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Variables relacionadas con componentes actitudinales hacia las tecnologías de la información y la comunicación en estudiantes de psicología

Carlos Ossa Cornejo*, Nelly Lagos San Martín**, Carolina Flores Lueg***.
Universidad del Bio-Bio, Chile

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Resumen

A pesar de haber estudios que señalan algunas diferencias actitudinales por parte de estudiantes universitarios hacia el uso de las tecnologías de la información y comunicación (TIC), estos se basan en características sociodemográficas, y muy pocos explican cómo es que se presentan dichas variables relacionadas con las actitudes. El objetivo de este estudio fue describir algunos de los componentes actitudinales hacia las TIC en estudiantes de psicología de seis universidades chilenas, e identificar las diferencias entre dichos componentes según variables demográficas, de uso y de conocimiento. La muestra estuvo compuesta por 184 estudiantes con edades entre 20 y 45 años. Se utilizó el cuestionario de actitudes hacia la informática, que se complementó con preguntas sobre características sociodemográficas, de conocimiento y uso de las TIC. Los resultados señalan una tendencia a manejar niveles medios de conocimiento, así como niveles altos y medios de uso; sobre todo, las actitudes se orientaron hacia aspectos positivos; y se encontró una diferencia significativa entre el nivel de uso y de conocimiento en los componentes de las actitudes, pero no en sexo ni en edad. Estos resultados proyectan la necesidad de mantener una actitud positiva con incorporación activa hacia las TIC cuando de formación en psicología se trata.

Palabras clave: TIC, psicología, actitudes, formación.

Variables related to attitudinal factors towards information and communication technologies in psychology students

Abstract

Although there are studies pointing to some attitudinal differences of university students towards the use of *Information and Communication Technologies* (ICT) based on their socio-demographic characteristics, there is little research regarding how these variables influence the use of ICT in Psychology students. The aim of this study was to describe attitudinal factors towards ICT in Psychology students of six Chilean universities and identify differences in these factors according to demographic characteristics, knowledge and use of ICT. Participants were 184 Psychology students, aged between 20 and 45 years. The instrument used was a questionnaire of attitudes towards computers, complemented with a set of questions on socio-demographic characteristics and on knowledge and use of ICT. Results show a tendency to manage medium levels of knowledge, as well as a high and medium use of ICT. Attitudes were oriented mainly towards positive aspects. A significant difference between the level of use and knowledge in the attitudinal components was found, but not on sex and age. The results of this study pose the need to maintain a positive attitude of actively incorporating ICT in psychological training.

Key words: ICT, Psychology, attitudes, training.

* Avda. Andrés Bello 720, Casilla 447, Chillán, Chile, Fono:+56422463555, cossa@ubiobio.cl

** Avda. Andrés Bello 720, Casilla 447, Chillán, Chile, Fono:+56422463553, nlagos@ubiobio.cl

*** Avda. Andrés Bello 720, Casilla 447, Chillán, Chile, Fono:+56422463491, cflores@ubiobio.cl

Variáveis relacionadas com componentes atitudinais quanto a tecnologias da informação e da comunicação em estudantes de psicologia

Resumo

Embora haja estudos que indicam algumas diferenças atitudinais por parte de estudantes universitários quanto ao uso das tecnologias da informação e da comunicação (TIC), eles se baseiam em características sociodemográficas; poucos explicam como essas variáveis relacionadas com as atitudes são apresentadas. O objetivo deste estudo foi descrever alguns dos componentes atitudinais a respeito das TIC em estudantes de psicologia de seis universidades chilenas e identificar as diferenças entre esses componentes segundo variáveis demográficas, de uso e de conhecimento. A amostra esteve composta por 184 estudantes entre 20 e 45 anos. Utilizou-se o questionário de atitudes com relação à informática, que foi complementado com perguntas sobre características sociodemográficas, de conhecimento e de uso das TIC. Os resultados demonstram uma tendência a manejar níveis médios de conhecimento bem como níveis altos e médios de uso; principalmente, as atitudes foram orientadas a aspectos positivos; constatou-se uma diferença significativa entre o nível de uso e de conhecimento nos componentes das atitudes, mas não em sexo nem em idade. Esses resultados projetam a necessidade de manter a atitude positiva com incorporação ativa quanto às TIC quando de formação em psicologia se tratar.

Palavras-chave: atitudes, formação, psicologia, TIC

INTRODUCTION

Information and Communications Technologies (ICT) are mediating the different developmental processes in the universities, from administrative management to research and teaching, as evidenced in the scientific literature about that topic (Área, 2010; Benavides & Pedró, 2007; Gallardo, Marqués & Bullen, 2015; Onen, 2012; Roig-Vila, Mengual, Sterratino & Quinto, 2015; Yalman & Tunga, 2014). Undoubtedly, the incorporation of these tools into higher education has produced large-scale changes to the point that nowadays some authors point out that we are reaching the birth of a new university (Mas & Tejada, 2013). Its main function is to “train competent subjects to face the complex challenges in culture, knowledge, science, economics and social relations of the XXI century” (Area, 2010: 4).

Inside the current scenario, specifically regarding the academic processes, universities have faced a double challenge. On the one hand, the need of teachers to get acquainted with the ICT tools currently available, in order to incorporate them into their classroom practices and ideally, take advantage of all the potential these resources offer to transform teaching methodologies, making them more pertinent and contextualized. On the other hand, the concern about generating positive and healthy strategies as well as willingness on the part of the students towards these tools, so that they become an important part of their own professional training process and turn into indicators of educational quality (Yalman & Tunga, 2014).

The ICT's that have been incorporated into the educational processes imply a change in the patterns and behaviors

of students with respect to their access to information and knowledge, since it cannot be denied that students have a certain level of skills regarding the use of digital technology.

According to Roig-Vila, Mengual-Andrés, Sterratino & Quinto (2015) in some research on the use of ICT, it is evident that attitudes are a conditioning factor for the integration of these tools, both individually and within the socialization and learning processes. With this in mind, there is the thought that a negative attitude of teachers towards ICT could result in the use of those tools under traditional teaching models, thus having a low impact on teaching methodologies and causing teachers (and students) to perceive a low efficacy of these resources in the teaching process. Consequently, ICT's would be evaluated in a biased way by both educational actors, which would bring about dire consequences for their use, especially if negative comments from teachers are generated (Bolaños-Medina & Isern, 2012)

Attitudes towards ICT and academic training

Regarding the impact of ICT use on the part of university students some studies show (Benavides & Pedró, 2007; Careaga, Avendaño & Careaga, 2007) that these tools can stimulate the educational process by playing a complementary and supportive role for cognitive work in learning. If they are adequately used, one could, with greater efficacy and quality, “design, create, investigate, argue and reflect on the information that is being learnt” (Ossa, 2012: 33).

On the other side, many authors in several places of the world have studied the relationship between attitudes towards ICT and the effective use of these tools. However, these

studies have focused on defining the levels of self-efficacy, anxiety towards computers, attitudes and some demographic variables (such as gender) in addition to establishing certain interactions between these very characterization scores. (Bolaños-Medina & Isern, 2012; Durndell y Haag, 2002; Hergatt-Huffman, Whetten & Huffman, 2013; Muñoz, 2006; Pamuk & Peker, 2009).

With respect to the above, a research carried out by Durndell y Haag (2002) with Eastern Europe students is highlighted, whereby, the authors found a relationship between high self- efficacy towards computers, low anxiety, positive attitudes and prolonged use of the Internet. In addition, they found differences by gender, since the report by male students tended to show a greater self-efficacy, better attitude and use, and a lower anxiety towards computers than female students do.

Other studies performed in Turkey, Europe and America, have found similar results with respect to attitudes, self-efficacy and anxiety, but they have not reported a clear relationship between gender and self- efficacy or ICT use and the Internet. And even less, a relationship explicable for belonging to a particular gender, or for cultural factors or exposure to technology has been found (Hergatt-Huffman, Whetten & Huffman, 2013; Önder, Çelik & Silay, 2011). There is also no consensus about the influence of variables such as the level or grade attended by the students, their socioeconomic level or age, even when some of these factors would indeed influence the attitudes and use of ICT in university students (Önder, Çelik & Silay, 2011; Pamuk & Peker, 2009).

On the other hand, it is important to highlight a study by Sariçoban (2013) with English language translation students that focused on evaluating their attitudes towards ICT, measuring emotional components, perceived usefulness, perceived control and intentional behavior. The results of this research show the existence of a high positive attitude towards the use of computers, and a meaningful relationship between that positive attitude and intentional behavior, which would suggest that the positive perception towards ICT could lead to a higher use thereof. However, the study also shows a negative relationship between these variables and the perceived usefulness, which would indicate that in this case, even though there was a positive attitude or intention to use them, ICT could be regarded as unhelpful for learning.

Finally, a study by Onen (2012) highlights, among the results found, that students from the educational area showed a positive and meaningful relationship between beliefs they had about education and attitudes towards the use of Internet and computers. This could indicate that

the fact of having a progressive or updated conception on this field, could improve students' willingness to use ICT.

Assessment of ICT in psychology students

The studies focused on the relationship psychology students have with ICT and informatics are more limited if they are compared to the ones performed on students of other disciplines like, for example, pedagogy or nursing. A study by Capozza, Falvo, Robusto & Orlando (2003) analyzes the existence of a positive view, in general, in the psychology field, about the use of Internet as a work resource, since it allows establishing a better communication, developing a deeper knowledge, sharing information in a more democratic way and achieving a better quality of life. These authors suggest the existence of two attitudinal components: an emotional one, related to sensations produced in the use of computer tools, and an evaluative one, related to expectations and judgments about their use.

On the other hand, a pioneer study conducted in Chile (López-Mena, 2001), aiming to analyzing the possible incorporation of the technological tools into the training of psychologists, showed some difficulty and resistance both from students and teachers. They found it difficult to incorporate ICT into the formative process, since these resources seemed to be diametrically opposite to the training of individual abilities and human interaction, conceived as typical activities of the professional duty. This perception would be a factor that could complicate the incorporation of ICT into the pedagogic work with students, since it corresponds to a career that was essentially of "chalk and blackboard" (p. 10), referring to the traditional instructional materials.

Another study carried out by Ahumada (2004) addresses the use and value of technologies in psychology students and analyzes the value of a virtual learning resource in Chilean students of that discipline. This author evaluated the use of Internet on the students' learning process, based on the assessment of how and how much they used a web site as support for the development of a course on social psychology. The study's results pointed out that these students appreciated the technological resource, but mostly in terms of its use to check the email and communication softwares, and secondly, as a support resource for learning, due to the possibility of having access to information. There were no differences between men and women, although a statistically significant difference was established on the use of this resource between the beginning and end of the experience.

Subsequently, the results of a study performed by Muñoz (2006), showed that the possession of computing equipment

and the use of technological tools is relatively high in the psychology students assessed by the author. However, the use of these resources would be mainly centered on study support and entertainment activities, although the last ones to a lesser extent. The positive aspects pointed out by students about the use of ICT were related to the time and money economy to get access to and approaching their teachers and peers' opinions. On the other hand, the disadvantages that these students perceived referred to implementation difficulties—amount of equipment and network slowness—although they also referred to the lack of creativity on the part of the teachers in the pedagogical use of these tools.

Finally, it can be pointed out that in a more recent study conducted by Ossa (2012) some conceptions of psychology students about informatics as a work tool were evaluated through interviews with students in the last years of training. The study shows the existence of an instrumental appraisal of ICT, an aspect of great importance, since it supports the future psychologists' perception about the use of technological tools in its formative field. That is to say, students had a reductionist view about informatics, since for them it just represented a device that allows processing information, but it was not regarded as a possibility and/or a better integration alternative of the technologies into their disciplinary field.

Based on the above findings, it is relevant to make students and professionals aware of the need to approach ICT in their professional training. On the one hand, these tools have not only generated a series of economic, cultural and historic transformations at a social level, but they have also been incorporated into the administrative and academic processes of higher education institutions. Therefore, they are expected to be implemented into teaching from a pedagogical dimension.

Even though the previously mentioned researches show that ICT are considered a useful tool for communication and support in the formative process, there is some reticence to consider them as a support resource in the professional field. A possible explanation is that there is certain ambivalence in the attitudes towards these tools, which might arise from their personal beliefs about them (Ossa, 2012).

Based on the above, the main purpose of this study was to describe the level of attitudes, both in their affective and evaluative components, that psychology students of higher grades (third and fourth year) show towards ICT in their formative process. The second aim was to identify differences related to demographic variables like age and gender, as well as knowledge and use of ICT, in each of these attitudinal components.

METHOD

Design

The design of the study was non-experimental, descriptive and comparative (*ex post facto*), focused on analyzing the attitudes of psychology students in Chilean universities towards information technology, and in identifying the differences in such attitudes regarding demographic factors, and of use and knowledge of ICT.

Participants

Participants in the study were 184 psychology students enrolled in third and fourth year of university from six higher education institutions located in Santiago of Chile. Sampling was intentional and non-probability. Two of the institutions were public universities (74 students), other two were private traditional universities (72 students), and two more were relatively new private universities, with less than 15 years of operation (38 students). From the point of view of gender, 54% were women and 46% men, aged 25 to 40 years ($M=22.8$, $SD=.986$).

Instrument

The instrument used consisted of four sections: The first one included questions on demographic data such as study course, age and gender; a second section had four closed questions based on Hackos and Redish' typology (1988), two of them about the level of knowledge on informatics and the other two about the perceived use of information technology. These four questions were answered on a likert scale with four alternatives (nothing/ little, low, medium, and high). One open question about the use given to informatics tools was also included.

The third part of this instrument was an adaptation of Capozza's et al.(2003) Attitude Questionnaire, which involved the measuring of the affective and evaluative attitudinal components. Five pairs of concepts for each component were taken into account, using a semantic differential strategy, where the participant was asked to organize concepts related to both attitudinal components. The affective component was related to the concepts agreeable/ disagreeable, sad/ happy, uncomfortable/comfortable, pleasant/ unpleasant, tense/ calm; while the evaluative component was related to the concepts harmful/ beneficial, artificial/ natural, empty/ complete, non useful/ useful, heavy/ light.

The general instruction to complete the last part of the questionnaire implied the valuation of the statement. "For me, working with informatics tools is an experience...", where the participants had to select a value from 1 to 7 for

each pair of concepts, a scoring ranging from a negative valuation located on the left side of the scale (value 1) to a positive valuation located on the right side (value 7).

In Capozza's et al (2003) study the scales show a suitable reliability level, with an alpha of .72 for the affective component, and .76 for the evaluative component, whereas in the present study a higher reliability coefficient on the affective attitude component ($\alpha = .884$) and on the evaluative component ($\alpha = .880$) were found.

Procedure

First, a meeting with the deans of the Psychology programs of each institution took place, in order to explain to them the objective of the study, and agree on the time and place for application of the questionnaire. This issue was also communicated to a member of the academic staff, who would allow a few minutes of his class for the administration of the instrument. Following this, a meeting was held with the students, where they were told that their participation was volunteer and anonymous, they were asked to sign the consent and given instructions on how to fill it in. The application of the instrument took place in each university, lasting about 20 minutes.

Data analysis

Data were transferred to a database of the SPSS v. 20. Statistics program and a descriptive analysis was performed through distribution measures (central tendency and dispersion). In addition, Cronbach's alpha coefficient was used to measure the reliability level of the attitudinal components. Lastly, Student's *t* test and One-way Anova were used to determine the differences regarding the demographic factors, as well as the variables of knowledge and use of ICT,

Ethical considerations

A written communication was sent to each institution with the purpose of informing about the research objectives and asking for their approval. Subsequently, when the instruments were applied, a written consent was attached to each test, in order to inform about the objective of the study and the instrument and emphasize that their participation was volunteer.

RESULTS

Regarding the general knowledge and frequency level of ICT use, different results were found (see Table 1). The knowledge level perceived (measured from nothing/little to high options), corresponds mostly to the option medium knowledge (70%), followed by low (17%), and high (13%),

without any answer on the nothing/little option. As regards the use or frequency level on the ICT utilization (using the same categories), it was noticed that the majority indicated a high use (47%), followed by medium (31%), and to a lesser extent, the categories low and nothing/little use, which as a whole obtained the remaining 22%.

Table 1

Percentages of knowledge level and frequency of use of ICTs (N=184)

Knowledge level			Frequency of use	
Nothing/ little	0 %	M ¹ = 0 % F = 0 %	5 %	M ¹ = 2.5 % F = 2.5 %
Low	17 %	M = 5 % F = 12 %	17 %	M = 8 % F = 9 %
Medium	70 %	M = 31 % F = 39 %	31 %	M = 12 % F = 19 %
High	13 %	M = 9 % F = 4 %	47 %	M = 23.5 % F = 23.5 %

1. M= Male; F= Female

Additionally, regarding knowledge level, but not use, an irregular distribution between men and women is noticed. In knowledge level, women show a tendency to predominate over men in the low and medium knowledge categories, while men show a greater percentage in high knowledge. As regards the use, only a marked difference is noticed in the medium level of use where men predominate over women.

Concerning age, there was a wider distribution of knowledge in the medium level, with a greater tendency between the age ranges of 21 to 25 years, followed by the 26 to 30 years range. Regarding ICT use, a more homogeneous distribution is observed, where the high level of use predominates in the 21 to 25 years age range (See Table 2).

With respect to the descriptive analysis of attitudes, it is noticed that the affective component shows an average value close to the positive descriptors ($M=5.3$, $SD= 1.06$). Among these, the best rated is the pair disagreeable/ agreeable (tendency to agreeable), while the component sad/happy is rated with a score close to the middle point ($M=4.99$; $SD= 1.190$). Another aspect to highlight is that the pairs tense/ calm and sad/happy, are located close to the middle point of the options (Mode= 4)

On the other side, the evaluative component shows an average also close to the positive descriptors ($M=4.9$, $SD=1.20$). The positive valuation of the pair beneficial/ harmful stands out with a tendency towards beneficial (represented by the Mode=7), and as a less valued aspect, is the pair heavy/light with a valuation towards the middle point according to its average and mode (See Table 3).

Table 2
Knowledge levels and ICT use regarding age (N = 184)

	Knowledge				Use			
	Nothing/ little	Low	Medium	High	Nothing/ little	Low	Medium	High
Below 20	0	1	7	3	1	2	4	5
21 a 25	0	13	81	12	4	10	31	56
26 a 30	0	12	24	4	5	6	15	15
31 a 35	0	2	6	3	3	3	2	6
Over 36	0	4	8	4	0	6	4	6
N	0	32	126	26	13	27	56	88

Table 3
General descriptive data of the affective and evaluative components of attitude towards ICT (N = 184)

	Affective Components					Evaluative Components				
	Disagreeable/ Agreeable	Sad/ Happy	Uncomfortable/ Comfortable	Unpleasant/ Pleasant	Tense/ Calm	Harmful/ Beneficial	Artificial/ Natural	Empty/ Complete	Non use/ Full-use	Heavy/ Light
Mean	5.66	4.99	5.55	5.22	5.01	5.45	4.86	4.91	4.80	4.80
Mode	6	4	5	5	4	7	5	4	5	4
Stand. Deviat	1.279	1.19	1.172	1.296	1.533	1.386	1.834	1.342	1.345	1.477
Minimum	1	1	1	1	1	1	1	1	1	1
Maximum	7	7	7	7	7	7	7	7	7	7

Regarding how the assessment of attitudes towards ICT is distributed in psychology students in relation to the demographic, knowledge and use variables, it is generally noticed that there is a more positive attitude in the affective component (AC) than in the evaluative one (EC) (See Table 4). With respect to gender, a very similar valuation between men and women can be seen, while regarding age, an increasing valuation is seen in both attitudinal components in relation to increase of age, except for the over 36 years age range. Finally, regarding use, it can be seen that the greater the use, the higher the valuation in both components.

In addition to the previously mentioned, there was a search for existing differences in the sample due to demographic variables, ICT use and knowledge level, as well as for affective and evaluative components of attitude. To achieve this, first, the normality characteristics of the sample for both components were analyzed, measured with the Kolmogorov-Smirnov statgraphics (K-S) usually used for this analysis. A normal distribution for both the affective ($z=.900$; $p=.393$) and the evaluative components ($z=.818$; $p=.515$) was found.

In order to evaluate the differences in the gender variable, the Student's *t* statistic was applied for independent samples, considering the values for the men and women's groups.

Table 4
Valuation of attitudes distribution according to demographic, knowledge and usage variables (N=184)

	Attitudes	
	CA average	CE average
<i>Gender</i>		
Male	5.28	4.91
Female	5.29	4.89
<i>Age</i>		
Below 20	5.1	4.7
21 to 25	5.25	4.79
26 to 30	5.36	5.07
31 to 35	6.17	6.02
over 36	4.98	4.78
<i>Knowledge level</i>		
Nothing/little	0	0
Low	4.7	4.2
Medium	5.34	4.96
High	5.78	5.48
<i>Use level</i>		
Nothing/little	4.46	4.18
Low	4.83	4.34
Medium	5.49	5
High	5.41	5.12

Results show that there are no significant differences due to gender in the attitudinal affective component ($M_m = 5.28$, $DS=0.97$; $M_f = 5.29$, $SD = 1.14$; $t(2,182) = -.082$; $p = .935$), nor in the evaluative component ($M_m = 4.91$, $SD = 1.14$; $M_f = 4.89$, $SD = 1.27$; $t(2,182) = .087$, $p = .931$).

Regarding the variables age, knowledge level, and frequency of use, the one-way ANOVA statistic test was applied, since these variables allowed the coexistence of three or more groups. Table 5 shows the ANOVA values and their significance level.

As shown, there are no significant differences in age (age range) on the affective component ($M_1 = 5.14$; $M_2 = 5.25$; $M_3 = 5.36$; $M_4 = 6.17$; $M_5 = 4.97$; $F(4,179) = 1.712$; $p = .149$), nor in the evaluative component ($M_1 = 4.69$; $M_2 = 4.79$; $M_3 = 5.07$; $M_4 = 6.02$; $M_5 = 4.77$; $F(4,179) = 2.212$; $p = .080$).

For its part, regarding the knowledge level (knowledge levels), there are statistically significant differences in the affective component ($M_1 = 4.69$; $M_2 = 5.33$; $M_3 = 5.78$; $F(2,181) = 8.121$; $p = .000$); also there are significant differences as regards this variable in the evaluative component ($M_1 = 4.20$; $M_2 = 4.96$; $M_3 = 5.48$; $F(2,181) = 8.686$; $p = .000$).

Based on a post-hoc analysis, using the Bonferroni correction, it was intended to determine which groups

presented these significant differences, finding that in the affective component, these were present between the low knowledge and the medium and high knowledge groups ($p = .006$ y $p = .000$ respectively), but there were no significant differences between these last two ones ($p = .153$). Regarding the evaluative component, a significant difference was also found between the low knowledge group and the medium and high knowledge groups ($p = .004$ y $p = .000$), but there were no differences between these last ones either ($p = .152$).

Finally, as regards the ICT use, significant differences were also found in the affective component ($M_1 = 4.46$; $M_2 = 4.83$; $M_3 = 5.48$; $M_4 = 5.41$; $F(3,180) = 5.344$; $p = .002$), as well as in the evaluative component ($M_1 = 4.16$; $M_2 = 4.34$; $M_3 = 5.01$; $M_4 = 5.12$; $F(3,180) = 4.800$; $p = .003$). From a post-hoc analysis using Bonferroni correction, it was found that there were differences in the affective component between the nothing/little use group, and the medium and high use groups ($p = .024$ y $p = .035$ respectively) but there were no differences with the low use group ($p = 1.00$). In addition, there were differences between the low use group, with the medium and high use groups ($p = .030$ y $p = .043$), although there were no statistically significant differences between the medium and high use groups ($p = 1.00$). Moreover, in

Table 5
ANOVA values of the studied variables (N=184)

Groups/variable	Affective Component			Evaluative Component		
	M(SD)	F	p	M(SD)	F	P
<i>Age</i>						
Below 20	5.14 (.97)	1.712	.149	4.69 (1.16)	2.118	.08
21-25	5.25 (.95)			4.79 (1.14)		
26-30	5.36 (1.23)			5.07 (1.26)		
31-35	6.17 (.76)			6.02 (0.74)		
over 36	4.97 (1.28)			4.77 (1.52)		
<i>Knowledge level</i>						
Nothing/little	-			-		
Low	4.69 (.84)	8.121	.00	4.2 (1.02)	8.686	.00
Medium	5.33 (1.08)			4.96 (1.18)		
High	5.78 (.86)			5.47 (1.25)		
<i>Use level</i>						
Nothing/little	4.46 (1.10)			4.16 (1.25)		
Low	4.83 (.89)	5.344	.002	4.34 (1.15)	4.8	.003
Medium	5.48 (.90)			5.00 (1.02)		
High	5.41 (1.13)			5.12 (1.27)		

Note: (*) significant correlation $p < .05$

the evaluative component, there were significant differences only between the low and high use groups ($p = .011$), but not between the remaining categories.

DISCUSSION

Results show that in the analyzed sample ($N=184$), a high percentage of psychology students state having a low or medium knowledge level about ICT functionality. That is to say, there are many students who declare being acquainted to some extent with software and hardware and knowing how to use them on daily tasks, but they do not know about their functioning in depth, nor about their construction. Regarding the frequency of use of these tools, it is important to point out two aspects: on the one side, that the majority of young people indicate they use these tools most of the time during the week and, on the other side, that those who use technology more frequently have a medium or high knowledge level of it. According to this, these students would be on the *competent users*' level (Hackos & Redish, 1998), that is to say, on a level implying certain security in order to develop several processes, although they still lack some learning in order to acquire an expert knowledge on the mentioned tools.

These data confirmed that ICT are part of youth's life, both in their roles as digital citizens and students, even though it is at a moderate knowledge level. This aspect should be taken into account in the graduates' profiles of the institutions that train psychologists in Chile. Moreover, students with medium and high knowledge declare a more positive valuation of these tools and a more noticeable willingness towards them as compared with students in the nothing/little and low knowledge categories, which would show the relevance of generating greater quantity and quality on ICT use in the training of the future psychologists.

The fact that attitudes from psychology students towards ICT are positive should be highlighted, since the ideas of agreeable and beneficial are emphasized as descriptors, which would allow them to promote the use and increase their knowledge as users. It must be understood that, in order to judge in a satisfactory way a work with ICT, it should not only be experienced as pleasant or comfortable (affective component), but also be perceived as useful and beneficial (evaluative component), that is to say, there must be a valuation of both dimensions simultaneously. This is related to the findings of other studies (Durndell & Haag, 2002; Sariçoban, 2013), which suggest the need for technological resources to be used as support for learning in order to take advantage of the perceived strengths and promote a positive attitude towards them.

Likewise, the fact that significant differences in the attitudinal components were found is highly relevant, since this would mean that a greater knowledge level and frequency of use of ICT could be the base for developing a positive attitude towards them. Also, due to the fact that low and high levels in both variables have an impact on these two attitudinal components, it is important that teachers incorporate the technologies into the formative processes. Particularly, this is pertinent in psychology, since it is noticed that a greater utilization of these resources leads to a better valuation of the potential they can offer and to a positive disposition towards them (Ahumada, 2004; Onen, 2012).

It is a fact that those students who know little about ICT and give less use to these tools show lower levels of positive attitudes than those who know more and use them more frequently. This should be used as a guideline so that the insertion of ICT into the curriculum become a reality more than just a promise, and thus be lined up with the current high education policies in this field (Área, 2010).

This background allows anticipating that, in order to promote a better disposition and valuation of technological resources from psychology students, it is necessary to acquire a greater knowledge level about the support these tools provide to their training. This goal could be achieved by increasing the number of activities to use them, since this frequent contact also benefits the positive attitude towards them. That implies, on the other hand, that it is necessary to analyze the level of resource implementation such as equipment, nets, institutional software and training programs, an aspect that was not considered in this study, but could be investigated later.

In addition, it is necessary to think deeply about the difficulty that psychology teachers could have to incorporate and use these resources into the formative processes, since there is a traditional belief that this discipline has a distant and mistrustful relationship regarding ICT (López-Mena, 2001; Ossa, 2012). However, it is necessary to change those attitudinal logics and beliefs at this level, in order to make a change in the didactic and curricular approaches, so that both, trainee psychologists and students from other disciplines, can see themselves favored by the educational and professional potential these tools provide, considering that current society imposes this challenge.

Finally, the limitations of this research are the small sample of students and training institutions, as well as the mostly descriptive level of the performed analysis. In order to improve the study, it is suggested to increase the sample size of participating students, relate attitudes to other variables and competences of professional training, and generate comparative studies.

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