A Connected Generation? Digital Inequalities in Elementary and High School Students According to Age and Socioeconomic Level

Une génération connectée? Inégalités numériques chez les élèves du primaire et du secondaire selon l'âge et le milieu socioéconomique

Simon Collin, *University of Quebec in Montreal*
Thierry Karsenti, *University of Montreal*
Alexis Ndimubandi, *University of Quebec in Montreal*
Hamid Saffari, *University of Quebec in Montreal*

Abstract

The objective of this article was to better understand the relationship between students' age and socioeconomic level, and its influence on students' digital uses. We conducted a quantitative study of 401 elementary and high school students in Quebec. Four independent variables were initially selected: two related to age (actual age and education level) and two others related to the socioeconomic environment (school poverty index and parents' employment status). The dependent variable that represented students' digital uses was the number of different technologies they used weekly. We conducted correlation tests followed by a linear regression analysis. Socioeconomic level appears to have a stronger influence on students' digital uses compared to age, and explanations for this are proposed.

Résumé

L'objectif de cet article est de mieux comprendre la relation entre l'âge et le milieu socioéconomique des élèves dans leurs usages numériques. Nous avons mené une étude quantitative auprès de 401 élèves du primaire et du secondaire dans la région de Montréal. Quatre variables indépendantes ont été sélectionnées initialement, dont les deux premières renvoient à l'âge (l'âge et l'ordre d'enseignement) alors que les deux dernières renseignent sur le milieu socioéconomique (l'indice de défavorisation des écoles et la situation d'emploi des parents d'élèves). La variable dépendante permettant de rendre compte des usages numériques des élèves était le nombre de technologies qu'ils utilisent sur une base hebdomadaire. Nous avons procédé à une régression linéaire précédée de tests de corrélation. Il en ressort que le niveau socioéconomique semble influencer davantage les usages numériques des élèves que l'âge pour plusieurs raisons explorées dans cette recherche.

Introduction

In recent years, the idea of new student generations, which has widely pervaded the education field through concepts such as "digital natives" (Prensky, 2001a; 2001b), has been strongly questioned. The argument surrounding new student generations challenges the assumption that these students have comprehensive and homogenous digital uses and skills, thus creating a break with previous generations (Jones, Ramanau, Cross, & Healing, 2010). This conception has led to overvaluation of the age variable in determinations of students' digital uses. Based on empirical results, numerous studies have qualified the idea of new student generations by proposing two main arguments: first, these generations would not be consistent in their digital uses (e.g., Jones et al., 2010); and second, age would be only one of many variables that influence students' digital uses (e.g., Hargittai, 2010). On this second point, socioeconomic variables have been widely recognized as influential (Gire & Granjon, 2012). Yet the relationship between age and social origin, and their respective weight in determining students' digital uses has been relatively unexplored, particularly in Francophone Canada.

In this context, the objective of this article was to better understand the relationship between age and socioeconomic level and how it affects digital uses by Quebec students. We begin by recalling the arguments and evidence in support of the idea of new student generations as well as those that qualify them. This is followed by a description of the methodology used and the presentation of the results.

Context

New Student Generations?

Gamer generation (Carstens & Beck, 2005), *neomillennial learners* (Dede, 2005), *instant-message generation* (Lenhart, Rainie & Lewis, 2001), *new millennial learners* (Oblinger & Oblinger, 2005), *digital natives* (Prensky, 2001a; 2001b), and *net generation* (Tapscott, 1998) are just some of the terms that have been used to describe the generations of students who were born at a time when digital technology was becoming more widespread, starting in the early 1980s. These terms, among which digital natives has flourished, indicate that new student generations apparently differ from previous generations, who were known as digital immigrants" (Prensky, 2001a; 2001b). Digital natives, who grew up with information and communication technology (ICT) and have continuously immersed themselves in it, would therefore have a favorable attitude toward digital technology and be comfortable with it (Boubée, 2011; Guichon, 2012; Octobre, 2009). For example, they would use it for learning, unlike digital immigrants, who seem to be "split between skepticism and interest and have trouble learning the technologies" (Brachotte, 2012, p. 12).

Numerous studies confirm a close relationship between new student generations and digital technology. Thus, in their questionnaire survey of Australian university students, Kennedy, Judd, Churchward, Gray, and Krause (2008) found that the participants had unlimited access to a variety of technologies: cellphone (96.4%), desktop computer (89.5%), digital camera (76%), high-speed Internet (72.9%), USB key (72.5%), MP3 player (68.9%), and laptop (63.2%). Only 0.6% (*n*=11) had no access to two of these technologies. Jones et al. (2010), in a study of university students in the United Kingdom, found that young participants (<35 years

old) had access to a wide variety of technologies, including the cellphone (97.8%), USB key (87.9%), and MP3 player (82.4%). These authors identified three main types of Internet uses for education: relational uses (81.5%) and access to resources and course material (93.6% and 89.9%, respectively). Kennedy et al. (2008) found similar results. In France, Octobre (2009) noted that young generations also had substantial Internet access (80% of 13–24-year-olds) and that they tended to access the Internet more for instant messaging and blogging, compared to the population average (63% and 70% of 13–17 year olds), and for other recreational uses such as network games, movie and music downloading, and video and multimedia processing tools.

The idea of new student generations stems from the observation that young people are excited about digital technology. However, the scientific community has criticized extensively this concept since then (e.g., Hargittai, 2010; Helsper and Eynon, 2009; Jones, Ramanau, Cross, and Healing, 2010; Kennedy, Judd, Churchward, and Krause, 2008) because it appears to overvalue the age variable as the guiding principle for students' digital uses, providing a uniform overview of the generational front. Consequently, the disparity of digital uses by new student generations is undervalued, as well as the influence of other factors, such as students' socioeconomic level, as described in the following sections.

Influence of Students' Socioeconomic Level on Digital Uses

Although most students have unlimited access to a range of technologies, there are disparities when it comes to their digital uses, whether educational or not (e.g., Clark, Logan, Luckin, Mee & Oliver, 2009; Jones et al., 2010; Kennedy et al., 2008). Numerous studies agree that, in addition to age and generation, the digital use disparities within new student generations are linked to individual, sociodemographic, cultural, and socioeconomic variables (DiMaggio, Hargittai, Celeste & Shafer, 2004). Studies that have examined this issue have generally used digital inequalities (Collin, 2013) as a backdrop. Digital inequalities are defined as disparities between individuals, homes, and businesses in terms of access to, and use of, digital technology and the Internet for various purposes (OECD, 2010).

In the present study, we focus on socioeconomic variables, which have been recognized as influential on students' digital uses. Thus, Livingstone and Helsper (2007) used interviews to investigate the role of age, gender, and socioeconomic level in Internet access and use in 1,511 teenagers aged 9 to 19 years in the United Kingdom. The results revealed impacts of age and socioeconomic level on Internet access: "Non-users are more likely to be found among the oldest age group [people of 18–19 years old] and the youngest age group [people of 9–11 years old], and they are most common among poorer households" (p. 676). Hargittai (2008, 2010) conducted two studies in an American sample of 1,060 first-year university students to investigate Internet uses according to parents' education level, gender, race, and ethnic origin. A relationship was found between parents' education level and the social network sites that students visited: students with at least one parent who had a university diploma used Facebook, Xanga, and Friendster regularly. They were not as active on MySpace, which was visited by more students whose parents had not graduated from high school.

Hargittai's second study (2010) revealed the impact of socioeconomic level on students' understanding and use of the Internet. Students with the lowest socioeconomic status had poorer Internet skills: they participated in few online activities compared to students at higher

socioeconomic levels. Students with higher economic status also spent more time on the Internet, visited a greater variety of sites, and had a better understanding of the Web. Gire and Granjon (2012) analyzed the digital habits (watching TV and videos, playing video games, and using the computer and Internet) of 1,577 young French individuals aged 15 to 34 years. The authors identified five screen user profiles: *screenagers* (marked TV and new screen consumers), *computer-centered* (daily computer and Internet users)*, moderates* (moderate screen consumers)*, TV-centered* (marked TV consumers) and *no-TV* (TV non-consumers). The results revealed the roles of gender, age, and socioeconomic level. Socioeconomic level was the most influential factor, with wide variation in the distribution of profiles accordingly. For example, only 19% of youth with at least one parent with postsecondary education belonged to the *moderate* or *TV-centered* profile, whereas 38% of youth with no parent with postsecondary education belonged to this profile. More youth from a more advantaged social environment tended to belong to the *computer-centered* profile. Gire and Granjon's (2012) results concur with those of Eynon (2009), who examined Internet access and use according to age, income, education level, geographic location, and Internet experience using data collected in 2003, 2005, and 2007, by the Oxford Internet Institute from British individuals aged 14 years and over.

The results revealed the influence of sociodemographic and socioeconomic factors on Internet use. The percentage of Internet users decreased with age: 86% of 14- to 24-year-olds, 78% of 25- to 54-year-olds, 58% of 55- to 64-year-olds, 37% of 65-74 year olds and 25% of 75-year-olds and older for year 2007. However, Eynon (2009) noted that socioeconomic variables were strong determinants for Internet use. This was especially true for income and education level: in 2007, for example, 91% of respondents with an annual income of more than £50,000 used the Internet, compared to only 39% for those with an annual income of less than £12,500. In terms of education level, 90% of higher education graduates used the Internet, compared to 78% and 55% for high school and elementary school graduates, respectively. These results indicate that although age most probably plays a predominant role in students' digital uses, socioeconomic variables should not be neglected.

This brings a new perspective to the concept of digital natives, which assumes that young people are consistent in their digital uses. The generational break that underlies this concept gives disproportionate weight to age at the expense of other variables, such as socioeconomic variables, as highlighted by Helsper and Eynon (2009): "The paper shows that breadth of use, experience, self-efficacy and education are just as, if not more, important than age in explaining how people become digital natives" (p. 503-504).
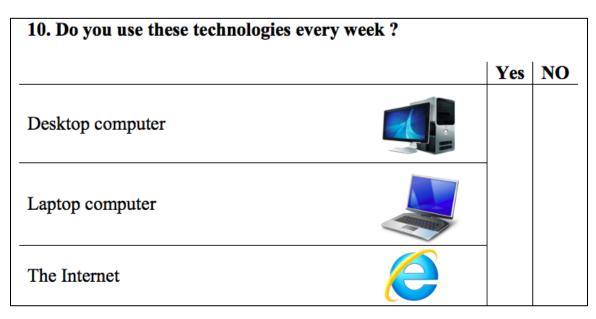
Objective

Despite its popularity in education research, the digital native concept does not fully account for the relationship between new student generations and their uses of digital technology. Focusing largely on the age and generation break, most studies appear to undervalue other dominant factors for students' digital uses, such as their heterogeneity and socioeconomic level. Accordingly, the objective of this article was to better understand the relationship between age and socioeconomic level and its influence on the digital uses of students in Quebec, Canada. Similar studies conducted in the United Kingdom, the United States, Australia, and France (see section *Influence of student's socioeconomic level on digital uses*) suggest that both socioeconomic level and age contribute to the variation in students' digital uses, although their

respective weight remains to be determined, particularly in Quebec, where no studies have addressed this issue to date. In addition, the above-mentioned studies generally address high school or post-high school students. Only recently have a limited number of studies considered elementary schools (e.g., Simoni, Gibson, Cotten, Stringer & Coleman 2016; Heinz, 2016). Yet this is the education level where student populations are the most disparate (Bennett & Maton, 2010). In this respect, the originality of this study lies in the fact that it accounts for elementary as well as high school students, despite the methodological constraints, as we see in the next section.

Method

We used a quantitative method to achieve the study objective. We collected data from 401 student (210 girls and 191 boys) attending 18 classes in elementary and high schools belonging to two school boards in highly urbanized settings. The students completed a paper questionnaire in class. This questionnaire was designed to minimize the cognitive and language barriers that the students may confront. Given the variation in the students' age (see age variable hereunder) and their different cognitive development stages, the level of understanding varied. Consequently, we took several steps to facilitate understanding of the questionnaire content, including wording the questions in plain language, reducing the number of questions, and adding visual aids (see Figure 1).

Figure 1. Example of visual aids included in the questionnaire to help students understand the content.

The questionnaire was commented on and validated by 12 elementary and high school teachers at a training session led by the authors. The final questionnaire contained two sections: the first addressed sociodemographic, socioeconomic, and cultural information to identify the students' sociocultural profile; and the second addressed their digital uses, notably the types of technologies they used weekly (e.g., desktop computer, laptop, Internet using computer access, tablet, cell phone), the places in the home where they used these technologies (e.g., living room,

bedroom), frequency of use, number of years using the Internet, and Internet access locations (e.g., at home, at school, local library), the people in their entourage who used the Internet (e.g., parents, siblings, relatives), and their feelings of competence in using technologies. The researchers were always present to read the questions out loud and answer any questions as the students completed the questionnaire. For the analysis, we initially selected four independent variables, two related to age and two others related to the socioeconomic environment, as follows:

- Age – a continuous variable: the sample age ranged from 7 to 18 years.
- Education level – a dichotomous variable: either elementary (*n*=104) or high school (*n*=297).
- School poverty index – a categorical variable: calculated by the *ministère de l'Éducation du Québec* and used to distinguish non-disadvantaged, disadvantaged, and very disadvantaged schools. In our case, the sample included only schools from non-disadvantaged (155 students) and very disadvantaged (243 students) environments. This type of socioeconomically contrasted sampling is used to better highlight eventual variations in students' socioeconomic profiles, and is widely used in education studies (e.g., Charlot, Bautier & Rochex, 1992) and in studies of digital technology in education (e.g., Daguet, 2000).
- Parents' employment situation – a categorical variable: to distinguish students with only one working parent from those with two working parents.

For the dependent variable, we used the types of technologies that students used every week (see Figure 1 for partial data) to calculate the number of technologies used weekly. This created a new variable representing the diversity of technologies used. This is a reliable variable that can be used to examine the variation in digital uses, as in many studies (e.g., Hargittai, 2010; Helsper & Eynon, 2009; Livingstone & Helsper, 2007; Wei, 2012). We then conducted correlation tests to determine relationships between the four independent variables, and to identify cases of collinearity. Finally, we conducted a linear regression to better understand how the relationship between students' age and socioeconomic level influenced their digital uses.

Results

We begin by painting a descriptive portrait of the students' digital uses. Next, we differentiate the uses according to the four independent variables. We then present the correlation and linear regression results.

Descriptive Portrait of Students' Digital Uses

Only two of the 401 students surveyed (.49%) reported having no access to any technologies on a daily basis. Most students used four (19%), five (25.4%), or six (19.3%) different technologies weekly. Students who used fewer than four per week made up the second largest group (23.6%). At the other end of the spectrum are students who used more than six different technologies weekly (12.6%). Overall, students used 4.7 different technologies weekly on average, with a standard deviation of 1.6, revealing a use continuum rather than distinct categories.

More specifically, the desktop computer (57.8% of respondents) has been largely replaced by the laptop computer (84.8%), and some students used both technologies weekly. A small majority of students used the cellphone, IP telephony (e.g., Skype), and the tablet weekly (52.4%, 57.1%, and 51.9%, respectively). Most students used the Internet daily (67.3%), or at least twice a week (25.8%).

Furthermore, 61.7% of students had access to one or more of these technologies in their room at home, in addition to the common rooms, thus multiplying use opportunities at home. Moreover, the home was by far the most frequent location (96.2%), followed by the school (55.3%), and friends' homes (44.8%). Other public places provided technology access points for some students: local libraries (33.3%) and cybercafes (18.2%). On average, students had 2.4 technology access points, indicating that the home and school are not the only locations to provide digital learning opportunities.

In terms of experience, most students started using the Internet between age 8 and 11 years, and 32.6% of the remaining students had started using the Web at an even younger age. Moreover, 74.8% felt that they had good technological skills, suggesting strong feelings of competence, although it is impossible to infer their actual digital competence.

Finally, 68.9% of students had four or more people (e.g., parents, brothers, or sisters) in their daily environment who used the Internet, which would provide additional opportunities to model and accompany their digital uses, albeit depending on the particular types of use and skills. Inversely, only 0.3% of students had no one in their daily environment who used technologies. In other words, if young people are indeed "big" technology users, the technology "use vs. non-use" criterion does not suffice to distinguish them from other people in their social surroundings, except for a small percentage of the sample.

This global portrait helps identify the main trends across our sample. However, beyond this global portrait, and in line with our research objective, we further analyzed the data to obtain a descriptive portrait of the students' digital uses according to age and socioeconomic level.

Descriptive Portrait of Students' Digital Uses According to Age and Socioeconomic Level

In a first attempt to determine the relationships between students' digital uses, age, and socioeconomic level, we looked at the distribution of the number of technologies they used weekly with respect to the four independent variables: age, education level, school poverty index, and parents' employment situation.

To account for age, we considered two ages: 11 years and 16 years (see Figure 2), corresponding to age at the end of elementary and high school in Quebec, respectively. We noted that most 11-year-olds (71.8%) used from two to four different technologies weekly. In contrast, 16-year-olds were spread out relatively evenly between three and seven different types of technologies being used weekly, showing greater diversity in terms of technology use as well as greater heterogeneity within this subsample.
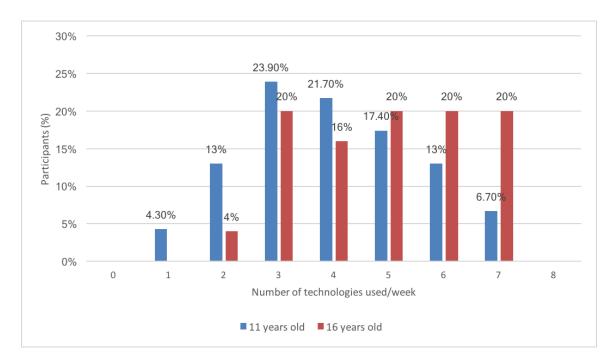
Figure 2. Number of technologies used weekly with respect to students' age.

Regarding education level, we noted that more elementary students used two to four technologies weekly compared to high school students (see Figure 3). In contrast, more high school students used five or more technologies weekly compared to elementary students.
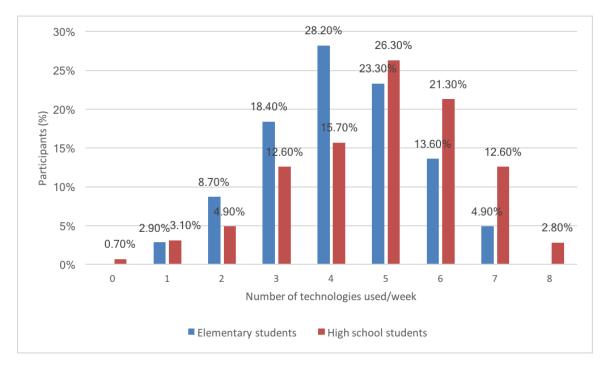

Figure 3. Number of technologies used weekly with respect to students' education level.

Concerning the school poverty index, the distribution between students from very disadvantaged environments and from non-disadvantaged environments differs slightly from the distribution between age and education level (see Figure 4). Thus, students from very disadvantaged environments dominate the range from zero to three technologies used weekly. The reverse trend is observed for the range from four to five technologies used weekly, indicating that students from non-disadvantaged environments used more technologies weekly. However, some rebalance appears for the use of six, seven, or eight technologies weekly, where these two subgroups are about equally represented. In other words, beyond six technologies weekly, socioeconomic level no longer differentiates the students.
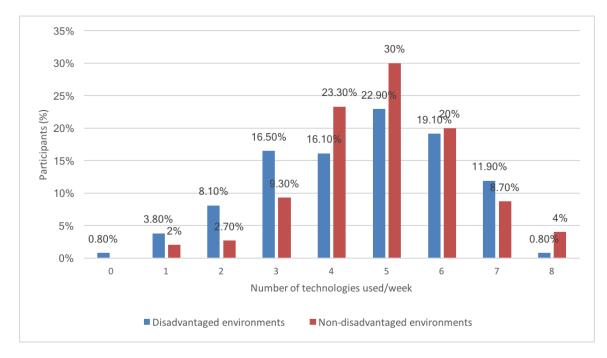

Figure 4. Number of technologies used weekly with respect to the school poverty index.

Finally, parents' employment situation shows a trend similar to that for education level. Students from families with only one working parent are more strongly represented in the one-to-five uses category than students from families with two working parents (with the exception of three technologies/week). In contrast, students with two working parents are more strongly represented in the six technologies weekly category (see Figure 5).
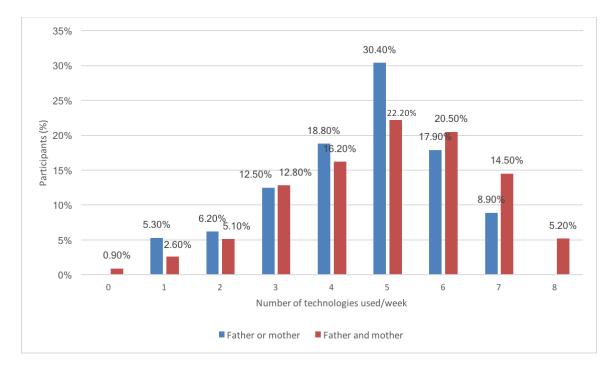
Figure 5. Number of technologies used weekly with respect to parents' employment situation.

Taken together, the number of technologies used weekly fluctuates according to the four variables, but with slightly different trends across the variables. More specifically, older high school students from non-disadvantaged environments and with two working parents used a greater variety of technologies than other students. However, these descriptive results do not allow for determining the specific or cumulated influence of the variables on the diversity of technologies that the students used. Therefore, to understand the influence of age and socioeconomic level on the number of technologies used weekly by students, we used both correlation and linear regression analyses.

Influence of Age and Socioeconomic Level on the Variation in the Number of Technologies Used Weekly by Students

In this section, we begin by presenting the results of the preliminary statistics followed by the results of the linear regression.

Preliminary statistical analyses. We begin with the correlations between the four independent variables: age, education level, school poverty index, and parents' employment situation. As shown in the correlation matrix in Table 1, parents' employment situation is negatively and weakly correlated to age (r=-.17, p<.01), as are school poverty index and age (r=-.10, p=.04). In contrast, education level is strongly correlated to age (r=.63, p<.01), indicating that these two variables are collinear.

Table 1

Intercorrelations Between Variables

Variable	2	3	4
1. Age	.63	-.10	-.17
2. Education level		.01	.10
3. School poverty index			-.02
4. Parents' employment situation			

To further examine the relationship between these two variables, we conducted a linear regression using the number of technologies used weekly by students as the dependent variable. It appears that although education level explains part of the variance in the number of technologies used weekly (β=.17, $t(236)$=3.41, p<.01), this relationship becomes insignificant (β=.08, $t(236)$=1.28, p=.20) once age (β=.13, $t(236)$=2.02, p=.04) is included in the regression model. We therefore excluded education level from the final regression model, which includes three predictive variables. Two of these are related to socioeconomic level (school poverty index and parents' employment situation) and one corresponds to age (actual age of respondents).

Final linear regression model. The final linear regression model included three steps: inclusion of age, addition of the two socioeconomic variables, and measurement of the double interactions between the socioeconomic variables and age. An overview of the model, presented in Table 2, shows that each step contributes significantly to increase the portion of the variance in the number of technologies used weekly that is explained by the model.

Table 2

Summary of Regression Models

Model	R	R^2	R^2 adjusted	Sig.
1	.16[a]	.02	.02	.02
2	.26[b]	.07	.06	.01
3	.31[c]	.10	.08	.04

We note that age explains 2.5% of the variance and that the socioeconomic variables explain 4.4%. Thus, the cumulated variables age and socioeconomic level significantly explain 6.9% of the variance in the number of technologies used weekly by students ($F(3)$=5.54, p<.01). Furthermore, their interaction adds 2.7% of the explained variance, which is significant, for a total of 9.6% of the variance explained by the final model ($F(5)$=4.71, p=.04). This corresponds to a small yet non-marginal predictive value.

It is important to note, however, that at step 3 of the model, age and the school poverty index do not interact. Therefore, each makes a distinct contribution to the prediction, as shown in Table 3.

Table 3

Multiple Linear Regressions for Age and the School Poverty Index with Respect to the Number of Technologies Used Weekly by Students

Model		A	β	*t*	Sig.
1	Age	.13	.16	2.42	.02
2	Age	.17	.21	3.16	.00
	Parents' employment	.56	.17	2.55	.01
	School poverty index	.50	.14	2.19	.03
3	Age	.18	.22	3.36	.001
	Parents' employment	.43	.13	1.92	.06
	School poverty index	.61	.17	2.64	.01
	Age x parents' employment	.28	.17	2.52	.01
	Age x school poverty index	-.09	-.05	-.83	.41

Concerning the interaction between age and parents' employment situation, a *simple slope* analysis indicates that the double interaction is significant only for families with two working parents (R^2 *adjusted*=.09, $F(2)$=6.71, *p*<.01). In contrast, there are no significant differences according to age in families with only one working parent (R^2 *adjusted*=.02, $F(2)$=2.41, *p*=.09). In other words, the increase in the number of technologies used weekly with age is significant only for students with two working parents, unlike students with only one working parent, and corroborating the descriptive results.

Discussion

The objective of this article was to better understand the relationships between age and socioeconomic level, and its influence on the digital uses of elementary and high school students.

First, we drew a descriptive portrait of the students' digital uses to determine how present digital technology was in their lives. The students had access to an average of 4.7 technologies per week. This is in keeping with the results of other authors, such as Kennedy et al. (2008), Jones et al. (2010), and Guichon (2012), to name a few. In terms of computer use, more respondents in our sample used a laptop (84.8%) than a desktop computer (57.8%). These results are similar to those of Guichon (2012), but contrary to those of Kennedy et al. (2008), who found that the desktop computer superseded the laptop, with 89.5% and 63.2% of respondents, respectively. This discrepancy between results may be partly attributable to technological changes, as Kennedy et al.'s study dates back to 2008. Most students in our study had ample Internet access and considered themselves to be competent in the use of digital technologies, which concurs with the results of Octobre (2009) and Guichon (2012).

We then drew a descriptive portrait of the variation in the number of technologies used weekly according to students' age and socioeconomic level. This portrait reveals the impact of these variables on students' access and use of digital tools: Older students from non-

disadvantaged environments used more technologies weekly than their younger counterparts. In terms of age, we noted that 16-year-olds used almost twice the number of technologies as 11-year-olds. Studies by Livingstone and Helsper (2007) and Eynon (2009) revealed a similar age trend in the access and use of digital technology. Concerning the role of the socioeconomic environment, our results show that students from disadvantaged environments used fewer technologies weekly. This corroborates the results obtained by Hargittai (2008, 2010), who established a relationship between parents' education level and the number of social network sites that students visited: students from a higher socioeconomic background participated in more online activities and visited a wider variety of social networking sites.

Lastly, a linear regression model was tested using age, the school poverty index, and parents' employment situation as variables to determine their interrelationships and the influence on students' digital uses. The results indicate that age, both socioeconomic variables, and their interactions predicted approximately 10% of the variance in the number of technologies used weekly, corresponding to a small but present predictive value. More specifically, age and the school poverty index each explained a specific part of the variance, while parents' employment situation intervened only when interacted with age, and only for families with two working parents. In contrast, students from families with one working parent were not distinguished from other students according to age.

Note also that the socioeconomic variables predicted a larger portion of the variation compared to age (4.4% vs. 2.5%, respectively). Gire and Granjon (2012) and Eynon (2009) also noted that socioeconomic variables were more determinant than sociodemographic variables (including age) for technology access and use. They found that social origin was more influential than age on screen consumption in 15- to 34-year-olds: although they used numerous screens, the distribution of user profiles according to age showed no notable trend. However, the profiles differed strongly according to social origin, represented by the parents' education. Eynon (2009) determined that Internet use was strongly correlated to parents' income and education. In sum, age cannot be the only guiding principle for students' digital uses, as discussions among new student generations suggest.

Conclusion

These results have useful implications for education. Like previous studies, they challenge the idea of a "connected generation," a concept that various researchers (Carstens & Beck, 2005; Dede, 2005; Lenhart, Rainie & Lewis, 2001; Oblinger & Oblinger, 2005; Prensky, 2001a; Tapscott, 1998) have described using different terms. Our results call for greater attention to students' socioeconomic environment when designing initiatives to integrate digital technologies into education. Given that the socioeconomic environment is variable, it can generate more or less rich and diversified digital uses by students. One way for schools to respond would be to introduce media education courses to ensure some consistency in students' uses of technologies for educational purposes.

References

Boubée, N. (2011). Caractériser les pratiques informationnelles des jeunes : Les problèmes laissés ouverts par les deux conceptions «natifs» et «naïfs» numériques. *Communication* Rencontres Savoirs CDI, Rennes, 1-14. Retrieved from https://www.reseau-canope.fr/savoirscdi/fileadmin/fichiers_auteurs/Actes/Rennes_2011/NB-RencontresSavoirsCDI-oct2011.pdf

Brachotte, G. (2012). Natif du numérique versus immigrant du numérique : un lien social intergénérationnel reconfiguré par les dispositifs ? In P. Lardellier et R. Delaye (Eds.), Entreprise et sacré : regards transdisciplinaires. Paris, France: Hermes-Lavoisier. Retrieved from http://www.propedia-igs.fr/wp-content/uploads/2012/02/BRACHOTTE_G.pdf

Carstens, A. & Beck, J. (2005). Get Ready for the Gamer Generation. *TechTrends*, *49*(3), 22-25. doi:10.1007/bf02763643

Charlot, B., Bautier, E. & Rochex, J.-Y. (1992). *École et savoir dans les banlieues et ailleurs*. Paris, France: Armand Colin.

Clark, W., Logan, K., Luckin, R., Mee, A. & Oliver, M. (2009). Beyond web 2.0: Mapping the technology landscapes of young learners. *Journal of Computer Assisted Learning*, *25*(1), 56–69. doi:10.1111/j.1365-2729.2008.00305.x

Collin, S. (2013). Les inégalités numériques en éducation. *Adjectif*. Retrieved from http://www.adjectif.net/spip/spip.php?article254

Comité de Gestion de la Taxe de l'Île de Montréal (2014). *Portrait socioculturel des élèves inscrits dans les écoles publiques de l'île de Montréal*. Retrieved from http://www.cgtsim.qc.ca/fr/documents-site-web/101-pscei2013/file

Daguet, H. (2000). Tic et pratiques enseignantes au collège : Analyses et perspectives. In G.-L. Baron, E. Bruillard & J.-F. Levy (Eds.), *Les technologies dans la classe : de l'innovation à l'intégration* (pp. 37-51). Paris, France: INRP, EPI.

Dede, C. (2005). Planning for neomillennial learning styles: Implications for investments in technology and faculty. In D. Oblinger & J. Oblinger (Eds.), *Educating the Net Generation* (pp. 15.1–15.22). Retrieved from https://net.educause.edu/ir/library/pdf/pub7101.pdf

DiMaggio, P., Hargittai, E., Celeste, C. & Shafer, S. (2004). Digital inequality: From unequal access to differentiated use. In K. Neckerman (Eds.), *Social Inequality* (pp. 355-400). New York, NY: Russell Sage Foundation. Retrieved from http://www.eszter.com/research/c05-digitalinequality.html

Eynon, R. (2009). Mapping the digital divide in Britain: Implications for learning and education. *Learning, Media and Technology*, *34*(4), 277-290. doi:10.1080/17439880903345874

Gire, F. & Granjon, F. (2012). Les pratiques des écrans des jeunes français. Déterminants sociaux et pratiques culturelles associées. *Reset*, *1*(1), 53-88. doi:10.4000/reset.132

Hargittai, E. (2008). Whose space? Differences among users and non-users of social network sites. *Journal of Computer-Mediated Communication*, *13(1)*, 276-297. doi:10.1111/j.1083-6101.2007.00396.x

Hargittai, E. (2010). Digital na(t)ives? Variation in internet skills and uses among members of the "net generation." *Sociological Inquiry*, *80*(1), 92-113. doi:10.1111/j.1475-682X.2009.00317.x

Heinz, J. (2016). Digital skills and the influence of students' socio-economic background. An exploratory study in German elementary schools. *Italian Journal of Sociology of Education, 8*(2), 186-212. doi:10.14658/pupj-ijse-2016-2-9

Helsper, E. J. & Eynon, R. (2009). Digital natives: Where is the evidence? *British Educational Research Journal*, *36*(3), 503-520. doi:10.1080/01411920902989227

Jones, C., Ramanau, R., Cross, S. & Healing, G. (2010). Net generation or digital natives: Is there a distinct new generation entering university? *Computers & Education, 54*(3), 722-732. doi:10.1016/j.compedu.2009.09.022

Kennedy, G. E. Judd, T. S. Churchward, A., Gray, K. & Krause, K-L. (2008). First year students' experiences with technology: Are they really digital natives? *Australian Journal of Educational Technology*, *24*(1), 108-122. Retrieved from http://www98.griffith.edu.au/dspace/bitstream/handle/10072/26021/53548_1.pdf?sequence=1

Lenhart, A., Rainie, L. & Lewis, O. (2001). *Teenage life online: The rise of the instant-message generation and the Internet's impact on friendships and family relationships*. Washington, DC: Pew Internet and American Life Project. Retrieved from http://www.pewinternet.org/files/old-media/Files/Reports/2001/PIP_Teens_Report.pdf.pdf

Livingstone, S., & Helsper, E. J. (2007). Gradations in digital inclusion: Children, young people and the digital divide. *New Media & Society*, *9*(4), 671-696. doi:10.1177/1461444807080335

Oblinger, D. G. & Oblinger, J. L. (2005). *Educating the net generation*. Washington, DC: Educause. Retrieved from www.educause.edu/educatingthenetgen/

OECD (2010). *Are the new millennium learners making the grade?: Technology use and educational performance in PISA 2006* (series Educational Research and Innovation). Paris, France: OECD Publishing. doi:10.1787/9789264076044-en

Octobre, S. (2009). Pratiques culturelles chez les jeunes et institutions de transmission : un choc de cultures ? *Culture Prospective*, *1,* 1-8. Retrieved from http://www2.culture.gouv.fr/culture/deps/2008/pdf/Cprospective09-1.pdf

Prensky, M. (2001a). Digital natives, digital immigrants part I. *On the Horizon*, *9*(5), 1-6. doi:10.1108/10748120110424816

Prensky, M. (2001b). Digital natives, digital immigrants part II: Do they really think differently? *On the Horizon*, *9*(6), 1-6. doi:10.1108/10748120110424843

Simoni, Z., Gibson, P., Cotten, S., Stringer, K. & Coleman, L. (2016). Does place matter? The effects of concentrated poverty on the computer use of elementary students. *Journal of Urban Technology, 23*(3), 3-21. doi:10.1080/10630732.2015.1073901

Tapscott, D. (1998). *Growing up digital. The rise of the net generation*. New York, NY: McGraw Hill.

Wei, L. (2012). Number matters: The multimodality of internet use as an indicator of the digital inequalities. *Journal of Computer-Mediated Communication*, *17*(3), 303-318. doi:10.1111/j.1083-6101.2012.01578.x

Authors

Simon Collin is a professor at the Faculty of Education at the University of Québec in Montréal, Canada. He holds the Canada Research Chair in Sociocultural Issues of Digital Technology in Education. Email: collin.simon@uqam.ca

Thierry Karsenti holds the Canada Research Chair on Information and Communication Technologies in Education. He is also a professor at the Faculty of Education at the University of Montréal, Canada. Email: thierry.karsenti@umontreal.ca

Alexis Ndimubandi is a PhD student in Education at the University of Québec in Montréal, Canada. Email: ndimubandi.alexis@courrier.uqam.ca

Hamid Saffari is a PhD student in Education at the University of Québec in Montréal, Canada. Email: saffari_shahrbabaki.hamid@courrier.uqam.ca