PEL

Pensamiento Educativo. Revista de Investigación Educacional Latinoamericana
2019, 56(2), 1-13

Pontificia Universidad Católica de Chile
Facultad de Educación

Use of ICT Among Chilean University Students: Approach from the Perspective of Emerging Adulthood

Uso de TIC en estudiantes universitarios chilenos: enfoque desde la adultez emergente

Christian Labbé, Leonardo López-Neira, José L. Saiz, Eugenia V. Vinet y Paula Boero

Universidad de La Frontera, Chile

Abstract

Emerging adulthood (EA) is a stage of development in which, having finished adolescence, the assumption of adulthood is postponed. There is evidence that the use of information and communication technologies (ICTs) can be related to the tasks in EA. Using the EA approach, the objective of this quantitative study was to characterize the use of ICTs among emerging adults, all students of Chilean universities, and examine the effect of gender, socioeconomic status, and age in this use. An intentional sample of 1,469 students answered a questionnaire that investigated different aspects of their experience with ICTs. The results show that students access computers more and use ICTs more frequently than the general population for a set of activities. A gender effect was observed in the time spent using ICTs each day, but no effects of socioeconomic status or age were found. In addition, four types of ICT use were identified: communicative, informative, hedonistic, and utilitarian. Men make greater hedonistic use and less utilitarian use of ICTs than women. Socioeconomic status is related to informative and hedonistic use, while, on the other hand, age is associated with communicative and informative use.

Keywords: digital gap, emerging adulthood, information technology, university students.

Post to:
Christian Labbé
Instituto de Informática Educativa, Universidad de La Frontera
Montevideo 0830, Temuco, Chile
christian.labbe@iie.cl
Financiamiento asociado: Este estudio fue financiado por la Comisión Nacional de Investigación Científica y Tecnológica (Conicyt) de Chile, a través del proyecto Fondecyt 1150095.

ISSN:0719-0409 DDI:203.262, Santiago, Chile doi: 10.7764/PEL.56.2.2019.2

Resumen

La adultez emergente es una etapa en la cual, habiéndose finalizado la adolescencia, se posterga la asunción a la adultez. Hay evidencia de que el uso de tecnologías de información y comunicación puede relacionarse con tareas propias de esta etapa. Utilizando el enfoque de la adultez emergente, el presente estudio cuantitativo tuvo por objetivo caracterizar el uso de Tecnologías de la Información y Comunicación (TIC) en adultos emergentes, todos estudiantes de universidades chilenas, y examinar el efecto del sexo, nivel socioeconómico y edad en tal uso. Una muestra intencionada de 1.469 estudiantes respondió un cuestionario que indagaba distintos aspectos de la experiencia con TIC. Los resultados muestran que, comparados con la población general, los estudiantes acceden más al computador y emplean las TIC con mayor frecuencia para un conjunto de actividades. En el tiempo de uso diario de TIC se observó un efecto del sexo, pero no del nivel socioeconómico ni de la edad. Además, se identificaron cuatro tipos de uso de TIC: comunicativo, informativo, hedonista y utilitario. Los hombres hacen mayor uso hedonista y menor uso utilitario que las mujeres. El nivel socioeconómico se relaciona con el uso informativo y hedonista, en tanto que la edad se asocia con el uso comunicativo e informativo.

Palabras clave: adultez emergente, brecha digital, estudiante universitario, tecnología de la información.

Introduction

In industrialized western societies, university students are classed as part of a new evolutionary stage of human development called emerging adulthood (henceforth EA). This stage, which encompasses the period between 18 and 29 years of age, is characterized by the ambivalence of these individuals towards their status as adults, as they have completed the stage of adolescence, but are yet to assume adult roles (Nelson & Barry, 2005). Following the trend in developed nations, in Chile in recent years university students have become a highly significant population group, given their number and importance to the country's social, cultural, and economic development. In this regard, identifying their characteristics will allow the observer to identify personal, family, social, and/or academic aspects that may be positively or negatively influenced by the use of technology. In this light, a detailed description of the use of information and communications technology (ICT) will help define areas in which some type of support for the development of individuals may be necessary.

Arnett (2014) defined EA as a period that is characterized by the exploration of identity, instability, great optimism and possibilities, "self focus", and feeling "in-between" regarding adolescence and adulthood. Tanner and Arnett (2009) argued that there are three sub-stages in EA, determined by certain "recentering" tasks on the part of the individual:

- In Stage 1 the adolescent transitions into EA, in which a change begins in the individual's social and family roles and relationships, mainly with the parents. In this period, legal and social responsibility is transferred to the individual and they begin to transition from being a receiver of advice, care, and financial resources to a more horizontal role, where they makes gains in self-determination, financial independence, and more equal treatment with their parents.

- Stage 2, which comprises EA itself, is characterized by a transitory commitment in the areas of higher education, work experience, and romantic relationships, which could involve going through several university courses, different types of work, and romantic relationships.
- In Stage 3 the individual begins to assume adult roles and responsibilities, such as working on a career, establishing a stable romantic relationship, and assuming parental responsibilities.

In recent years, the irruption of ICTs has opened up a new area of research related to the use of these technologies and their relation with EA. In this respect, it is suggested that widespread use of ICTs has not only changed the way in which day-to-day activities are carried out (communication, commerce, and work, for example), but they have also changed the dynamics of social relationships in the different periods of psychological development, aspects that have started being explored in the last decade.

In particular, some authors suggest that the use of ICTs may respond to needs related to certain tasks of autonomy, identity, and intimacy, specific to EA (Coyne, Padilla-Walker & Howard, 2013, 2014). First, regarding tasks of autonomy, use of ICTs may be associated with increasing the levels of independence shown, for example, in increased time of using ICTs and in the breadth of content that is accessed, since the parental restrictions that are common in adolescence (for example, in the amount of hours used for ICTs, access to websites with adult content, etc.) begin to disappear (Arnett & Schwab, 2012). Second, in terms of identity tasks, Padilla-Walker (2007) argues that emerging adults share adolescent behaviors in using ICTs, that is, they seek multimedia resources as a way of exploring their identity, particularly in terms of gender, sexuality, and ethnicity. Finally, as regards privacy, emerging adults would be at a stage where they begin to deepen their friendship and romantic relationships through the use of social networks, which enhances contact, communication, and development of social relationships, which can range from superficial to profound and intimate.

The literature shows that emerging adults differ in their frequency of using ICTs depending on the type of technology, gender, and country. In this regard, Padilla-Walker, Nelson, Carroll, and Jensen (2010) found that emerging adults spend more time using the internet to listen to music than for other activities, while men also used ICTs more frequently than women to play. Meanwhile, Kimbrough, Guadagno, Muscanell, and Dill (2013) noted that women more frequently used technology-mediated communication, particularly instant text messaging, social media, and video calls. And finally, while Belgian university students devoted an average of 2.5 hours per day to using ICTs (Tondeur, Van de Velde, Vermeersch, & Van Houtte, 2016), students in Saudi Arabia devoted some six hours a day to such technologies (Alothman, Robertson, & Michaelson, 2017).

Although there are various classifications of types of ICT use, they generally refer to activities related to searching for information, news, personal development, social interaction, leisure, commercial transactions, and gaming (Van Deursen & Van Dijk, 2014). At present, debate regarding the use of ICTs no longer focuses on the dichotomy of those who have either have or lack access to them, but on the use (type of use) that people make of them. In this regard, Pearce and Rice (2013) argue that although the majority of the population could potentially benefit from ICTs, those with more cognitive, educational, and economic resources will benefit ahead of those with fewer resources. Studies have verified that university students mainly use the web to conduct activities related to the improvement of their social and cultural capital (Hargittai & Hinnant, 2008), and creative activities (Hargittai & Walejko, 2008).

In Chile, growth of ICTs has been explosive in the last two decades. As current university students were born surrounded by digital technologies they can be considered digital natives. According to Prensky (2001), a digital native is a person who uses and exploits ICTs naturally. A recent study with a representative national sample of subjects between 16 and 80 years of age, showed that 90% have access to mobile smartphones, 54% have access to a desktop or laptop computer, and 71.6% have access to the internet (Pinto de la Fuente & González, 2016a). As regards their frequency of internet use, 85% state they have used the internet at least once a day in the last

12 months, highlighting the use of the web to communicate via WhatsApp (67.7%), social media (64.5%), and email (60.2%). To a lesser extent, use of ICTs is observed in order to carry out work or reports on some course, subject, or training workshop (43.8%), download or listen to music online (43.3%), surf the internet (43.2%), and carry out work or reports related to employment activity (40.2%) (Pinto de la Fuente & González, 2016b).

In the aforementioned context and using the perspective of EA, this study was intended to characterize the use of ICTs among emerging adults, specifically considering Chilean university students, and examine the effects of gender, socioeconomic status (SES), and age on this use. Considering the literature reviewed, emerging adults are expected to use ICT more frequently than the general population, while women should use ICT more frequently to communicate and participate in social networks, and men should use them more to play and for entertainment. In addition, taking into account the different sub-stages of EA, different uses are suggested according to the age of the students. Finally, given the differences in social and cultural capital among emerging adults, patterns of unequal use are proposed according to socioeconomic status.

Methodology

Participants

The participants in this study were undergraduate students from four Chilean public universities in different geographical areas of the country. The sample consisted of 1,469 subjects, who were intentionally selected considering the following criteria: aged between 18 and 29, undergraduate students, and Chilean. The participants had an average age of 21 and 52% of them were women. As regards the geographical origin of the students, they were distributed almost evenly among different areas of the country (34.2% north; 33.2% central; and 32.6% south). In terms of their socioeconomic status, 29.8% are considered to be in the low and medium low levels; 29.6% at medium level; and 40.6% in the medium-high, high, and very high levels.

Instruments

A questionnaire that was built ad hoc was used, investigating experiences with ICTs, which was part of a larger series of instruments designed to characterize the emerging adult university student in Chile. The questionnaire included three relevant sections. In the first, the participants were asked to indicate whether or not they had access, for personal use, to eight types of technological device (desktop computer, laptop, basic cell phone, cellular smartphone, USB memory, tablet, digital music player, and game console). The answers were coded as 1 (Yes) or 0 (No). In the second section, the respondents reported the number of hours they spent using ICTs on a normal day, on a scale from 0 (*Never or almost never*) to 3 (*Always or almost always*). In the third section, the participants stated how often they carried out 12 activities with ICTs (see Figure 1). These activities were taken from other instruments applied to the population of young people (Claro et al., 2012; Hinostroza, Matamala, Labbé, Claro, & Cabello, 2014). In addition, the participants provided sociodemographic information in another section of the series of instruments.

Statistical analysis

The socioeconomic status was estimated using the ESOMAR procedure (Adimark, 2000), which is based on the educational level and employment category of the head of the participant's household. This procedure provides six socioeconomic levels (low, medium-low, medium, medium-high, high, and very high). To avoid levels with

low frequencies, these six categories were reduced to three: low (which included the two lowest levels), medium (which remained unchanged), and high (which included the upper three levels). Similarly, to avoid values of low frequencies, age was grouped into four segments: 18 to 19; 20 to 21; 22 to 23; and 24 to 29.

As regards statistical tests, firstly the comparison of independent proportions was applied to compare the participants to Chile's general population in terms of access to technological devices and the status of ICT users in the 12 activities surveyed. The data for the general population were obtained from Pinto de la Fuente and González (2016b). Secondly, the amount hours spent using ICTs each day was analyzed according to gender using unifactorial ANOVA and depending on the SES, while age was measured using trend analysis, taking into account the ordinal nature of the last two variables. Thirdly, we proceeded to identify the dimensions underlying the frequency with which the participants carried out the 12 activities with ICTs. In order to do this, an exploratory factor analysis (EFA) was carried out using the FACTOR program (Lorenzo-Seva & Ferrando, 2006), based on the inter-item polymorphic correlations, following the recommendation of Muthén and Kaplan (1985) for Likert-type items. The factorization and rotation methods used were unweighted least squares and Promin, respectively. The number of factors retained was based on a classic parallel analysis (Horn, 1965). The reliability of each factor was estimated using the ordinal alpha coefficient using the procedure developed by Domínguez Lara (2012) for its calculation.

Finally, three intersubject unifactor MANOVAS procedures were calculated, using gender, SES, and age as independent variables, respectively, and, in all of them, using the individual scores resulting from each factor retained in the previous EFA as dependent variables. In the analysis of gender, the MANOVA calculation was followed by four unifactor ANOVAS, one for each dependent variable. Once again, addressing their status as ordinal independent variables, in the SES and gender analysis, the MANOVAS were followed by four trend analyses (linear, quadratic, and cubic), one for each dependent variable. In all of the MANOVAS, Wilks' lambda criterion was used to measure the discriminant power of the variables. In all analyses, except for the EFA, the effect size was calculated with Cohen's *d* coefficient; *d* values equal to 0.20, 0.50, and 0.80 can be interpreted as small, medium, and large, respectively.

Procedure

The invitation to participate in the project of which this study is part was disseminated among students through the undergraduate administrations, degree course directors, and lecturers at the participating universities. Those interested attended briefings to present the objectives of the study and the tasks involved in their participation. Those who agreed to take part signed an informed consent previously approved by the Scientific Ethics Committee of the university that led the project. Participation was voluntary, anonymous, and confidential. Participants responded to the series of instruments during 2016 by answering them online (in computer labs) or using pen and paper (in classrooms), in both cases with face-to-face support from research assistants. The psychometric equivalence of the data collected through these two modes of administration was demonstrated previously.

Results

Access to and time using ICTs

Compared to the general population, significantly higher percentages of emerging adults reported having personal access to desktop or laptop computers (97% versus 55%; $z = 29.41$; $p < 0.001$; $d = 0.91$) and mobile smartphones (92% versus 80%; $z = 2.21$; $p < 0.05$; $d = 0.06$). No significant differences were observed regarding

access to the other technologies studied. On average, the study participants spend 7.4 hours using ICTs during a normal day. Women reported spending greater time on their daily use of ICTs (M = 7.7; SD = 4.0) than men (M = 7.1; SD = 4.3), F (1, 1457) = 8.25; p = 0.004; d = 0.16. Trend analyses showed that the daily amount of time spent using ICTs does not vary significantly depending on socioeconomic status or age.

Use of ICTs depending on activities

Figure 1 shows a comparison of university students and the general population in terms of the percentage of ICT users in the 12 activities studied. A student was considered to be a user an activity if he/she answered *Always or almost always* when asked about their frequency of using ICTs in that activity. Among the students, the most popular activities (with 90% or more users) were chat and using social media. On the other hand, significantly higher percentages of students compared to the general population use ICTs to chat (91% versus 68%, z = 17.49; p <0.001, d = 0.51), use social media (90% versus 65%, z = 18.69; p <0.001, d = 0.54), listen to music or watch movies online (60% versus 43%, z = 10.80; p <0.001, d = 0.31), search for information (59% versus 43%, z = 9.31; p <0.001, d = 0.27), read news or articles (46% versus 25%, z = 14.16; p <0.001, d = 0.41), watch television or listen to radio online (60% versus 43%, z = 10.80; p <0.001, d = 0.31), and make online purchases (9% versus 7%, z = 3.07; p <0.01, d = 0.10). Significant differences were also observed in favor of the general population regarding making calls via computer (30% versus 17%, z = -9.34; p <0.001, d = 0.27) and recording and uploading photos, audio, or videos (35% versus 20%, z = -10.12; p <0.001, d = 0.29). The students did not differ significantly from the general population in the activities of sending and receiving emails (59% versus 60%) and playing (23% versus 20%). It should be noted that it was not possible to compare these two groups regarding the activity of editing photos or videos, since this information is not reported in the study on the general population (Pinto de la Fuente & González, 2016b). In any case, in this study, the percentage of users of ICTs for editing photos or videos was 14%.

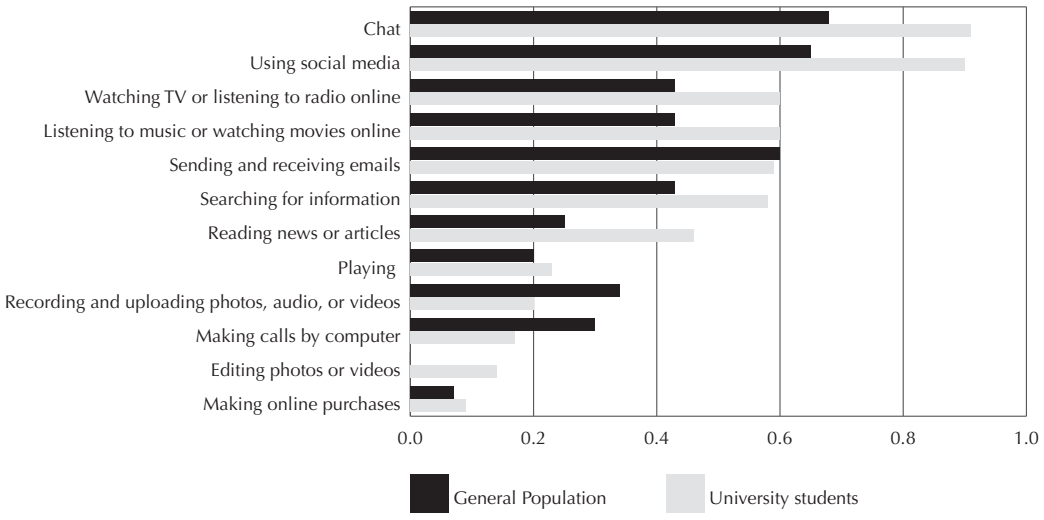

Figure 1. Users of ICTs (as a %) according to activities in university students and the general population.
Source: Prepared by the authors.

Frequency of using ICTs according to gender, SES, and age

The exploratory factor analysis showed that the frequencies of ICT use in the 12 activities examined can be reduced to four interpretable dimensions: communicative use (F1), informative use (F2), hedonistic use (F3), and utilitarian use (F4). Bartlett's statistic was 2750.6, p <0.001, and the KMO index was 0.74, indicating that the data were conducive to factor analysis. Table 1 shows the configuration obtained, the percentage of variance explained by each factor, and the respective ordinal alpha reliability coefficients. An individual score was calculated in each dimension, with averages calculated for the responses given by the participant to the items that comprise the dimension. Higher scores reflect a greater frequency in the type of use reflected by the dimension. The four scores showed significant correlation with each other, indicating a lack of orthogonality. In order to ensure this, we obtained the standardized residuals of each score by means of multiple regressions in which the score of interest acted as a criterion and the other three scores as predictors. These four residual scores, expressed in the score z, which were now independent of one other, were used in the following analyses as indicators of the individual frequency of each type of ICT use.

Table 1. Uses of ICTs: Results of exploratory factor analysis

	F1	F2	F3	F4
Actividades	Communicative use	Informative use	Hedonistic use	Utilitarian use
Using social media	0.851	0.015	0.060	0.015
Chat	0.701	0.049	–0.067	0.225
Searching for information	–0.035	0.978	–0.097	0.019
Reading news or articles	0.052	0.658	0.141	–0.031
Watching TV or listening to radio online	0.076	–0.077	0.651	–0.006
Listening to music or watching movies online	0.092	0.028	0.594	–0.020
Playing	–0.131	0.036	0.350	0.060
Recording and uploading photos, audio, or videos	0.093	–0.086	–0.038	0.754
Editing photos or videos	–0.159	0.015	0.071	0.690
Making calls by computer	–0.067	–0.043	0.199	0.480
Sending and receiving emails	0.069	0.238	–0.208	0.422
Making online purchases	–0.211	0.149	0.187	0.413
Variance explained (%)	31.37	12.38	11.12	8.30
Alpha ordinal	0.75	0.78	0.53	0.68

Note. Factorial loads greater than 0.30 are underlined, indicating the pertinence of the activity to the factor.
Source: Prepared by the authors.

The MANOVA procedure revealed that the combination of dependent variables was significantly affected by the gender of the participants, $F(4, 1459) = 23.29$, $p < 0.001$, $d = 0.51$). The subsequent unifactorial ANOVAs showed significant effects of the gender variable in each of the four ICT uses: communicative use, $F(1, 1462) = 6.28$, $p = 0.012$, $d = 0.13$); informative use, $F(1, 1462) = 9.22$, $p = 0.002$, $d = 0.16$); hedonistic use, $F(1, 1462) = 52.84$, $p < 0.001$, $d = 0.38$); and utilitarian use, $F(1, 1462) = 39.10$, $p < 0.001$, $d = 0.33$). As can be observed, the size of the effect of the gender variable was between minor and small (d <0.20), except in hedonistic and utilitarian use, where it was between small and medium (0.20 and 0.50). In Figure 2, which shows the averages of these two ICT uses, we see that hedonistic use is more frequent in men and utilitarian use is more frequent in women.

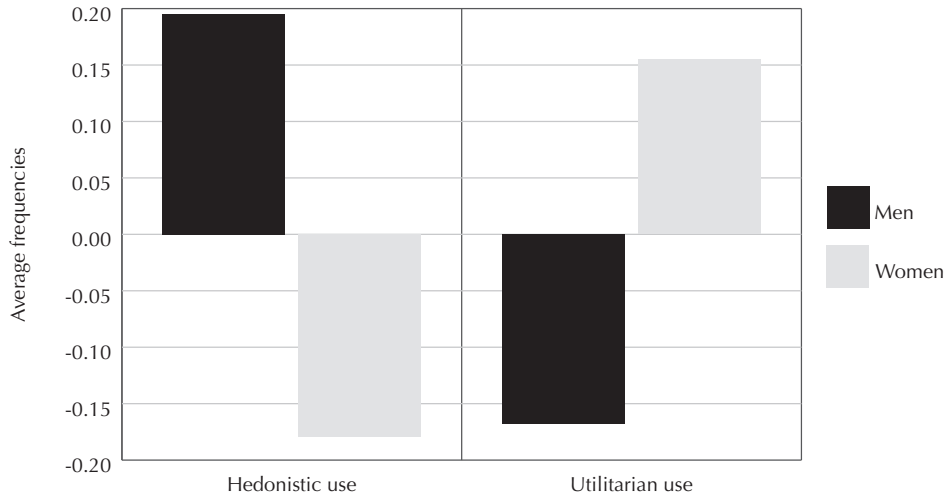

Figure 2. Average frequencies (in *z* score) for hedonistic and utilitarian uses of ICTs according to gender.
Source: Prepared by the authors.

We also observed a multivariate effect of socioeconomic status, $F(8, 2904) = 2.406$, $p = 0.014$, $d = 0.17$). Subsequent trend analyses only showed a significant linear trend in informative use, $F(1, 1455) = 7.40$, $p = 0.007$, $d = 0.14$) and a quadratic trend in hedonistic use, $F(1, 1455) = 4.37$, $p = 0.037$, $d = 0.11$). Figure 3 shows that the frequency of informative use of ICTs tends to increase slightly as the socioeconomic status rises. It also indicates that, as the SES increases, the frequency of hedonistic use tends to grow slightly and then decline. However, with both types of use, the observed trends are minor to small (d <0.20).

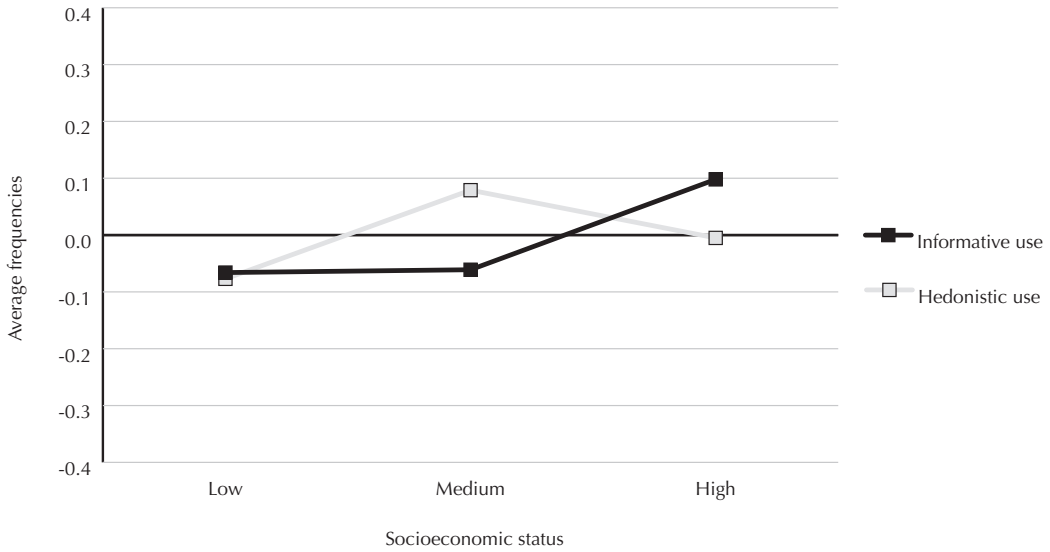

Figure 3. Average frequencies (in *z* score) of informative and hedonistic uses of ICTs according to SES.
Source: Prepared by the authors.

Lastly, a multivariate effect was observed according to age, $F(12, 3868.38) = 4.69$, $p < 0.001$, $d = 0.23$). The trend analyses revealed significant effects of age on the communicative and informative uses of ICTs. In communicative use we observed an effect that was linear ($F(1, 1465) = 6.29$, $p = 0.012$, $d = 0.13$), quadratic ($F(1, 1465) = 13.07$, $p < 0.001$, $d = 0.19$), and cubic ($F(1.1465) = 6.81$, $p = 0.009$, $d = 0.14$). Although none of these three trends has a size of effect greater than 0.20, the quadratic trend seems to predominate (d = 0.19). Consequently, Figure 4 shows a slight tendency towards a higher frequency of communicative use of ICTs among the youngest subjects (18 to 23), a trend that is then reversed at ages above 23. Meanwhile, an increasing linear tendency was observed in informative use ($F(1, 1465) = 19.10$, $p < 0.001$, $d = 0.23$), indicating that the older the participant is, the greater the informative use of ICTs tends to be. This trend has a magnitude between small and medium.

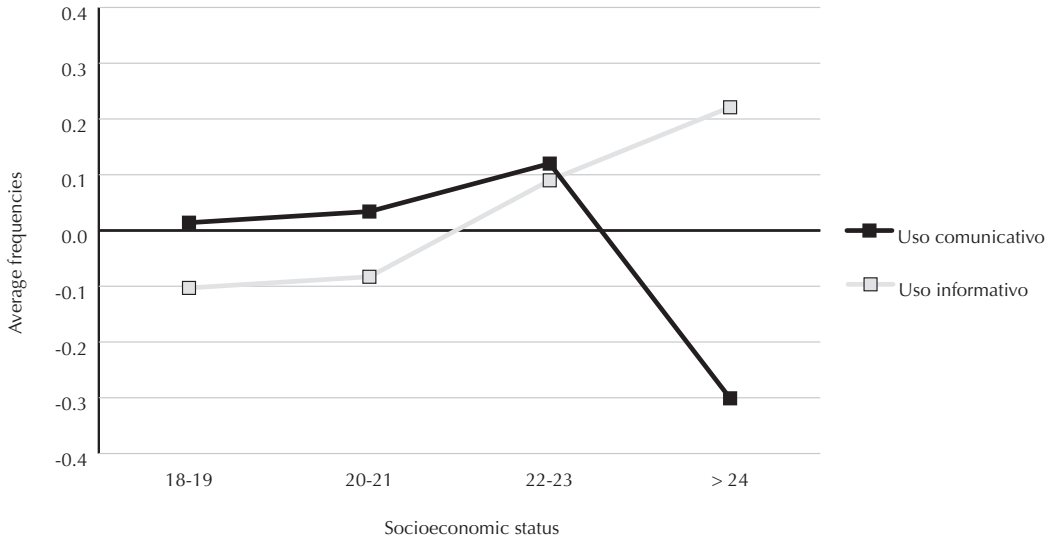

Figure 4. Average frequencies (in *z* score) of communicative and informative uses of ICTs according to age.
Source: Prepared by the authors.

Conclusions

This study allowed us to expand the characterization of ICT uses by university students who are in the stage of development known as EA (Arnett, 2014). In terms of technological resources, we showed that students have almost universal access to computers, internet, and smartphones, access that was significantly higher than that among the general population of Chile. In addition, while students demonstrated comparatively higher use of ICTs to conduct activities related to searching for information, review of text- and multimedia-based content, and online communication and social media, the general population showed comparatively greater use of ICTs to make calls by computer and record and upload photos, audio, or videos to the web.

The results also show that Chilean university students use ICTs more than seven hours a day on average, a much higher level than that observed among European university students (Tondeur et al., 2016) and closer to the levels shown by students in the Middle East (Alothman et al., 2017). The time of use of ICTs may be related to what Coyne et al. (2013, 2014) state regarding the search for independence within the tasks of autonomy of EA. However, the large amount of time for ICT use each day reported by Chilean university students could indicate a greater search for independence compared with university students from other countries, who may have been able to resolve the problem of independence in a different manner. Additionally, the search for independence through the use of ICTs could be strengthened by the digital immersion of current university students at an early age, as most of them were exposed to mass use of ICTs during their time at school (Donoso, 2010; Toro, 2010).

Four dimensions were found that underlie the frequency of ICT use in the 12 activities studied, namely communicative, informative, hedonistic, and utilitarian uses. Although these dimensions consider the types of uses proposed by Van Deursen and Van Dijk (2014), these dimensions group activities that have different purposes. For example, online buying and selling and voice communication activities using a computer are grouped in the same dimension. This regrouping of activities may reflect that certain activities that are traditionally considered to be of different kinds are related in a different way in the population of emerging adults at university, an aspect into which further study should be conducted subsequently.

From a psychological perspective, emerging adults use digital technologies to satisfy their needs for autonomy, identity, and intimacy (Coyne et al., 2013, 2014). In this regard Padilla-Walker (2007) argues that emerging adults use ICTs frequently to search for information, which is associated with meeting the need for autonomy, and they use social media to fulfill their desires for identity. The results of this study confirm the high frequency of activities related to searching for information and the use of social media. In this light, intensive use of social media could be related to the fortification of social and family support (Arnett & Schwab, 2012; Mazzoni & Iannone, 2014; Wang, Tchernev, & Solloway, 2012).

On the other hand, and in relation to tasks of autonomy, the results on hedonistic use, mainly on the part of men, could be linked to the increase in independence levels, particularly, in the rise in the use of ICTs to carry out ludic activities (playing) and recreational activities (listening to music and watching movies). This result corroborates what was found by Padilla-Walker et al. (2010) regarding the use of games and it broadens the notion of ludic use by adding other entertainment activities to games, such as listening to music and watching movies and/or television. However, no significant differences are observed when comparing students' use of ICTs to play with that of the general population, which would seem to indicate that, at least in using ICTs to play, emerging university adults behave similarly to the rest of the population.

One interesting result reveals that as the socioeconomic status of the students increases there is a tendency for higher informative use of ICTs. This trend is not observed in communicative, hedonistic, or utilitarian ICT use. The need to use ICTs to search for information among the higher social classes may be related to the benefits that can be obtained with access to more information, which would confirm what was suggested by Pearce and Rice (2013) and Hargittai and Hinnant (2008) in terms of people with greater cognitive, social, and economic resources benefitting more from ICTs. Although these results are interesting, the study does not identify differences in the use of ICTs between socioeconomic levels, which partly contradicts differentiated use based on cultural capital (Tondeur, Sinnaeve, Van Houtte, & Van Braak, 2010) and indicates more or less homogeneous use of ICT by students of different SES.

In the particular case of Chile, these results can be explained by the almost universal access to and frequent use of ICTs by the participants in this study when they were of school age, creating appropriate conditions for the development of ICT skills, a key element to ensure their use during adulthood (Bobkowski & Smith, 2013).

Another interesting result of this study is that utilitarian use of ICTs is more frequent among women, that is, the use of different ICT tools such as email, tools to record and edit videos, computer telephony, and use of ICT for make online purchases by computer. This result could indicate a more utilitarian concept of ICT on the part of women, where different activities using ICTs are not independent of each other. This hypothesis must be proven in subsequent studies.

This study also showed that informative use of ICTs tends to increase as age rises. This result is reasonable considering the university student status of the participants and the relevance of information management in their professional training. On the other hand, it is surprising that the trend in communicative use decreases so dramatically after the age of 24, considering that we observed an upward trend in this use from 18 to 23.

This could also be related to the specific tasks to be carried out in the sub-stages of EA outlined by Tanner and Arnett (2009), since in the first sub-stage, there is still a relationship of strong dependence on the parents and the social support network begins to expand, which would enhance the communicative use of ICTs. Although this appears to be reasonable, the steep decline observed after 24 is not explained, since this use would be expected to maintain an upward trend or, at least, maintain the frequency. These results could indicate a concentration of communicative use of ICTs in the first sub-stages of the EA, since in sub-stage 3, the subjects should begin to assume the roles inherent to the adult stage. This hypothesis must be tested with more specific studies, since this research does not provide direct evidence in this regard.

Lastly, hedonistic and utilitarian use of ICTs does not vary according to age. This result is surprising, since as age increases it would have been expected that hedonistic use would decrease and utilitarian use would increase. In the case of hedonistic use, this could be explained by the continuation over time of certain characteristics of initial emerging adulthood. This interest is enhanced by an exponential offer of multimedia content at a low price. It is likely that the lack of correlation between age and utilitarian use is due to the fact that, as measured in this study, this use includes a broad spectrum of activities forming a range of nonspecific tools.

Although the sample size used is large and the geographical origin of the participants is diverse, the intentional nature of the sampling prevents the statistical representativeness from being determined and, therefore, the degree of generalization of these results with respect to the population of university students in Chile.

Although this study enabled us to look more deeply at the characterization of ICT use in emerging adults at university, this characterization is not necessarily applicable to emerging adults who are not university students. Another limitation is created by the amount and types of activities that were presented as reactants, since these do not provide further explanation of the intentionality of the use of ICTs. This restricts the generalization of the conclusions and opens up new challenges to identify intentionality in the use of ICTs and their relationship with identity, instability, optimism, and possibilities, being "self focused" and feeling "in-between", which characterize EA.

On the other hand, there are aspects that were measured in the series of instruments of the overall project that were not included in this paper, as they were beyond its objectives. In this regard, in future studies it would be interesting to link the use of technology with the degree being studied, ethnicity, negative emotional experiences, alcohol and drug use, or different aspects of mental health. In addition to the above, new studies in the area should include emerging adults of various socioeconomic statuses and with different working conditions.

The original article was received on March 26th, 2019
The revised article was received on August 5th, 2019
The article was accepted on September 24th, 2019

References

Adimark. (2000). *El nivel socioeconómico ESOMAR: Manual de aplicación*. Retrieved from https://www.microweb.cl/idm/documentos/ESOMAR.pdf

Alothman, M., Robertson, J., & Michaelson, G. (2017). Computer usage and attitudes among Saudi Arabian undergraduate students. *Computers & Education, 110*, 127-142. https://doi.org/10.1016/j.compedu.2017.02.010

Arnett, J. (2014). *Emerging adulthood: The winding road form the late teens through the twenties* (Second ed.). New York: Oxford University Press.

Arnett, J. & Schwab, J. (2012). *The Clark University poll of emerging adults: Thriving, struggling, & hopeful.* Worcester, MA: Clark University.

Bobkowski, P. & Smith, J. (2013). Social media divide: Characteristics of emerging adults who do not use social network websites. *Media, Culture & Society, 35*(6), 771-781. https://doi.org/10.1177/0163443713491517

Claro, M., Preiss, D., San Martín, E., Jara, I., Hinostroza, J. E., Valenzuela, S., ... Nussbaum, M. (2012). Assessment of 21st century ICT skills in Chile: Test design and results from high school level students. *Computers & Education, 59*(3), 1042-1053. https://doi.org/10.1016/j.compedu.2012.04.004

Coyne, S., Padilla-Walker, L., & Howard, E. (2013). Emerging in a digital world: A decade review of media use, effects, and gratifications in emerging adulthood. *Emerging Adulthood, 1*(2), 125-137. https://doi.org/10.1177/2167696813479782

Coyne, S., Padilla-Walker, L. M., & Howard, E. (2014). Media uses in emerging adulthood. In J. J. Arnett (Ed.), *The Oxford handbook of emerging adulthood* (Vol. 1). Oxford: Oxford University Press.

Domínguez, S. (2012). Propuesta para el cálculo del Alfa Ordinal y Theta de Armor. *Revista de Investigación en Psicología, 15*(1), 213-217. https://doi.org/10.15381/rinvp.v15i1.3684

Donoso, G. (2010). Enlaces en el sistema escolar chileno: Evolución de sus cifras. In A. Bilbao & A. Salinas (Eds.), *El libro abierto de la informática educativa: lecciones y desafíos de la Red Enlaces* (pp. 138-149). Santiago de Chile: Centro de Educación y Tecnología - LOM Editores.

Hargittai, E. & Hinnant, A. (2008). Digital inequality: Differences in young adults' use of the Internet. *Communication Research, 35*(5), 602-621. https://doi.org/10.1177/0093650208321782

Hargittai, E. & Walejko, G. (2008). The participation divide: Content creation and sharing in the digital age. *Information, Communication & Society, 11*(2), 239-256. https://doi.org/10.1080/13691180801946150

Hinostroza, J. E., Matamala, C., Labbé, C., Claro, M., & Cabello, T. (2014). Factors (not) affecting what students do with computers and Internet at home. *Learning, Media and Technology, 40*(1), 43-63. https://doi.org/10.1080/17439884.2014.883407

Horn, J. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika, 30*(2), 179-185. https://doi.org/10.1007/bf02289447

Kimbrough, A., Guadagno, R., Muscanell, N., & Dill, J. (2013). Gender differences in mediated communication: Women connect more than do men. *Computers in Human Behavior, 29*(3), 896-900. https://doi.org/10.1016/j.chb.2012.12.005

Lorenzo-Seva, U. & Ferrando, P. J. (2006). FACTOR: A computer program to fit the exploratory factor analysis model. *Behavior Research Methods, 38*(1), 88-91. https://doi.org/10.3758/bf03192753

Mazzoni, E. & Iannone, M. (2014). From high school to university: Impact of social networking sites on social capital in the transitions of emerging adults. *British Journal of Educational Technology, 45*(2), 303-315. https://doi.org/10.1111/bjet.12026

Muthén, B. & Kaplan, D. (1985). A comparison of some methodologies for the factor analysis of non-normal Likert variables. *British Journal of Mathematical and Statistical Psychology, 38*(2), 171-189. https://doi.org/10.1111/j.2044-8317.1985.tb00832.x

Nelson, L. & Barry, C. (2005). Distinguishing features of emerging adulthood: The role of self-classification as an adult. *Journal of Adolescent Research, 20*(2), 242-262. https://doi.org/10.1177/0743558404273074

Padilla-Walker, L. (2007). Adolescents' developmental needs in relation to media use. In J. J. Arnett (Ed.), *Encyclopedia of children, adolescents, and the media* (Vol. 1) (pp. 2-5). Thousand Oaks, CA: SAGE.

Padilla-Walker, L., Nelson, L., Carroll, J., & Jensen, A. (2010). More than a just a game: Video game and Internet use during emerging adulthood. *Journal of Youth and Adolescence, 39*(2), 103-113. https://doi.org/10.1007/s10964-008-9390-8

Pearce, K. & Rice, R. (2013). Digital divides from access to activities: Comparing mobile and personal computer Internet users. *Journal of Communication, 63*(4), 721-744. https://doi.org/10.1111/jcom.12045

Pinto de la Fuente, M. & González, B. (2016a). *Séptima encuesta de acceso, usos y usuarios de Internet.* Santiago de Chile: Ipsos Chile.

Pinto de la Fuente, M. & González, B. (2016b). *Séptima Encuesta de acceso, usos y usuarios de Internet: base de datos*. Retrieved from http://www.subtel.gob.cl/wp-content/uploads/2015/04/BASE_VII_ENCUESTA_INTERNET_2015.sav

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

Tanner, J. & Arnett, J. (2009). The emergence of emerging adulthood. The new life stage between adolescence and young adulthood. In A. Furlong (Ed.), *Handbook of youth and young adulthood: New perspectives and agendas* (pp. 39-45). London: Routledge.

Tondeur, J., Sinnaeve, I., van Houtte, M., & van Braak, J. (2010). ICT as cultural capital: The relationship between socioeconomic status and the computer-use profile of young people. *New Media & Society, 13*(1), 151-168. https://doi.org/10.1177/1461444810369245

Tondeur, J., van de Velde, S., Vermeersch, H., & van Houtte, M. (2016). Gender differences in the ICT profile of university students: A quantitative analysis. *Journal of Diversity and Gender Studies, 3*(1), 57-77. https://doi.org/10.11116/jdivegendstud.3.1.0057

Toro, P. (2010). Enlaces: contexto, historia y memoria. In A. Bilbao & A. Salinas (Eds.), *El libro abierto de la informática educativa: lecciones y desafíos de la Red Enlaces* (pp. 38-50). Santiago de Chile: Centro de Educación y Tecnología - LOM Editores.

van Deursen, A. J. A. M. & van Dijk, J. A. G. M. (2014). The digital divide shifts to differences in usage. *New Media & Society, 16*(3), 507-526. https://doi.org/10.1177/1461444813487959

Wang, Z., Tchernev, J. & Solloway, T. (2012). A dynamic longitudinal examination of social media use, needs, and gratifications among college students. *Computers in Human Behavior, 28*(5), 1829-1839. https://doi.org/10.1016/j.chb.2012.05.001