).

These two pieces of evidence, Matthew Robson's memo and the Kaiser Foundation report, demonstrate in both a qualitative and quantitative fashion the dramatic changes taking place in the pattern of adolescent information and entertainment content consumption. Considering that teenage behavior forecasts future mass-market changes in the consumption of digital information, it would seem pertinent to study in-depth the characteristics of teenager technology use. The three key questions guiding this research were:

- What are the key patterns regarding the use of technology platforms by teenagers? This issue covered questions about the number of devices being utilized, their frequency and intensity of usage, the purpose of use, choice of technology, and patterns of consumption (hours per day on weekdays and week-ends, modes of communication by time of day)
- Segmentation: what differences can we identify in the above if data is segmented by type of high school and, by inference, teaching styles, culture, social segmentation, and processes of knowledge transmission?
- Impact: is there anything we can stipulate about the potential impact technology usage is having on cognitive ability, and the relation to information consumption (e.g. multi-tasking)?

Underlying these questions are three hypotheses worth testing:

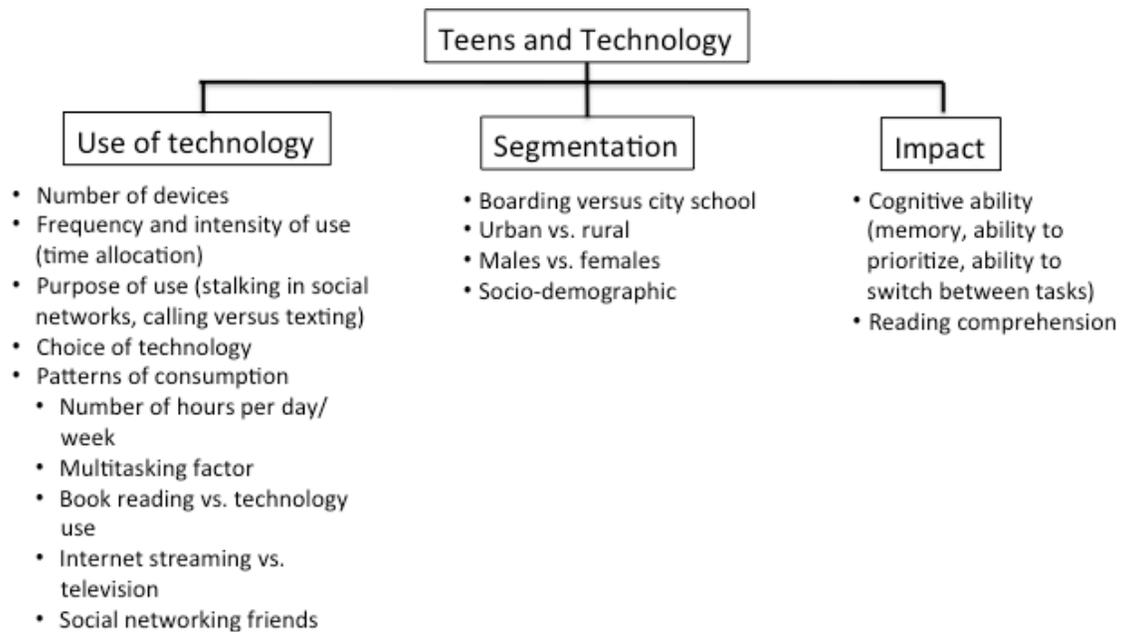
1. The adoption and patterns of utilization of information technology are shaped by the cultural parameters that characterize the environment and context within which individuals reside. In other words, contrary to a presumed homogenization of consumption of information goods and communication patterns, individual and social behavior regarding information technology usage is segmented according to pre-existing conditions.
2. Contrary to prevalent notions that indicate a substitution between information technologies (e.g. print by digital products, linear TV by over the top video streaming), consumption of information goods appears to be guided by a principle of complementarity. Following the cumulative media effects theory, the more intensely we consume digital goods, the more exposure we gain to print products.
3. While social networks tend to address social needs (or so-called “failures”), their usage, even within highly segmented socio-demographic categories, tend to be highly group specific

To answer these questions, a survey was designed to determine how high school students use technology. The survey was distributed at two schools in the East Coast: a private boarding school in Concord, New Hampshire, and a public school in Manhattan, New York. The survey is included in the appendix. This paper begins by reviewing the existing research on the topic and then proceeds to present the findings and analysis of results of the survey.

## **2. REVIEW OF THE LITERATURE**

An abundance of studies have been conducted regarding teenagers and their use of digital technology. The term digital technology refers to mobile phones, on the go devices, computer, televisions, and video game consoles. This review is structured around the three domains presented above: use of technology, segmentation patterns, and impact, according to the following roadmap (see figure 1).

**Figure 1. Study Roadmap**



## **2.1. Use of Technology**

### **2.1.1. Number of devices/Frequency of use:**

Most of the research on technology use among teenagers deals with the number of platforms and the frequency/intensity of use in a combined fashion. For example, a study conducted by Gross (2004) sampled a group of over 200 Californian public school students determining that, not surprisingly, the majority (91%) of teenagers use the Internet at least once a week, while 40% to 65% do so on a daily basis. In another study (Greenhow, 2009), over fifty percent of teenagers owned a cell phone, a gaming console,

a computer, and/or a portable gaming device. This, according to the author, allowed 94% of teenagers to surf the Web, do research, and access social networking sites. Furthermore, 59% of those teenagers using the Internet access it via a home computer, compared to 41% that do it at school.

Social networking is growing in popularity and coming to define technology use within this generation. Most teens engage in some form of social networking such as Facebook, Instant Messaging (IM), Twitter, and so forth. However, social networking has been so overwhelming to young teenagers that, in some cases, they wish to disconnect and create direct relationships (Rideout et al., 2012). Facebook is the most popular social networking site. Over time, teenage Facebook users feel more comfortable with their profiles, as they narrow their “friends”, making them less nervous about strangers (Pew Research, 2011). Many students have accounts on social networking sites, the majority being members of more than one site, visiting these sites multiple times throughout the day. Furthermore, they use social networking as a communication tool with people outside their direct circle. Sites such as Facebook aren’t used for direct communication, but more so for low responsive situations such as checking in with old friends as opposed to making plans with new ones (Coyle, 2008).

### **2.1.2. Purpose of use/Choice of technology:**

Given the variety of digital devices owned by teenagers, several patterns are apparent as to which ones are used for specific situations, as well as which are more popular than others.

#### ***Communications platforms:***

For communications purposes, a study by Schiano et al. (2002) determined that Instant Messaging (IM) is the most popular communication platform for direct communication among teenagers, while email is less popular. Teenagers use email to communicate with adults (teachers, family members, etc.), whereas they use IM to communicate with close friends on a daily basis.

According to Rideout (2012), the majority of teenagers (90%) use some form of social media, with 75% of this group having a social networking profile and 68% texting on a daily basis. In addition to communication, social networking sites are used for providing structured social interaction opportunities. For example, beyond communication and networking purposes, Facebook is being used as a gaming platform: Orbera (2010) determined that 81% of users play games via the site.

***Video consumption:***

Research on video consumption is indicating a fundamental change in the way teenagers consume video content. The television is slowly being phased out while Internet video streaming services are growing in popularity (Offerman, 2012). Wanner (2011) makes a similar point, concluding that on average, teens spend three more hours per week online than they do watching television. However, the trend toward relying on video streaming appears to be undergoing a reversal. Offerman (2012) also found that teens are more likely to sit through a linear TV program than endure the intense advertising prevalent in many video-streaming sites (Offerman 2012).

Beyond the pattern of substitution between live TV and video streaming, research indicates a replacement of print by video entertainment. For example, the Kaiser Foundation study mentioned above indicated that the total time teenagers spent reading

print media declined from 43 minutes to 38 in five years, while the amount spent playing videogames increased from 49 to 73 minutes in the same period. Coincidentally, Vann (2012) found that teens that play video games on a daily basis spend thirty percent less time reading than teens that do not play video games.

### ***Patterns of use***

Many patterns exist within how teens use technology due to the constant additions of new models and devices. Frequent use of technology is changing over time due to new products. As smartphone ownership rates increases, time spent on social networking sites increases as well. Similarly, multitasking becomes a more frequently adopted ability by teens as they use their smartphones to watch videos, access social networking sites, and also send text messages and place phone calls (Vahlberg 2012). Magazine and newspaper reading has become a less sought after activity among teens in the past five years. However, time spent reading books has increased (Vahlberg 2012). Live television continues to be the primary source for video, although streaming online video is becoming increasingly popular within the teen community (Children and parents 2011).

### ***Complementarity of technologies:***

Beyond the substitution trends identified above, some studies point at the complementarity of technology platforms. For example, Lenhart (2012) surveyed teens who frequently text, discovering that individuals who text more also call more. Likewise, individuals with social networking accounts use more technology than individuals who do not participate in social networking sites (Lenhart 2012).

## **2.2. Segmentation**

In addition to the aggregate trends reviewed above, several studies focused on identifying differences in teenage behavior across geographic, gender-based, and socio-demographic segments. .

### **2.2.1. Urban versus rural usage patterns:**

Gilbert et al. (2008) analyzed teenagers' usage within various communities, comparing urban and rural settings. The authors found that individuals living in rural environments use social networking less than individuals living in urban environments. Furthermore, teenagers living in urban areas have more online friends, upload more pictures, and communicate more via social networking sites in general. The authors concluded that urban communities are the most prominent users of social networking sites due to their geographic proximity. Rural communities live in closer social proximity to one another and therefore demand less technology use for communication purposes, whereas individuals from an urban setting are more likely to demand communication with individuals at a further distance. Coincidentally, a study by Koprowski (2006) pointed to limited accessibility (limited coverage, low quality of service) as the primary culprit behind limited social networking in rural areas.

### **2.2.2. Gender differences:**

Multiple studies have also highlighted gender-based differences in technology usage. . For example, Mazaman (2011) determined that teenage males and females use social networking sites very differently. The author distinguished the top four reasons individuals use Facebook and other sites: to keep old friendships, establish new ones, request information related to academics, and specific interest requests. In this context, males use social networks to communicate and create new friendships, whereas the

females' primary purpose is to maintain established friendships. A study conducted by the Pew Internet Research Project also found gender differences in technology usage, concluding that of the 71% of teenagers who own cell phones; females on average use their mobile phones much more than males (Pew, 2009). IM is also a popular technology among the teen girl population, with females comprising over 50% of its user base. (Schiano et al., 2002). As the prominent owners of video game consoles and participants of online and live television video games, males have very specific technology patterns as well.

### **2.2.3. Socio-economic differences:**

Beyond geographic and gender differences, income appears to also be a discriminating factor in explaining technology usage among teenagers. Murphy (2011) determined that 70% of low-income families own a computer, compared to 92% of average-income households. The author also determined that mobile phones are the main communication platform within low-income households. Furthermore, Greenhow et al. (2009) determined that low-income families on average have fewer devices and therefore have to share their use, limiting the time spent using technology.

## **2.3. Impact**

Beyond usage patterns across segments, researchers are starting to focus on the potential impact technology might be having on teenagers. So far, studies have been conducted in areas such as reading comprehension and cognitive ability.

### **2.3.1. Reading comprehension:**

While text messaging is an extremely popular use of technology, a recent study argues that it can negatively affect cognitive ability (Jonge 2012). The author compared reading

comprehension and texting patterns within a group of 100 13 to 24 year old participants, concluding that the more an individual texts, the worse his / her reading comprehension and general writing ability is. According to the author, this is the case because the 160-character limit in text messages forces teenagers to compact their text and use word shortcuts, which appear to impact their comprehension negatively. Having said that, with the character limit non-existent within email and smartphones, this tendency could be reversed.

### **2.3.2. Cognitive abilities:**

Given the abundance of technology offered to teenagers, multitasking is becoming a fairly common technology usage pattern. Grabmeier (2012) observed a group of college students' social media use while each student tried completing a cognitive task (reading, studying, etc.). The study concluded that multitasking makes cognitive tasks more enjoyable, but equally less efficient. Similarly, Gorlik (2009) tested a group of self-proclaimed multitaskers versus non-multitaskers in a variety of tasks. After showing all participants a combination of images that tested memory, ability to prioritize, and ability to switch between tasks, the author found that not only do multitaskers have poor memories, they are also easily distracted by irrelevant information, and therefore less able to switch between tasks. Coincidentally, Vahlberg (2012) found multitasking to be fairly common within the teenage community, where over ten hours per day are consumed by multiple tasks at once, rendering teenagers less and less efficient.

## **2.4. Conclusion**

Research has identified a number of consistent trends concerning the use of technology by teenagers (see table 2).

**Table 2. Summary of Research on Technology Usage by Teenagers**

| <b>Research Domain</b> | <b>Sub-domain</b>                     | <b>Finding</b>  |  |
|------------------------|---------------------------------------|---|--|
| Use of Technology      | Number of devices/Frequency of use    | <ul style="list-style-type: none"> <li>• 91% of teens use the Internet; 40-65% of those on a daily basis (Gross, 2004)</li> <li>• 59% of teens using the Internet, do so from home, while 41% do so at school (Greenhow, 2009)</li> <li>• 75% of teens belong to social networking sites (Rideout, 2012)</li> </ul> |  |
|                        | Purpose of use / Choice of Technology | Communication platform  | <ul style="list-style-type: none"> <li>• Email is used by teens to communicate with adults, as opposed to using social networking sites, text, or IM that is used for direct communication with close friends (Schiano, 2002)</li> </ul>   |
|                        |                                       | Video consumption   | <ul style="list-style-type: none"> <li>• 95% of teens have access to television (UKOM Nielse, 2011)</li> <li>• Linear TV is still the most popular source of video (Offerman, 2012)</li> <li>• Advertisement continues to influence television patterns (Adobe, 2012)</li> </ul> |
|                        |                                       | Complementarity   | <ul style="list-style-type: none"> <li>• Individuals who text more, also use their phones more (Lenhart, 2012)</li> <li>• Teens spend more time on their computers than they do watching television (Wanner, 2011)</li> </ul>  |
|                        | Patterns of consumption               | <ul style="list-style-type: none"> <li>• Teens text messages more than they place phone calls (Vahlberg, 2012)</li> </ul>   |  |
| Segmentation           | Urban vs. rural                       | <ul style="list-style-type: none"> <li>• Individuals from urban communities rely more on social networking, have more friends, pictures and general activity than individuals from rural areas (Gilbert, 2008)</li> </ul>   |  |
|                        | Males vs. females                     | <ul style="list-style-type: none"> <li>• One third of boys play video games compared to one tenth of girls (Vann, 2012)</li> <li>• Males use social networking sites to communicate with new friends, whereas females use these sites to strengthen already existing relationships (Mazman, 2011)</li> </ul>        |  |
|                        | Socio-economic                        | <ul style="list-style-type: none"> <li>• 70% of low income families have Internet access, compared to 92% of higher income families (Murphy, 2011)</li> </ul>   |  |
| Impact                 | Reading comprehension                 | <ul style="list-style-type: none"> <li>• Teens who text amore re more likely to have more difficulty in reading comprehension (Jonge, 2012)</li> </ul>  |  |
|                        | Cognitive abilities                   | <ul style="list-style-type: none"> <li>• Multi-tasking negatively affects teen’s cognitive ability by worsening their memory, ability to switch between tasks and prioritize information (Gorlik, 2009)</li> </ul>  |  |

On the other hand, the research has not yet addressed several areas. While studies on social networking behavior have been already done, analyses have focused on typical patterns such as number of friends or frequency of access. However, “stalking”<sup>1</sup>, a widely acknowledged Facebook behavior, has not been as popular in recent studies.

In addition, segmentation studies have addressed either demographic or geographic differences, but have not focused on understanding technology use between teens that attend different schools, as reflective of different teaching philosophies. For example, no research has been conducted comparing students from public versus private institutions or boarding school students.

When it comes to usage, very little research addresses the complementarity and/or substitution of different technologies. For example, how much is technology usage increasing in terms of frequency and intensity? Is any particular technology stimulating usage of others? What are the substitution patterns?

Finally, partly due to the speed with which some technology usage trends are developing, areas such as streaming video online have not been widely discussed in the research. Many studies have compared live television to video on demand, which includes downloading content from the Internet. However, video on demand may also refer to purchasing a movie via the television, a different mode of acquisition from video streaming. The idea of streaming television, live and previously recorded, is a new phenomenon within the teen community that has not yet been fully addressed.

### **3. A COMPARATIVE STUDY OF TECHNOLOGY USE:**

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<sup>1</sup> “Stalking” is a term used to describe the action of visiting the profile of a Facebook friend who does not belong in the user’s close social circle.

In order to address some of the issues discussed above, a study was launched to examine how teenagers of different socio economic background, geographic location, age and gender use technology. Technology, in this case, comprises all forms of social media and social networking, as well as television programs and computer use. These forms of technology are accessible through mobile phones, on the go devices such as e-readers and iPads, as well as on computers and television. The study specifically analyzed the use of Facebook, mobile phones, online video on demand sites (such as Hulu and Netflix). The research was conducted through a survey of students from the Institute for Collaborative Education, a public middle and high school located in downtown Manhattan, as well as students from the St. Paul's boarding school, located in Concord, New Hampshire.

### **3.1. Two Different Schools:**

#### **3.1.1. ICE:**

The Institute of Collaborative Education (ICE), a public middle and high school located in downtown Manhattan, has 486 students, of which 251 are in high school<sup>2</sup>. Students who attend ICE come from all five boroughs. The average ICE student may live in small apartment with four other siblings in the Bronx, a brownstone in Brooklyn, a loft downtown, or a townhouse on the Upper East Side. There is no information on average household income for ICE students, but they come from a wide range of social and economic environments. In fact, ICE is a relatively diverse community with 51% of the student body being Caucasian, 21% Hispanic, 10% black, 5% Asian, and 13% other.

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<sup>2</sup> Only high school students from ICE were recorded and analyzed for the purpose of the study, however the demographics represent the school as a whole.

The school has 90 faculty members. Founded in 1995, the school describes its teaching philosophy as follows: “(it is) designed to give students the skills needed to be successful in college and beyond. ICE has developed a comfortable but academically stringent learning environment. Using rigorous custom-designed curriculum, we challenge students with graduation requirements that surpass state Regents examination and commencement standards, supporting them as they develop a portfolio of their best work. We use multi-grade, school-wide projects to explore essential questions that deal with social responsibility and justice, and the world beyond our school doors”. (Institute for Collaborative Education, 2012)

All ICE students live at home. The typical ICE student takes a thirty-minute subway ride to school and attends his first class at 8:30 in the morning. Once in school, he moves with the same group of less than twenty students to and from each class. Teachers, ranging in age, race, and education level, encourage group and project-based work, demanding intense use of the Internet, as well as reliance on Manhattan’s urban environment. Students commonly text message throughout their classes and access Facebook and other applications via their smartphones or laptops while in class. Most teachers at ICE allow cell phone and computer use through lectures, discussions and study hall periods. Advisory, known as homeroom in other schools, is a semi-weekly period within the school day designed to provide all students with the chance to socialize and/or study. Many students use advisory to access social networking sites, and continue through their use of technology. Students of both the middle and high school are given the same hour lunch period when they are permitted to leave the school building to purchase food from other local stores. Lunch is a social hour where many students will

bring out their laptops at the local grocery or diner. Smartphones are in abundance throughout lunch and on throughout the day. ICE focuses on every student's creative ability, as opposed to their testing or studying skills. ICE students are notoriously creative, diplomatic and well-expressed individuals who encourage debate and discussion on a variety of topics. They are taught to think "outside the box" and extend their minds beyond the typical solution to any obstacle they encounter, allowing them to prioritize, multitask, observe and create.

However, ICE students have specific difficulties that are a product of the school's philosophy. ICE students commonly lack the ability to focus due to the relaxed class environment. Their difficulties also include memorization, specifically in regards to studying, as well as "shutting down." The entirety of an ICE student's day is engaging with many aspects of technology. Similarly, students commonly feel that they are lacking vocabulary and basic grammar skills. Although taught to write *expressively*, ICE teachers do not teach students all the skills to write *correctly*. The philosophy of the school remains that it is more important for students to possess the skills to say something meaningful than to say something grammatically correct.

### **3.1.2. Saint Paul's School:**

St. Paul's is an Episcopal high school in Concord, NH that was founded in 1856. It is an all boarding school, which means that the entire student and faculty population lives on campus. There are 540 students at St. Paul's from thirty-five states and sixteen countries.

St. Paul's student body is comprised of 38% Black and Hispanic, with 18% being international students. 36% of students receive financial aid with the average grant of \$41,660 covering over 90% of the tuition.

Unlike ICE, classes in languages, math, and science are based on ability rather than age. The one exception is the humanities curriculum, a combination of English and History, which is done by grade.

Although St. Paul's is only five minutes away from Concord, NH, students mainly make use of the resources at St. Paul's rather than go into town. Cell phones are discouraged. Students are not allowed to use them during class and are not supposed to use them between classes either. There is also no AT&T coverage on campus, which further discourages cell phone use.

Although it is not required, the vast majority of students have their own laptops. Laptops are allowed in some classes but are not needed, and most students do not bring them to class. Technology is not frequently used in the classroom; most of the teaching is done traditionally with blackboards and textbooks.

Although there are no policies on television viewing, most students do not watch television on a day-to-day basis. The only televisions accessible to students are in common areas so they are exclusively used for group activities such as watching sports or movies.

St. Paul's focuses on academic ability and has high expectations for its students. There are many academic awards at the end of the year awarded for ability in a class as well as for grades, which help to encourage hard work. A *C* grade in any class will make a student ineligible for any awards at the end of the year including graduation distinctions. St. Paul's students are expected to be well rounded, with graduation requirements of three years of math, science, humanities, and a second language as well as a four-term arts requirement and one term in religious studies.

All students are required to participate in sports throughout their entire freshmen and sophomore years and for a combined two terms of their junior and senior years.

Four days a week the whole school gathers in the chapel at 8 am for hymns, prayers, and announcements and begins classes at 8:30. During the winter the daily schedule begins thirty minutes later to account for the dark New Hampshire winter.

The typical St. Paul's student takes five classes each term: math, science, a language, an elective or art class, and a humanities class. Humanities is a combination of English and history classes focusing more on concepts such as community or identity than typical courses that focus on literature and history. The school day lasts from 8:00am to 2:30pm with a free hour for lunch. Classes typically are one hour long, with extra time allotted for labs and presentations. Sports begin at 3:00pm and end between 4:15pm and 5:30pm depending on Varsity, Junior Varsity, and non-competitive levels. After sports, dinner is served from 5:30pm to 7:00pm. 7:30pm to 9:00pm is referred to as study hour, but many groups such as choir, band, and interest groups have meetings during this time so this time is mostly unstructured. Check-in times vary with age; 9<sup>th</sup> graders must be in the dorm by 9:00pm, 9:30pm for 10<sup>th</sup> and 11<sup>th</sup> graders, and 10:00pm for 12<sup>th</sup> graders. After check-in, students must stay in their dormitories but do not have to be in their rooms. Time after check-in is usually spent finishing homework and spending time with friends in the dormitory. There is no lights out time, but the Internet shuts off at 12:00am.

There are nine boys dorms and nine girls dorms, which are not divided by grade and usually house between thirty and forty students each. Each dormitory has faculty advisors who live in homes attached to the dorm and are responsible for the students

residing in it. In addition, each dorm has several senior prefects who help oversee the younger students.

**3.4.1. Two different environments:**

In summary, research was conducted within two fairly different environments (see table 3).

**Table 3. School Profile**

|               | <b>St. Paul’s School</b>  | <b>Institute of Collaborative Education</b>  |
|---------------|---|--|
| Location      | Concord, New Hampshire  | Downtown Manhattan   |
| Type          | Private boarding (episcopal)  | Public Day school  |
| Founded       | 1856  | 1995   |
| Students      | 540   | 486  |
| Faculty       | 110   | 90   |
| Daily routine | <ul style="list-style-type: none"> <li>• Four days a week the whole school gathers in the chapel at 8 am for hymns, prayers, and announcements and begins classes at 8:30</li> <li>• The school day lasts from 8am to 2:30pm with an hour for lunch</li> <li>• Classes are typically one hour long</li> <li>• Sports begin at 3pm and end between 4:15 and 5:30pm depending on level</li> <li>• Students must check into their dorm between 9 and 10 pm based on age</li> </ul> | <ul style="list-style-type: none"> <li>• The typical ICE student takes a thirty-minute subway ride to school, and attends their first class at 8:30 in the morning</li> <li>• Once in school, they move with the same group of less than twenty students to and from each class</li> <li>• Advisory, otherwise known as homeroom in other schools, is a semi-weekly class presented to the entire school to socialize and/or study</li> <li>• Students of both the middle and high school are given the same hour lunch period when they are permitted to leave the school to buy lunch</li> </ul> |

To a large degree, both schools exhibit distinct student profiles (see table 4).

**Table 4. Student Profiles**

|                 | <b>St. Paul’s School</b>   | <b>Institute of Collaborative Education</b>  |
|-----------------|--|--|
| Student Profile | <ul style="list-style-type: none"> <li>• SPS students are independent, well rounded individuals who are self motivated</li> <li>• Students must apply to be accepted to SPS so there is a high standard academically</li> <li>• The school’s philosophy <i>Freedom with Responsibility</i> gives students freedom while expecting students not to abuse that freedom, some issues that stem from this philosophy are</li> <li>• Grey areas in student discipline</li> <li>• New and unmotivated students can fall behind academically as a result of so much free time</li> <li>• St. Paul’s humanities curriculum (a combination of English and history) is unorthodox and changes from year to year</li> </ul> | <ul style="list-style-type: none"> <li>• ICE students are creative, diplomatic and well-expressed individuals that encourage debate and discussion on a variety of topics</li> <li>• However, ICE students have specific difficulties that are a product of the school’s philosophy</li> <li>• Commonly lack the ability to focus due to the relaxed class environment</li> <li>• Their difficulties also include memorization, specifically in regards to studying, as well as “shutting down”</li> <li>• Similarly, students commonly feel that they are lacking vocabulary and basic grammar skills</li> <li>• Although taught to write <i>expressively</i>, ICE teachers do not teach students all the skills to write <i>correctly</i></li> <li>• The philosophy of the school remains that it is more important that the student is given the skills to say something meaningful, than to say something grammatically correct</li> </ul> |

In addition, both environments exhibit different philosophies vis-à-vis the use of technology (see table 5).

**Table 5. Approaches to technology usage**

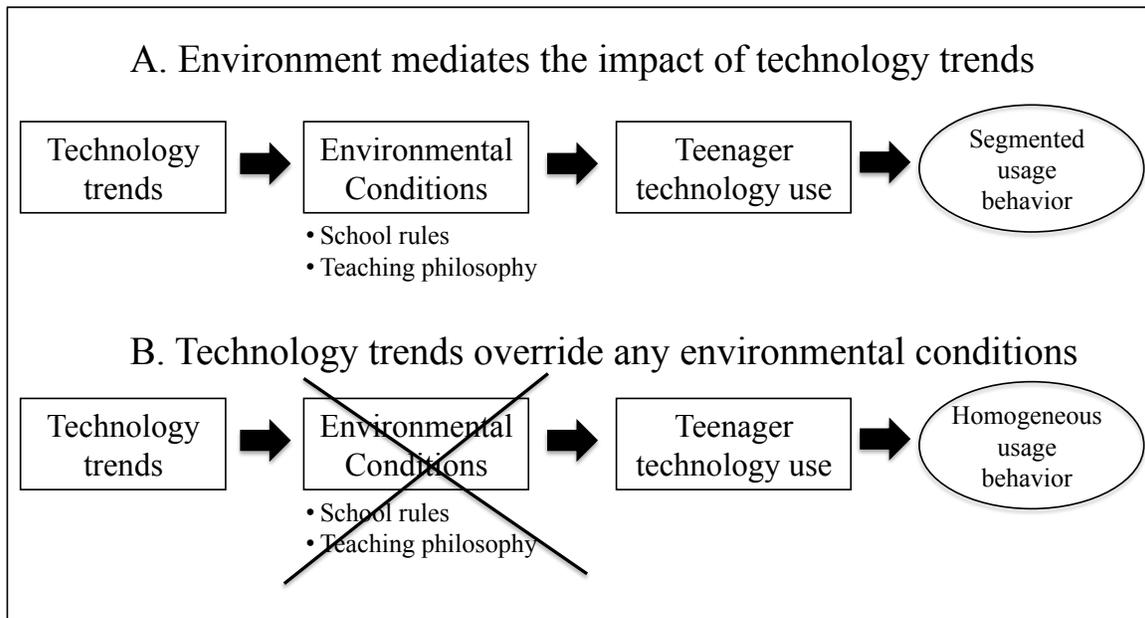
|                               | St. Paul's School   | Institute of Collaborative Education  |
|-------------------------------|---|---|
| <b>Philosophy</b>             | <ul style="list-style-type: none"> <li>• Classes in languages, math, and science are based on ability rather than age, with the exception of humanities, which is done by grade</li> <li>• While St. Paul's is only five minutes away from Concord, NH, students mainly make use of the resources at St. Paul's rather than go into town</li> </ul>   | <ul style="list-style-type: none"> <li>• ICE focuses on every student's creative ability, as opposed to their testing or studying skills</li> <li>• Students are taught to think outside the box and extend their mind to prioritize, multitask, observe and create</li> <li>• Teachers encourage group and project-based work and reliance on Manhattan's urban environment</li> </ul>   |
| <b>Approach to technology</b> | <ul style="list-style-type: none"> <li>• Laptops are not required</li> <li>• Laptops are allowed in some classes but are not needed, and most students do not bring them to their classes</li> <li>• Technology is not frequently used in the classroom; most of the teaching is done traditionally with blackboards and textbooks</li> <li>• Cell phones are discouraged. Students are not allowed to use them during class and are not supposed to use them between classes either</li> <li>• While no policies on TV viewing, most students do not watch on a day-to-day basis. The only televisions accessible to students are in common areas so they are only used for group activities such as watching sports or movies.</li> </ul> | <ul style="list-style-type: none"> <li>• Projects demand intense use of the Internet</li> <li>• Students commonly text message throughout their classes, access Facebook and other applications via their smartphones or laptops brought to class</li> <li>• Most teachers allow cell phone and computer use through lectures, discussions and study hall periods</li> <li>• Lunch is a social hour where many students will continue to bring out their laptops at the local grocery or diner</li> </ul> |

**3.2. Hypotheses and Methodology:**

These almost polar depictions of the two school environments present an interesting research question. Does the environment shape teenage behavior when it comes to technology, or does technology represent a behavioral constraint so strong that it can override any differences existing within each school? In other words, is technology usage among teenagers being shaped by the schools' disparate teaching philosophies and

cultures, resulting in distinct behavior by each group of students? Or is the influence of technology so strong that it acts as a homogenizing factor, overriding any intentional differences driven by the school’s culture? (See figure 2)

**Figure 2. Two alternative hypotheses**



Along these lines, how are teenagers reacting to the accelerated social deployment of information technologies? Do they undergo a process of substitution (e.g. print by digital products, linear TV by over the top video streaming) or is consumption of information technology guided by a principle of complementarity (in other words, intense reading would be correlated with intense internet use)? Related to the prior hypothesis, can we detect different substitution versus complementarity effects determined by the school culture? Similarly, can we detect different social network behavior across either socio-demographic segments or school cultures?

A free response survey that typically took twenty minutes to complete was developed (see survey in appendix). The survey asked the subject to explain technologies being

used, their frequency of use, and the pattern of utilization. Users were also asked to specify the amount of time they spend using technologies throughout their typical day:

- What kind of technology tools do you own?
- How do you use technology throughout a school day versus during the weekend?
- How do you use Facebook? How many of your “Facebook friends” are “real friends”?
- How do you pay for the technology you use and own?
- How much time do you spend on each technology?
- How do you watch television: streaming versus live?
- What are the most common sites and applications you access?

The purpose of the study was to understand the subject’s routine as well as the role technology played in each part of his day. Averages and percentages were calculated to compare the technology use between students of St. Paul’s and ICE as well as by gender, age, and socioeconomic grouping.

### 3.3. Survey responses:

Data collection yielded 165 completed surveys. They comprised 155 high school students and 10 middle school ones (only for ICE). Female responses were higher than male (see table 6).

**Table 6: Survey Responses by Gender**

| Gender | SPS   |            | ICE   |            | Total |            |
|--------|-------|------------|-------|------------|-------|------------|
|        | Total | Percentage | Total | Percentage | Total | Percentage |
| Male   | 36    | 37.11 %    | 21    | 36.21 %    | 57    | 36.77 %    |
| Female | 61    | 62.89 %    | 37    | 63.79 %    | 98    | 63.23 %    |
| Total  | 97    |            | 58    |            | 155   |            |

On the other hand, the grade of respondents was equally represented across schools in the 9-11 cohort (see table 7).

**Table 7: Survey Responses by Grade**

| Grade | SPS   |            | ICE   |            | Total |            |
|-------|-------|------------|-------|------------|-------|------------|
|       | Total | Percentage | Total | Percentage | Total | Percentage |
| 7-8   | -     | -          | 10    | 20.83 %    | 10    | 6.4 %      |
| 9     | 27    | 27.84 %    | 19    | 39.58 %    | 46    | 29.7 %     |
| 10    | 21    | 21.65 %    | 19    | 39.58 %    | 40    | 25.8 %     |
| 11    | 25    | 25.77 %    | 10    | 20.83 %    | 35    | 22.6 %     |
| 12    | 24    | 24.74 %    | -     | -          | 24    | 15.5 %     |
| Total | 97    |            | 58    |            | 155   |            |

Finally, 96.5 % of respondents were between the ages of 14 and 18 (see table 8).

**Table 8: Survey Responses by Age (High School Only)**

| Age   | SPS   |            | ICE   |            | Total |            |
|-------|-------|------------|-------|------------|-------|------------|
|       | Total | Percentage | Total | Percentage | Total | Percentage |
| 13    | 1     | 1.08%      |       |            | 1     | 0.7 %      |
| 14    | 5     | 5.38%      | 12    | 26.09%     | 17    | 12.1%      |
| 15    | 22    | 23.66%     | 19    | 36.96%     | 41    | 29.1 %     |
| 16    | 26    | 27.96%     | 11    | 23.91%     | 37    | 26.2 %     |
| 17    | 22    | 23.66%     | 6     | 13.04%     | 28    | 19.9 %     |
| 18    | 13    | 13.98%     | -     | -          | 1313  | 9.2 %      |
| 19    | 4     | 4.30%      | -     | -          | 44    | 2.8 %      |
| Total | 93    |            | 48    |            | 141   |            |

## 4. FINDINGS

Responses were analyzed following the roadmap introduced in figure 1.

### 4.1. Use of Technology

#### 4.1.1. Number of Devices:

The differences in technology adoption confirm the environmental impact hypothesis. In other words, the context in which teenagers live results in slightly different technology ownership (see table 9).

**Table 9. Percent of Teenagers that own a technology device**

| Device / Platform | SPS   |            | ICE   |            | Total |            |
|-------------------|-------|------------|-------|------------|-------|------------|
|                   | Total | Percentage | Total | Percentage | Total | Percentage |
| Cellphone         | 89    | 91.4%      | 57    | 98.3%      | 146   | 94.2%      |
| PC                | 96    | 99.1%      | 48    | 82.8%      | 144   | 92.9%      |
| Videogame         | 40    | 44.8%      | 34    | 58.6%      | 74    | 47.7%      |
| Television        | 48    | 55.8%      | 48    | 82.8%      | 96    | 61.9%      |
| Facebook user     | 95    | 97.9%      | 51    | 87.9%      | 146   | 94.2%      |

Cell phones have not only become universal, but they are slowly becoming a necessity for teenagers and adults of all communities, therefore the results are not of any surprise.

The slight increase in ICE ownership in cell phones may be due to the urban community, making it virtually impossible, and unsafe, for a teenager not to own a cellphone.

Similarly, due to their environment, St. Paul’s students require their own individual computer while away at boarding school, whereas ICE students can use computers available at school or share with their family members. More ICE students own televisions in their bedroom (specified in the questionnaire) simply because they are allowed to do so. St. Paul’s students share televisions in common rooms, and are not permitted to have their own television with cable access.

Furthermore, the boarding school schedule does not allow St. Paul’s students much free time, explaining why ICE students are more likely to own game consoles (along with other technologies). Finally, the majority of students in both schools have a Facebook account, although the percentage of St. Paul’s users is slightly higher than ICE, which

could indicate that the social network plays a key role in meeting the socialization needs of boarding school students.

In sum, when it comes to technology use, it would appear that the school environment is shaping device ownership.

#### **4.1.2. Frequency and Intensity of Use:**

How often do teenagers use these devices? Are there patterns of frequency and intensity that can be identified? Or alternatively, do adolescents live in an “always on” context from which they rarely disconnect to conduct other activities, furthering multi-tasking patterns? In that context, are reported patterns providing a glimpse of a decline of time employed in other “non technology-based” knowledge gathering or entertainment activities (e.g. reading books)? Three findings are worth exploring in this regard. First, we will discuss the amount of time (per day and on weekends) that teenagers spend interacting with technology. Second, we will explore the extent to which book reading is being influenced by the time spent interacting with technology platforms. Third, we will present data regarding the use of texting in class (a widely discussed topic in current affairs).

##### ***Frequency of technology use:***

Respondents spend on average 554.80 minutes (or 9.25 hrs.) a day using technology devices during the week. While the data is not strictly comparable, some results are surprisingly different from those findings generated by the Kaiser Foundation study (see table 10).

**Table 10. Minutes spent using technology devices: Kaiser Foundation versus this study (Weekdays)**

| <b>Device/Medium</b> | <b>Kaiser Foundation (2009)</b> | <b>This Study (Week-days) (2012)</b> |
|----------------------|---------------------------------|--------------------------------------|
| Cellphone            | - - -                           | 191.5                                |
| PC                   | 89                              | 279.5 (of which 88 on Facebook)      |
| Videogame            | 73                              | 31.4                                 |
| Television           | 269                             | 52.4                                 |
| Music/Audio          | 151                             | - - -                                |
| Print                | 38                              | - - -                                |
| Movies               | 25                              | - - -                                |
| Total exposure       | 645                             | 554.8                                |

The most noticeable difference is the increase in time in front of a PC and the reduction of time spent watching TV. This finding is most likely the consequence of a shift of the primary video access point from television to the PC, resulting from Over The Top (downloading content from the Internet) applications. In addition, the increase of PC time allocation could be the result of the growing network effects of Facebook, comprising a third of PC connected time, per our results.

In addition, videogame playing in our study is half the number reported in the Kaiser study (73 minutes versus 31.4). Part of this difference could be explained by the fact that the segment of videogame players with highest usage pertains, according to Kaiser, to the lower socio-demographic groups, which are considerably underrepresented in our study. The other driver of reduction in videogame time could result from increasing popularity of PC-based (particularly social networks-based such as Zynga) gaming.

Although the Kaiser study does not measure cellphone utilization, one could assume that a portion of its reported media consumption takes place on the cellphone. Nevertheless, our study clearly points out that the two prevalent access points to communications, information and entertainment for teenagers are the cellphone and the PC.

Our study also identifies some differences in usage patterns across schools and genders, which again confirm the environmental impact hypothesis (see table 11).

**Table 11. Minutes spent using technology devices (Weekdays)**

| Device              | SPS   |       |         | ICE   |       |         | Total |       |         |
|---------------------|-------|-------|---------|-------|-------|---------|-------|-------|---------|
|                     | Boys  | Girls | Average | Boys  | Girls | Average | Boys  | Girls | Average |
| Cellphone           | 127.2 | 170.8 | 157     | 239.6 | 262.9 | 254.43  | 167.7 | 204.1 | 191.5   |
| PC                  | 275.3 | 283.4 | 280.6   | 271.7 | 280.7 | 277.22  | 274   | 282.4 | 279.5   |
| (Of which Facebook) | 80.3  | 89.0  | 85.97   | 90.33 | 92.06 | 91.51   | 83.9  | 90.1  | 88.0    |
| Videogame           | 50    | 7.4   | 24.4    | 99.3  | 20.5  | 49.04   | 67.7  | 12.1  | 31.4    |
| Television          | 53.1  | 13.8  | 27.6    | 116.3 | 86.0  | 96.5    | 75.9  | 39.9  | 52.4    |
| Total exposure      | 505.6 | 475.4 | 489.6   | 726.9 | 650.1 | 677.19  | 585.3 | 538.5 | 554.8   |

Note: Facebook is included within PC time

|  |                       |  |                         |
|--|-----------------------|--|-------------------------|
|  | Similar usage pattern |  | Different usage pattern |
|--|-----------------------|--|-------------------------|

ICE students on average use all technologies more frequently than St. Paul’s students do.

This is most likely a direct consequence of the school’s approach to technology usage of intense embedding of platforms in the teaching experience, augmented by the pressure of the urban context. In fact, the primary driver of usage intensity between St. Paul’s and ICE students is the cellphone. Secondary drivers of ICE’s usage intensity are television viewing and videogame playing. On the other hand, PC usage (280.6 minutes at St. Paul’s and 277.22 at ICE) and Facebook connectivity (85.97 minutes at St. Paul’s and 91.51 at ICE) are similar across students in both schools.

How about gender differences? Girls in both schools spend less time interacting with technology than boys. This difference in frequency is driven by a completely different usage pattern. While girls use both their cellphones and PCs more (in both schools), they compensate that by playing videogames and watching TV less. Facebook connectivity is fairly homogeneous across genders and schools.

As a result, differences in frequency of technology usage are driven by a combination of school culture and gender, although social networking and PC usage remain fairly homogeneous across segments.

Frequency and allocation of time changes, as expected, during weekends only for the technologies where data was captured (see table 12).

**Table 12. Minutes spent using technology devices (Week-ends)**

| Device                | SPS   |       |         | ICE   |       |         | Total |       |         |
|-----------------------|-------|-------|---------|-------|-------|---------|-------|-------|---------|
|                       | Boys  | Girls | Average | Boys  | Girls | Average | Boys  | Girls | Average |
| PC                    | 307   | 336.6 | 325.8   | 363.3 | 364.7 | 364.3   | 321.1 | 344.7 | 336.4   |
| Television            | 103.2 | 100.7 | 101.1   | 205.0 | 270.0 | 251.9   | 139.8 | 161.9 | 154.3   |
| Facebook <sup>3</sup> | 80.3  | 89.0  | 85.97   | 90.33 | 92.06 | 91.51   | 83.9  | 90.1  | 88      |

Total exposure to television and PC jumps on weekends, as expected. However, ICE students watch more than twice the amount of television than St. Paul’s students do, and marginally use their computers more. Girls at ICE tend to watch more television than boys on weekends.

***Technology Usage by Time of Day***

Another perspective of technology usage pattern can be gathered through a time of day analysis. Responses to the survey enabled a breaking down of technology use by time of day. For this purpose, four periods were defined:

- Before School: Time from waking up until first morning class
- During School: Once first morning class begins, through lunch, until last class is dismissed
- After School: After last class is dismissed, when home and completing homework, up until dinner

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<sup>3</sup> No difference was made in the survey for weekday and weekend access to Facebook.

- Evening: The beginning of dinner until the bed time

ICE students were able to respond to this question for the four periods, while St. Paul’s students responded for two periods: during school and after school. The results are presented in tables 13 and 14.

**Table 13. Average Time Spent by Technology: ICE High School (week-days) (in minutes)**

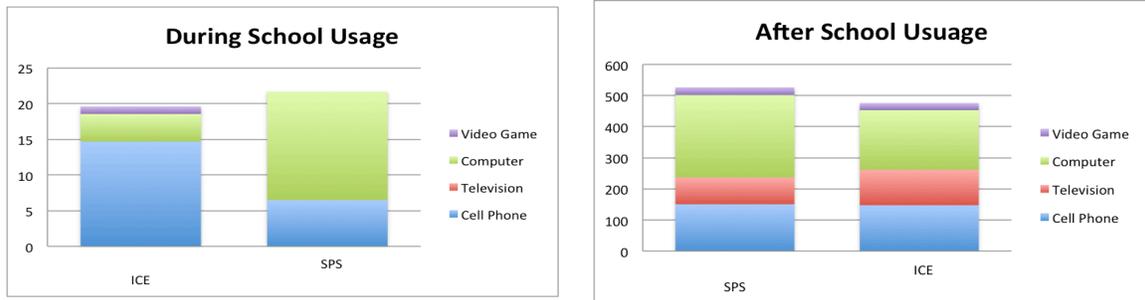
|                | <b>Before School</b> | <b>During School</b> | <b>After School</b> | <b>Evening</b> | <b>Total</b> |
|----------------|----------------------|----------------------|---------------------|----------------|--------------|
| Cell Phone     | 31.96                | 14.7                 | 147.4               | 60.37          | 254.43       |
| Television     | 10.17                | 0                    | 113.94              | 74.51          | 198.62       |
| Computer       | 13.5                 | 3.87                 | 191.8               | 68.05          | 277.22       |
| Video-games    | 2.39                 | 1.05                 | 22.98               | 22.62          | 49.04        |
| Total Exposure | 58.02                | 19.63                | 476.15              | 226.61         | 780.38       |

**Table 14. Average Time Spent by Technology: St. Paul’s (week-days) (in minutes)**

|                | <b>Before School</b> | <b>During School</b> | <b>After School</b> | <b>Evening</b> | <b>Total</b> |
|----------------|----------------------|----------------------|---------------------|----------------|--------------|
| Cell Phone     | ---                  | 6.5                  | 150.5               | ---            | ---          |
| Television     | ---                  | 0                    | 86                  | ---            | ---          |
| Computer       | ---                  | 15.2                 | 265.4               | ---            | ---          |
| Video-games    | ---                  | 0                    | 24.4                | ---            | ---          |
| Total Exposure | ---                  | 21.7                 | 526.3               | ---            | ---          |

When comparing time of day usage, technology exposure throughout the day is also quite different (see figure 3).

**Figure 3.**



At ICE, after school time is somewhat shared between PC usage and television watching (probably in a multi-tasking mode). At St. Paul’s, television watching comprises less of the after school time, though PC usage comprises more. This probably indicates that, despite the existence of televisions in common areas at St. Paul’s, students prefer PCs since the device allows for more individual choice of content.

***Book reading:***

A widely reported trend in the research literature on technology impact has been the decline in leisure book reading on the part of teenagers. While the survey does not provide an understanding of the trend, it gives a glimpse into the amount of books read by adolescents at this point in time (see table 15).

**Table 15. Number of books read**

|       | SPS | ICE  | Total |
|-------|-----|------|-------|
| Boys  | 2.9 | 6.3  | 3.9   |
| Girls | 3.6 | 12.9 | 6.6   |
| Total | 3.4 | 10.7 | 5.6   |

Teenagers read for leisure an average of 5.6 books per year. Girls tend to read more than boys (6.6 vs. 3.9). This could be partly explained by a substitution effect with videogame playing since boys are the primary users of video games.

ICE students read significantly more than St. Paul’s students (10.7 books versus 3.4). This could mean that, *prima facie*, boarding school schedules negatively affect leisure reading. In addition, several dynamics might be at work in this regard. For example, ICE students need to travel to and from school every day, where as St. Paul’s students only travel from their room to each class. The subway, bus, or car ride gives each ICE student anywhere from 20 minutes to an hour of extra time for reading, playing portable video games, using their cell phones, etc. In this case, however, many students need to take theft into consideration, and in doing so, it is more likely that ICE students engage in reading books as opposed to using expensive electronics.

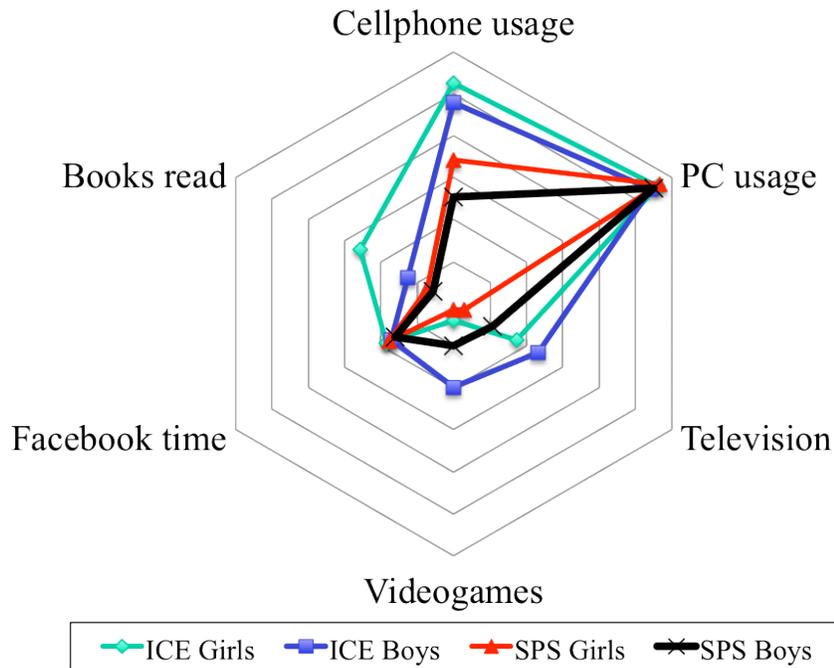
In addition to this contextually driven difference, an intriguing pattern emerges (see table 16).

**Table 16. Book reading versus technology usage**

|                        | Highest                  | Medium-High              | Medium-Low               | Lowest                  |
|------------------------|--------------------------|--------------------------|--------------------------|-------------------------|
| <b>Cellphone usage</b> | <b>ICE girls</b> (262.9) | <b>ICE boys</b> (239.6)  | <b>SPS girls</b> (170.8) | <b>SPS boys</b> (127.2) |
| <b>PC usage</b>        | <b>SPS girls</b> (283.4) | <b>ICE girls</b> (280.7) | <b>SPS boys</b> (275.3)  | <b>ICE boys</b> (271.7) |
| <b>Television</b>      | <b>ICE boys</b> (116.3)  | <b>ICE girls</b> (86)    | <b>SPS boys</b> (53.1)   | <b>SPS girls</b> (13.9) |
| <b>Videogames</b>      | <b>ICE boys</b> (99.3)   | <b>SPS boys</b> (50)     | <b>ICE girls</b> (20.5)  | <b>SPS girls</b> (7.4)  |
| <b>Facebook time</b>   | <b>ICE girls</b> (92.6)  | <b>ICE boys</b> (85.97)  | <b>SPS girls</b> (89.0)  | <b>SPS boys</b> (80.3)  |
| <b>Books read</b>      | <b>ICE girls</b> (12.9)  | <b>ICE boys</b> (6.3)    | <b>SPS girls</b> (3.6)   | <b>SPS boys</b> (2.9)   |

The same data has been plotted graphically to depict the differences (see figure 4).

**Figure 4. Comparative Cumulative Media and technology Usage**



According to the data, out-of-class reading is correlated with media and technology exposure. ICE students systematically score higher in terms of both interactions with digital devices and book reading (the only area where St. Paul's girls score highest is in terms of PC usage, except that the range between highest and lowest is fairly small). This finding would support two of the three hypotheses raised above. First, the school culture (public day versus private boarding) and the geographic context (city versus semi-rural area) are two factors driving specific behavioral patterns vis-à-vis technology usage. A school culture that incorporates technology into its curriculum and defines rules that encourage rather than prevent technology usage, combined with an urban context, might result in a stimulating environment for knowledge acquisition in all its manifestations. Second, a complementarity pattern appears to exist, whereby if teens are intense users of

digital technology, they will remain frequent book readers. This would support the original media cumulative impact hypothesis.

On the other hand, substitution between technologies should not be discarded. Television and videogames exhibit high time allocation for boys, who also depict lower time for PC time. Girls exhibit exactly the inverse pattern (with the exception of ICE girls television viewing patterns).

***Texting in class***

Overall 36% of teenagers report that they text in class. The proportion is significantly higher (48%) at ICE than St. Paul’s, partly due to the “no cellphone” policy imposed at the latter school (see table 17).

**Table 17. Texting in class**

|     | <b>Boys</b> | <b>Girls</b> | <b>Average</b> |
|-----|-------------|--------------|----------------|
| SPS | 27.78%      | 30.00%       | 29.17%         |
| ICE | 47.62%      | 48.65%       | 48.28%         |
|     |             |              | 36.36%         |

On average students report sending 10.8 texts per class (see table 18).

**Table 18. Average volume of texts per class**

|     | <b>Boys</b> | <b>Girls</b> | <b>Average</b> |
|-----|-------------|--------------|----------------|
| SPS | 8.3         | 8.9          | 8.7            |
| ICE | 14.1        | 14.5         | 14.3           |
|     |             |              | 10.8           |

Even in a school where cellphones are not allowed, texting remains significant. Based on the findings of the research regarding multi-tasking reviewed above, the intensity of texting in class should be a matter of concern when it comes to the quality of the learning experience.

## 4.2. Purpose of Use:

While self-reported, the information collected in the survey responses provide a glimpse into the purpose and functions supported by technology platforms used by adolescents. There are two aspects that are particularly interesting in this regard: first, teenagers' choice of communication platforms (in other words, what type of platform is utilized to communicate with whom and is the content of the communication and context guiding the choice of technology) and second, the function fulfilled by teenager utilization of social networks (as an example, solidify pre-existing relationships, make new acquaintances, or get information about people that are not real "friends").

### 4.2.1. Choice of Communication Platform

A widely reported trend in the research literature is that of students' preference to texting over placing voice calls. This is confirmed in our survey: 69% of students text more than they call (see table 19).

**Table 19. Percent of Students that text more than calling**

|     | <b>Boys</b> | <b>Girls</b> | <b>Average</b> |
|-----|-------------|--------------|----------------|
| SPS | 50%         | 73.33%       | 64.95%         |
| ICE | 71.43%      | 83.33%       | 77.66%         |
|     |             |              | 69.10%         |

Participants of the study noted that the people *to whom* they are talking dictates whether they text or call. Participants are aware of the preferences of their friends and families and abide by them. "I ask them if they want me to call or text them," one student commented. The most popular response was captured in one participant's response, "If it is urgent, I will call. If it can wait or is not as important, I will text."

### 4.2.2. Social network usage

Social networks are sites that allow users to negotiate presentations of self and connect with others. The public displays of connections serve as identity signals (degree of “popularity”). Research of the networking that occurs via social networks indicates that links generally tend to occur between “latent ties” that share some off-line connection. In that sense, the social network primarily supports pre-existing social relationships. However, research done by Pikorski (2009) also identified a second social purpose met by networks, whereby the network serves as a way of providing visibility on strangers’ behaviors or as a tool to kick-start linkages. The following section provides a glimpse on teenager behavior when it comes to social network usage, both in terms of the platform function of reinforcing pre-existing ties as well as behavior when connected to the network.

***Number of friends***

Lampe (2008) found in his research of Facebook behavior among college students that the average total number of “friends” had increased from 338 in 2006 to 441 in 2008. We asked high school students how many Facebook friends they have and how many of those friends they consider to be real friends (see table 20).

**Table 20. Total Number of Friends**

|                    | <b>Total Friends</b> | <b>Real Friends</b> | <b>% Real Friends</b> |
|--------------------|----------------------|---------------------|-----------------------|
| St. Paul’s Average | 928                  | 233.6               | 25.2%                 |
| St. Paul’s Boys    | 794.7                | 189.1               | 23.8%                 |
| St. Paul’s Girls   | 994.7                | 256.7               | 25.8%                 |
| ICE Average        | 455.2                | 172.9               | 38%                   |
| ICE Boys           | 527.1                | 215.3               | 40.8%                 |
| ICE Girls          | 419.3                | 153.1               | 36.5%                 |
| Total Average      | 756.1                | 212.0               | 28%                   |

While St. Paul’s students have, on average, more Facebook “friends” than ICE students (928 versus 455), ICE students on average have more “real” friends (25.2% at St. Paul’s

versus 38% at ICE). The ratio is fairly similar for boys as for girls at both schools, which could mean that the type of school affects the different patterns.

Because St. Paul’s is a larger school, students are naturally bound to have more Facebook friends. Similarly, because ICE is a smaller school, the students are going to have more “real friends” represented on their Facebook accounts. The numbers represented highlight differences between a boarding school and a public day school.

***Facebook Time Allocation***

In the research mentioned above, Lampe (2008) determined that 79% of college students spend 15 minutes per day on Facebook, while 9% spend over 2 hrs. Our research indicates that, on average, teens self-report spending close to two hours a day on Facebook (see table 21).

**Table 21. Time Spent on Facebook (minutes per day)**

|         | <b>St. Paul’s</b> | <b>ICE</b> | <b>Average</b> |
|---------|-------------------|------------|----------------|
| Boys    | 80.3              | 90.3       | 83.6           |
| Girls   | 89                | 92.1       | 90.1           |
| Average | 86                | 91.5       | 87.9           |

The distribution of time spent on Facebook would appear to indicate that 60% of teenagers spend one hour or less, while 39.8% spend between one and two hours<sup>4</sup> (this should be considered as time interacting with the platform) (see table 22).

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<sup>4</sup> We consider the 27 responses stating more than 160 minutes as being misinterpreted answers, which based the estimate as time the platform was open on the screen although the user was not necessarily interacting with it.

**Table 22. Distribution of Time Spent on Facebook (minutes per day)**

|            | <20   | 21-40 | 41-60 | 61-80 | 81-100 | 101-120 | 121-140 | 141-160 | >161  |
|------------|-------|-------|-------|-------|--------|---------|---------|---------|-------|
| Total      | 38    | 14    | 28    | 2     | 6      | 18      | 0       | 0       | 27    |
| Percentage | 28.6% | 10.5% | 21.1% | 1.5%  | 4.5%   | 13.5%   | 0%      | 0%      | 20.3% |

What do teens do while on Facebook? The questionnaire allows calculating a self-reported estimate of time allocation on Facebook (see table 23).

**Table 23. Facebook Time Allocation**

|                    | Watching Friends' Pages | Inputting Information in own page | Watching pages of people not close to | Writing on other people's walls, chatting | Total |
|--------------------|-------------------------|-----------------------------------|---------------------------------------|---|-------|
| St. Paul's Average | 36.3 (29%)              | 13.6 (11%)                        | 16.5 (13%)                            | 58.3 (47%)                                | 124.7 |
| St. Paul's Boys    | 26.3 (31%)              | 13.3 (16%)                        | 9 (10%)                               | 36.6 (43%)                                | 85.2  |
| St. Paul's Girls   | 42.5 (29%)              | 13.8 (9%)                         | 24 (16%)                              | 67.7 (46%)                                | 148   |
| ICE Average        | 21.8 (22%)              | 20 (20%)                          | 15.6 (16%)                            | 42.2 (42%)                                | 99.6  |
| ICE Boys           | 13.7 (15%)              | 18.1 (19%)                        | 19.2 (21%)                            | 42.5 (45%)                                | 93.5  |
| ICE Girls          | 26 (25%)                | 21 (21%)                          | 13.8 (13%)                            | 42.1 (41%)                                | 102.9 |
| Total Average      | 30.9 (27%)              | 16.3 (14%)                        | 15.8 (14%)                            | 51.8 (45%)                                | 114.8 |

This time allocation can be compared with the results reported by Piskorski (2009) in his research of the general population of a social networking site (see table 24).

**Table 24. Social Network comparative time allocation**

|                            | Piskorski (2008) | This Study | St. Paul's | ICE  |
|----------------------------|------------------|------------|------------|------|
| View Profiles of Friends   | 35 %             | 27 %       | 29 %       | 22 % |
| View Profiles of Strangers | 35 %             | 14 %       | 13 %       | 16 % |
| View own profile           | 9 %              | 14 %       | 11 %       | 20 % |
| Add or delete friends      | 8 %              |            |            |      |
| Add content to Profile     | 8 %              |            |            |      |
| Email, chat                | 5 %              | 45 %       | 47 %       | 42 % |

While considering that Piskorski's data is based on monitoring clicks of 320,000 users and our data is based on self-reporting metrics, the differences in time allocation are significant:

- Teenagers appear to be less prone than the general population to view pages of strangers or people to whom they are not close (we recognize that a bias could exist in self-reporting an activity that is not socially acceptable). This could mean that the concept of “network as covers” developed by Piskorski, according to which social networks provide a cover allowing actors to engage in activities other than “keeping up with friends” (e.g. search for romantic partners) might not be applicable to teenagers. This finding is consistent with research among university students that indicates that their primary behavior is focused on searching for people with whom they have an offline connection rather than “browse” for strangers
- Teenagers are more likely to rely on the social network for communication purposes. This trend reveals a shift in both attitudes and positioning of social networks from conventional networking sites to communications utilities. This difference between teenagers and adults in utilization of social networks for one-to-one communications (versus conventional email platforms) has also been identified in prior research.

Another significant finding to report is that boys at the ICE School spend a significantly higher percentage of their time Facebook stalking (21%) than do the boys at St. Paul's School (10%) (see table 25).

**Table 25. Minutes Spent Watching Profiles of Strangers**

|     | <b>Boys</b> | <b>Girls</b> | <b>Average</b> |
|-----|-------------|--------------|----------------|
| SPS | 9 (10%)     | 24 (16%)     | 16.5 (13%)     |
| ICE | 19.2 (21%)  | 13.8 (13%)   | 15.6 (16%)     |
|     |             |              | 15.8 (14%)     |

One explanation of this difference could be that the boys at St. Paul’s have, on average, many more friends on Facebook (794.7) than those at the ICE School (527.1). Therefore what boys at ICE might qualify as “stalking,” boys at St. Paul’s would simply refer to as “keeping up with friends” because they have a much larger Facebook friend base. The combined time for these two categories is very similar between both groups; the boys at St. Paul’s on average spend a combined 35.3 minutes a day in these two activities while the boys at the ICE School spend a combined 32.9 minutes. In sum, while both groups spend comparable amounts of time watching other people’s pages, they might have different definitions for what constitutes friendship and what they would consider stalking.

### **4.3. Patterns of Consumption**

#### ***4.3.1. Internet Streaming vs. Linear Television***

We surveyed the ways in which high school students watch videos as Internet streaming becomes more popular (see table 26).

**Table 26. Percentage of Respondents that stream more than watch linear TV**

|     | <b>Boys</b> | <b>Girls</b> | <b>Average</b> |
|-----|-------------|--------------|----------------|
| SPS | 68.6%       | 82.8%        | 77.4%          |
| ICE | 41.7%       | 52.4%        | 48.5%          |
|     |             |              | 69.8%          |

Seventy percent of high school students stream from the Internet more than they watch television. Two apparent trends are that within the same school, girls stream more videos than the boys and that St. Paul's students stream more than ICE students. One possible explanation for the gender-based difference is that girls and boys watch different programs. Boys typically watch more sports than girls do: 42.9% more in St. Paul's case and at the ICE School, none of the girls surveyed watch sports programs. Netflix and Hulu are designed for watching television series and movies, not for streaming live sports. While it is possible to watch sports games live at Hulu Plus, we expect that most male students would prefer to watch sports live on television with other friends rather than pay for Hulu Plus and watch it by themselves. For girls, Netflix and Hulu work perfectly with their preferences because TV programs are often on live television at less reliable and convenient times that may interfere with homework or other activities. Therefore, it is far more convenient to catch up on lengthy television series via online services at their own pace and without commercials.

The gap between the streaming tendencies of St. Paul's students and ICE students results from the differences between boarding and city schools. As a boarding school, St. Paul's does not allow its students to have their own televisions; therefore they must rely on the televisions in the common areas of the school. Because there is a lack of accessibility and convenience for watching television, the students at St. Paul's tend to watch it online more than those students at ICE.

#### **4. CONCLUSION**

Table 27 provides a summary of all findings

**Table 27. Study Conclusions**

| <b>Research Domain</b> | <b>Sub-domain</b>                   |                        | <b>Finding</b>   |
|------------------------|-------------------------------------|------------------------|--|
| Use of Technology      | Number of devices/Frequency of use  |                        | <ul style="list-style-type: none"> <li>• The majority of SPS students own computers (99%), compared to the 82% of ICE students.</li> <li>• The majority of ICE students own cellphones (98%), a television (82%) and are users of Facebook (87%).</li> <li>• The two most popular technologies used by participants were Facebook and cellphones.</li> </ul> |
|                        | Purpose of use/Choice of Technology | Communication platform | <ul style="list-style-type: none"> <li>• Participants spend most time on Facebook communicating with friends as opposed to “stalking”, playing games, or uploading material.</li> </ul>  |
|                        |                                     | Video consumption      | <ul style="list-style-type: none"> <li>• SPS students stream more television than ICE students. 70% of the participants stream over watching live television.</li> <li>• ESPN and ABC were the most popular channels watched live by students.</li> </ul>  |
|                        |                                     | Complementarity        | <ul style="list-style-type: none"> <li>• Students with computers spend more time on Facebook.</li> </ul>   |
|                        | Patterns of consumption             |                        | <ul style="list-style-type: none"> <li>• Participants prefer texting to calling (64% SPS and 77% ICE).</li> <li>• Students who spend more time on Facebook read fewer books.</li> </ul>  |
| Segmentation           | Urban vs. Prep-school               |                        | <ul style="list-style-type: none"> <li>• SPS students on average have more Facebook friends than ICE students, however their percentage of real friends is less.</li> <li>• SPS students in general use Facebook more than ICE students.</li> </ul>  |
|                        | Males vs. females                   |                        | <ul style="list-style-type: none"> <li>• Females read more than males (12.9 compared to 6.3 within the ICE community).</li> <li>• On average females spend more time on Facebook than males.</li> </ul>  |
|                        | Socio-economic                      |                        | <ul style="list-style-type: none"> <li>• The socio economics of an individual doesn’t allow or refuse access to technology.</li> <li>• Technology is considered a necessity and is therefore widely distributed throughout with the exception of the lowest socio-economic demographic segments</li> </ul>   |

At a high level, the study has validated to a large extent the hypotheses raised.

First, contrary to the presumed homogenization of information goods consumption and communication patterns, the adoption and patterns of use of information technology are shaped by the individuals' residing environment and context. Evidence indicates that school culture (public day versus private boarding) and the geographic context (city versus semi-rural) are two factors driving specific behavioral patterns vis-à-vis technology usage.

Second, contrary to prevalent notions that indicate a substitution between information technologies (e.g. print by digital products, linear TV by over the top video streaming), consumption of information goods appears to be guided by a principle of complementarity. A complementarity pattern appears to exist; if teens are intense users of digital technology, they will remain frequent book readers. However, substitution between technologies should not be discarded. Boys tend to spend much more time watching television and playing videogames than they do using PCs. Girls exhibit exactly the inverse pattern.

In this context, a school culture that a) incorporates technology into its curriculum, and b) defines rules that encourage rather than prevent technology usage - particularly in an urban context - might create a stimulating environment for knowledge acquisition in all its manifestations. On the other hand, technology adoption without controls could negatively impact the teaching experience (negative impact of text in classroom).

Thirdly, while social networks tend to address social needs (or so-called "failures"), their usage, even within highly segmented socio-demographic categories, tend to be highly group specific. Teenagers appear to be less prone than the general population to view pages of strangers or people to whom they are not close. We recognize that a bias could

exist in self-reporting an activity that is not socially acceptable. As a result, the concept of “network as covers,” or the idea that social networks provide a cover allowing actors to engage in activities other than “keeping up with friends,” might not apply to teenagers. This finding is consistent with research on university students that indicates that their primary behavior is focused on searching for people with whom they have an offline connection rather than “browse” for strangers. Teenagers are more prone to rely on the social network for communication purposes. This trend reveals a shift in both attitudes and the positioning of social networks from conventional networking sites to communications utilities.

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## APPENDIX: SURVEY QUESTIONNAIRE

**HELLO! THE PURPOSE OF THIS QUESTIONNAIRE IS TO UNDERSTAND HOW WE USE TECHNOLOGY (CELLPHONES, COMPUTERS, VIDEOGAMES, ETC.) IN OUR LIVES. FILLING IT OUT WILL NOT TAKE YOU MORE THAN FIFTEEN MINUTES. TO FILL IT OUT WE WOULD ASK YOU TO THINK ABOUT YOUR USE OF TECHNOLOGY IN TYPICAL WEEK-DAY AND WEEK-END**

### **1. LET US FIRST UNDERSTAND WHAT KIND OF TECHNOLOGY TOOLS YOU OWN (we mean that are yours, or that is in your room rather than in a family room):**

- a. Cellphone:                      Yes          No          What Brand and Model:
- b. Laptop computer:              Yes          No          What Brand and Model:
- c. Videogame console:          Yes          No          What Brand and Model:
- d. TV set:                              Yes          No          What Brand and Model:
- e. DVD Player:                      Yes          No          What Brand and Model:
- f. Other (eReader, tablet) Yes          No          What Brand and Model:

### **2. LET US START THINKING ABOUT YOUR TYPICAL WEEK-DAY. THINK ABOUT THE WAYS YOU USE TECHNOLOGY DURING THE WHOLE DAY (for example, what do you do between the time that you wake up and you get to school):**

**a. Between the time you wake up and you leave home to go to school**

- Technologies you use (circle all that apply)  
Cell phone  
Television  
Laptop/Computer  
Video Game
- Minutes spent by technology: \_\_\_\_\_
- Apps you access: (please list)

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- TV Programs you watch: (please list)

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**b. Between the time you leave home to go to school and classes start**

- Technologies you use (circle all that apply)  
Cell phone  
Laptop/Computer
- Minutes spent by technology: \_\_\_\_\_
- Apps you access: (please list)

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**c. During classes (all day):**

- Do you text? \_\_\_\_\_ How many texts each class (approx.)? \_\_\_\_\_
- Do you check Facebook? \_\_\_\_\_
- Do you access any blogs? \_\_\_\_\_
- Do you go on Instagram? \_\_\_\_\_ Tumblr? \_\_\_\_\_ Twitter? \_\_\_\_\_ BBM?  
Flickr? \_\_\_\_\_

**d. During breaks between classes:**

- Technologies you access (circle all that apply)  
Cell phone  
Laptop/Computer
- Minutes spent by technology: \_\_\_\_\_
- Do you go on Instagram? \_\_\_\_\_ Tumblr? \_\_\_\_\_ Twitter? \_\_\_\_\_ or BBM?  
\_\_\_\_\_

**e. At lunch:**

- Technologies you use (circle all that apply)  
Cell phone  
Television  
Laptop/Computer  
Video Game
- Minutes spent by technology: \_\_\_\_\_
- Applications you access: (please list)

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- TV programs you watch: (please list)

**f. After school hours:**

- Technologies you use (circle all that apply)  
Cell phone  
Television  
Laptop/Computer

Video Game

- Minutes spent by technology: \_\_\_\_\_
- Apps you access: (please list)  
\_\_\_\_\_
- TV programs you watch: (please list)  
\_\_\_\_\_  
\_\_\_\_\_

g. **When you do homework:**

- Technologies you use (circle all that apply)  
Cell phone  
Television  
Laptop/Computer  
Video Game
- Minutes spent by technology: \_\_\_\_\_
- Apps you access: (please list)  
\_\_\_\_\_  
\_\_\_\_\_
- TV programs you watch: (please list)  
\_\_\_\_\_  
\_\_\_\_\_
- How capable are you of multi-tasking (on a scale of 1 (impossible) to 5 (highly capable)? \_\_\_\_\_
- Do you use any tools to block apps to allow you to do homework? If so, which one(s)?  
\_\_\_\_\_

h. **At dinner:**

- Technologies you use (circle all that apply)  
Cell phone  
Television  
Laptop/Computer  
Video Game
- Minutes spent by technology: \_\_\_\_\_
- Apps you access: (please list)  
\_\_\_\_\_  
\_\_\_\_\_
- TV programs you watch: (please list)  
\_\_\_\_\_  
\_\_\_\_\_

i. **After dinner**

- Technologies you use (circle all that apply)  
Cell phone  
Television  
Laptop/Computer  
Video Game
- Minutes spent by technology: \_\_\_\_\_
- Apps you access: (please list)  
\_\_\_\_\_  
\_\_\_\_\_

- TV programs you watch: (please list)

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**3. LET US THINK ABOUT YOUR TYPICAL WEEK-END DAY. THINK ABOUT THE WAYS YOU USE TECHNOLOGY DURING THE WHOLE DAY:**

1) How much time do you watch TV during the week-end? \_\_\_\_\_

2) What TV programs do you watch? (please list)

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3) How much time do you use your computer on the weekend? \_\_\_\_\_

What do you do with your computer? (circle all that apply)

Download music

Download videos

Check Facebook

Access other sites

Other: \_\_\_\_\_

**4. WHEN YOU ACCESS THE INTERNET:**

1) What social networks are you an active member of (circle all that apply)?

Facebook

MySpace

Twitter

Foursquare

Other

2) What applications do you typically access ? (please list)

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3) What video games do you play? (please list)

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4) What blog sites (tumblr, blog spot, cargocollective, flickr) do you access? (please list)

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5) Do you have a blog? \_\_\_\_\_

6) Do you download music? \_\_\_\_\_

6.1. From iTunes? \_\_\_\_\_

6.2. From other sites? \_\_\_\_\_

7) Do you download videos? \_\_\_\_\_

**5. DO YOU USE FACEBOOK?**

IF YES, HOW MANY HOURS A DAY ARE YOU ON FACEBOOK? \_\_\_\_\_

HOW MANY "FRIENDS" DO YOU ESTIMATE TO HAVE? \_\_\_\_\_

**WHEN YOU ARE ON FACEBOOK ON A TYPICAL DAY...**

- 1) How much time are you watching other people's pages (stalking)? \_\_\_\_\_
- 2) How much time are you inputting stuff in your page (creating statuses, adding pictures)? \_\_\_\_\_
- 3) When you are watching other people's pages, how much time is spent watching pages of your close friends versus stalking people you are not close with? \_\_\_\_\_
- 4) How much time do you spend writing on people's walls, writing inboxes, stalking pictures, and chatting with other people online? \_\_\_\_\_

**WHAT DO YOU LIKE ABOUT FACEBOOK?** \_\_\_\_\_

\_\_\_\_\_

**WHAT DON'T YOU LIKE ABOUT FACEBOOK?** \_\_\_\_\_

\_\_\_\_\_

**6. HOW DO YOU PAY FOR THE TECHNOLOGY YOU USE?**

- 1) Cellphone bill (circle the one that applies)  
Your parents pay for it  
You pay for it  
You've agreed a plan with your parents
- 2) Music downloads (circle the one that applies)  
Your parents pay for it  
You pay for it  
You've agreed a plan with your parents
- 3) Videogames purchased (circle the one that applies)  
Your parents pay for it  
You pay for it  
You've agreed a plan with your parents
- 4) Books bought (circle the one that applies)  
Your parents pay for it  
You pay for it  
You've agreed a plan with your parents

**7. CELLPHONE USE**

- 1) What apps do you access from your phone? (please list)

\_\_\_\_\_

- 2) How many minutes are you talking on the phone per day? \_\_\_\_\_
- 3) Do you text or call more? \_\_\_\_\_
- 4) How do you decide whether to call someone or text them? (please explain briefly)

\_\_\_\_\_

- Do you make a decision based on the person you are communicating with? \_\_\_\_\_
- Do you make a decision based on where you are? \_\_\_\_\_

## 8. BESIDES READING FOR SCHOOL, WHAT BOOKS ARE YOU READING FOR FUN NOW?

- 1) How many books have you read since the beginning of the year (not for school)? \_\_\_\_\_
- 2) How many hours a day do you typically spend reading for fun? \_\_\_\_\_
- 3) Do you listen to audio-books for school? \_\_\_\_\_
- 4) Do you listen audio-books for pleasure? \_\_\_\_\_

## 9. WATCHING TV

- 1) How many hours per day are you in front of a TV? \_\_\_\_\_
  - When the TV is on, do you have your computer on (all the time)? \_\_\_\_\_
- 3) Are there any TV shows for which you turn your computer off? (please list)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 4) Which are your favorite channels? Which are your favorite programs? (please list)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 5) Do you stream movies or shows from the Internet using Netflix, Hulu, or other sites? (please list sites you use)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 6) What would you say is the primary way of watching TV (stream online versus watch on television)? \_\_\_\_\_

## 10. TELL US A LITTLE ABOUT YOURSELF

- 1) How old are you? \_\_\_\_\_
- 2) Boy or girl? \_\_\_\_\_
- 3) What school do you go to? \_\_\_\_\_
- 4) What grade? \_\_\_\_\_
- 5) What sports do you practice? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 3) What other things do you do for fun? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 4) What city does your family live in? \_\_\_\_\_
- 7) What are your academic interests on a scale of 1 (low) to 5 (high)?
  - Science/math \_\_\_\_\_
  - Literature/languages \_\_\_\_\_
  - Music \_\_\_\_\_
  - History \_\_\_\_\_
  - Other \_\_\_\_\_

9) How would you characterize your social life?

- Number of hours per day you talk to friends on the phone or in person \_\_\_\_\_
  - How many really close friends do you have? \_\_\_\_\_
  - How many times per week do you go out with friends? \_\_\_\_\_
  - What are your typical social outings? \_\_\_\_\_
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