






# Uses of the Internet in Educative Informal Contexts. Implication for Formal Education

## Usos de Internet en contextos educativos informales: Implicaciones para la educación formal

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### ABSTRACT

Media use plays an important role in the social, emotional, and cognitive development of young individuals and accounts for a large portion of their time. For this reason it is important to understand the variables that contribute to improve the use of the Internet as a source of information and knowledge in formal and informal contexts. How is it possible to exploit the huge potential of this tool to help people learn? What are the cognitive and social characteristics that help individuals experience the Internet without being overwhelmed by its negative effects? What skills are needed to select and manage information and communication? What type of Internet use creates new relationships and ways of learning? A sample of 191 subjects was examined to determine certain characteristic differences between subjects with high and low levels of Internet use. The results show that individuals with high levels of Internet use have higher extroversion and openness scores. The research analyses the use of the Internet in informal contexts to determine the benefits that may result from Internet use in education which may include the development of the skill set necessary to evaluate information critically and analytically and build independent attitudes.

### RESUMEN

El uso de Internet ofrece un importante espacio para el desarrollo social, emocional y cognitivo de los jóvenes y ocupa gran parte de su tiempo libre. Por lo tanto, es muy importante observar algunas variables que contribuyen a mejorar su uso como fuente de información y conocimiento en contextos formales e informales. ¿Cómo, entonces, aprovechar el enorme potencial de esta herramienta para ayudar a las personas en su aprendizaje?, ¿cuáles son las características cognitivas y sociales que ayudan a utilizarla sin que les afecte negativamente?, ¿qué habilidades se necesitan para seleccionar y gestionar la información y la comunicación?, ¿qué tipos de usos de Internet suscitan aprendizaje y nuevas y diferentes relaciones? En una muestra de 191 sujetos se examinan las diferentes características entre los sujetos con alto y bajo nivel de uso. Los resultados muestran que los individuos con alto nivel de uso de Internet tienen una puntuación más alta en lo que se refiere a las características de extroversión y apertura. La investigación se basa en un marco teórico que parte del análisis del uso de Internet en un contexto informal para llegar a una reflexión sobre las posibilidades y ventajas que pueden derivarse de su uso en la educación, y del conjunto de habilidades que es necesario desarrollar para utilizar y evaluar la información de manera crítica y analítica y para construir una mente abierta y una actitud independiente.

### KEYWORDS | PALABRAS CLAVE

Learning systems, formal learning, informal learning, personal learning environment ICT, teaching, individual differences, personality. Sistemas de aprendizaje, aprendizaje formal, aprendizaje informal, auto-aprendizaje, Internet, diferencias individuales, personalidad.

## 1. Introduction

Media use plays an important role in the social, emotional, and cognitive development of young individuals and accounts for a large portion of their time (Roberts, Foehr & Rideout, 2005). For many people, the Internet has become an essential part of daily life, and they have adopted the innovative linguistic practices, cultural forms and costumes that have emerged. An example of such changes is the fact that literacies (Garton, 1997) are evolving from traditional literacy to multiliteracy practices (Cope & Kalantzis, 2000; Nuzzaci, 2012) that involve the subject viewing, creating and critiquing multi-mode texts (spoken, written, visual, aural and interactive) (New London Group, 2000). Reading and understanding the Internet (Coiro, 2003a; 2003b) represents a new way to explore reality and to build knowledge through the development of unusual relationships. Multiliteracies are therefore a container in which multiple elements converge; giving rise to educational practices that can take place in formal and informal situations. Refers to education, «formal» proposal defines a teaching/learning that takes place in the context of education in which the relationship between teacher and learner is governed on the basis of a normative institutional and ends with the release of an officially recognized certification. The expression «non-formal education» defines a proposal for a teaching/learning process in which the relationship between teacher and learner is not regulated by the legislation that concerns the institutional context of education and does not end with the issuance of a certification officially recognized.

Many people all over the world learn a series of skills through multi-level activities that are put into action when they use the Internet. The concept of multiliteracies incorporates the development of learning potential through the notion that contamination between the social cultures helps to delineate the multiple and complex contemporary languages. An American survey found that 84% of college students possessed a laptop and that 99% used the Internet (Student Monitor, 2003). Students seem to use the Internet to interact with others and find materials for assistance (Kuh & Hu, 2001; Student Monitor, 2003). The Internet is a useful tool for searching information (Kumar & Karapudi, 2012), and is becoming a key tool for news consumption by young people (Casero, 2012), but it is also a «modality/channel» that expands the notion of text to visual, multimodal and electronic hypertexts (Garton, 1997). People search for information on the Internet because they hope that more information will help them make the right purchase deci-

sion (Bei & al., 2004) and also to communicate using different modalities. For instance, Soengas (2013) believes that social networks could represent a counterbalance with respect to official censorship and government supported media, and that they helped overcome the isolation of Arab society. The Internet is a powerful device that, if used appropriately, can enhance the development of children's physical, cognitive, and social skills. Tejedor and Pulido (2012) analyzed current online risks which produce the most emotional distress for children and they focus on how to empower children in their daily Internet use highlighting the importance of the acquisition of skills related to media literacy. The research shows that the Internet is a powerful tool that is revolutionizing thinking mechanisms, learning, communication and play. Peterson and Merino (2003) agree that the Internet makes a large volume and variety of information available with relatively minimal expenditures of time, effort and money.

People can acquire information from web sites that is similar to the information available from traditional mass-media advertising but they can also acquire information directly from physical places (Peterson & Merino, 2003). The media contributes to a re-theorisation of literacy that is incorporated in ideas, practices, interventions and educational practices that teachers can implement in formal contexts (Cuzzocrea, Murdaca & Oliva, 2011). At the same time, the use and implementation of different systems of signification combined with relevant and challenging content enables the students (Gibbons, 2002) to offer sophisticated and critical interpretations and analysis of the world, their own work and the work of others. The Internet allows information to flow freely from one network to another, increasing cultural communication because information passes from one culture to another (i.e. cultural trends include Facebook, instant messaging, blogs, etc.). Cultures can directly communicate with other cultures through elements, signs, systems of signification and cultural symbolism (Nuzzaci, 2011; Nuzzaci, 2012). They use it for activities such as shopping, information and socialization, and in many other ways it is considered to be one of the key factors of innovation towards a «Smart Community» (Nuzzaci & La Vecchia, 2012).

It seems that there is no aspect of life that the Internet does not touch. It is probably the recognition of the predominance of the Internet that has recently led psychologists, pedagogists, sociologists, and semeiologists (Eco, 1975) to focus on this phenomenon (Amichai-Hamburger & Ben-Artzi, 2003). The Internet

offers an alternative for people to gratify their social and emotional needs, which might be unmet in their traditional offline networks (Leung, 2003). The increasingly multi-modal nature of our global technology is expressed at different levels and evidence shows that the majority of Internet use is for entertainment (Alvermann & Hagood, 2000; Bearne, 2003; Downes & Zammit, 2001; Sturken & Cartwright, 2001). Cyber-culture does not have a distinctly recognizable form or singular visual style yet; it does seem to mobilize different abilities and resources operating through a combination of perceptions, projections, meanings and interpretations. However, due to the easy accessibility of information, education has been able to advance in many ways. People can now learn about anything using the Internet as a source of information, but much less is known about how people use comprehension strategies during Internet use (Leu, Kinzer, Coiro & Cammack, 2004). Poor empirical evidence has been gathered to support claims that (Salomon, 1994) new types of cognitive processes and strategic knowledge are necessary to effectively locate, comprehend, and use information; the research also analyzes how this is related to the features, characteristics and traits of the individuals and highlights the importance of Internet in education (Keller & Karau, 2013).

With the exploration of context, environment and cultures, there is a decrease in cultural uniqueness because people see there are other possible ways of living life and they gain the abilities (cognitive, social etc.) that help them adapt to a complex society. In the faceless cyberspace, people can create online personas where they alter their identities and «pretend to be» someone other than themselves (Turkle, 1995: 192). They can enjoy aspects of the Internet that allow them to meet, socialize, and exchange ideas through the use of e-mail, ICQ, chat rooms and news-groups, which in turn «allow the person to fulfil unmet emotional and psychological needs that are more intimate» (Chak & Leung, 2004: 561) and less threatening than real life relationships. Amichai-Hamburger and Ben-Artzi (2000) examined personality theory in

relation to Internet use and found it to be connected to different levels of Internet use. They analysed levels of extroversion and neuroticism and found that the individuals showed different patterns in their interaction with the Internet. The main result was that extroverts and introverts use different services on the Internet. Furthermore Amichai-Hamburger and Ben-Artzi (2003) demonstrates not only that personality characteristics are related to different types of Internet use, but also that these personality characteristics are an important indicator of well-being during Internet use. Tosun and Lajunen (2010: 162) indicated that psychoticism was the only personality dimension related

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to «establishing new relationships and having «Internet only» friends; and extroversion was the only personality dimension» that is related to maintaining long-distance relationships, and supporting daily face-to-face relationships. The results of Tosun and Lajunen (2010: 162) supported the idea that for some individuals, «Internet can be used as social substitute for face-to-face social interactions while for some others» it can be used as a tool of social extension.

Correa, Hinsley, and De-Zuniga (2010: 247) «revealed that while extraversion and openness to experiences were positively related to social media use, emotional stability was a negative predictor». A description of the five personality traits is as follows: openness to experience trait refers to individuals' receptivity to learning, novelty and change. Individuals who are high in openness to experience tend to be intelligent, curious and like to try new ideas; conscien-

tiousness trait refers to individuals who are rule-following, responsible, dependable, detail-oriented, achievement-oriented, like to plan ahead, thorough and persistent; extraversion trait is related to heightened level of sociability. «Individuals who are high in extraversion are energetic, bold, warm-hearted, outgoing» and enjoy the company of others (Tan & Yang, 2012: 186); agreeableness trait is most concerned with interpersonal relationships. Individuals who are high in this trait tend to be friendly, courteous, considerate, accommodating, tend to avoid conflict, co-operative, helpful, forgiving and show propensity to trust; and neuroticism trait is often known as the anxiety factor. It deals with adjustment and emotional resilience when under stress. Individuals who are high in neuroticism are likely to have higher anxiety level, feel insecure, discontented, sensitive to ridicule, shy and easily embarrassed.

Erjavec (2013: 117) discovered that young children use Facebook for informal learning, but that they believed that there is a connection between use of Facebook and knowledge and skills that their teachers valued in school. «Young students use Facebook primarily for social support and research has shown that there» are gender differences in the expression of emotional support. These results are important because they show that personality is a highly relevant factor in determining behaviour on the Internet. For this reason it is important understand the variables that contribute to improving the Internet use as a source of information and knowledge in formal and informal contexts (Costa & al. 2013).

The Internet has a unique potential to assist people to develop the ability to build and maintain relationships and knowledge. Accessing the information easily, sharing the information and the sources of information are important factors during this process. In a learning context, the Internet can provide effective feedback to the users, enabling pair and group work, enhancing student achievement, providing access to authentic materials, facilitating greater interaction and individualising instruction (Kabilan & Rajab, 2010). In some cases, as McKenna, Green, and Gleason (2002) suggested, there may be a natural transition from an online relationship to an offline association. How is it possible to exploit the huge potential of this tool to help people learn? What are the characteristics and cognitive and social skills needed to help individuals experience the Internet without being overwhelmed by its negative effects? What skills are needed to select and manage information and communication? What uses of the Internet make relationships and

learning different? This exploratory study attempted to examine the potential influences of personality variables (emotional stability, extroversion, conscientiousness, agreeableness, openness) on Internet use. These characteristics seem to play an important role in Internet use in informal contexts (Murdaca, Cuzzocrea, Conti & Larcan, 2011).

Specifically, the purpose of this study was to examine differences in personality traits, in subjects with a high level of Internet use and subjects with a low level of Internet use after controlling for problematic use of internet. This study used the Big Five Personality Traits taxonomy (Costa & McCrae, 1992; Landers & Lounsbury, 2006). It is a popular personality classification method, and a well-established and unifying framework for measuring personality. The factor of problematic use of internet is considered and controlled because these characteristics are often the subjects of investigation and explain the negative effects that problematic use of internet can have on social and academic development of young adults (Chen & Peng, 2008). Others investigations have been made in order to determine the relation between Internet use and personality. This article brings as a novelty the distinction of personality traits between users with high and users with low levels of Internet use.

Each subject has a cultural profile with their learning outcomes and competencies. This article shall be limited to the first aspect of the problem and postpones to subsequent analysis the exploration of other questions. The significant results motivate to move forward with research. Our hypotheses were examined in a sample of Italian participants. This was deemed important because few studies have examined the role of personality in the internet use in Italy.

## 2. Material and methods

### 2.1. Sample

Participants for this study consisted of 89 females and 104 males. Participants were asked to fill a socio-demographic questionnaire asking several questions about age, gender, ethnic background, and educational level.

All the 192 participants ranged from 18 to 47 years with a mean of 31.25 (SD=8.62). All participants had the Italian nationality, were Italian-speaking and voluntarily decided to take part in the research. It was a convenience sample and they were recruited by soliciting volunteers through friends, and appeals to community groups such as churches, clubs, associations and local organizations in Messina (Italy). In terms of education level, the majority of male participants reported that

they had a high school diploma (64%), 21% had a middle school certificate, 13% had a degree, and 2% had a primary school certificate. The majority of female instead reported that they had a high school diploma (67%), 14% had a middle school certificate and 19% had a degree (fig. 1).

## 2.2. Procedure and measures

Participants signed an informed consent form. It was emphasized that participation was voluntary. They did not receive money or course credit for participation. Prior to completing the questionnaire, participants were instructed to respond to the questions as honestly as possible, and were told that there were no right or wrong answers. Participants completed the questionnaire in approximately 25 min under the supervision of a researcher.

- **Problematic Internet use:** To eliminate the potential confounding effects of problematic Internet use, in accordance with the indications of Young (1998) subjects who scored in the at-risk range on Internet addiction scale (i.e., greater than 70; Young,

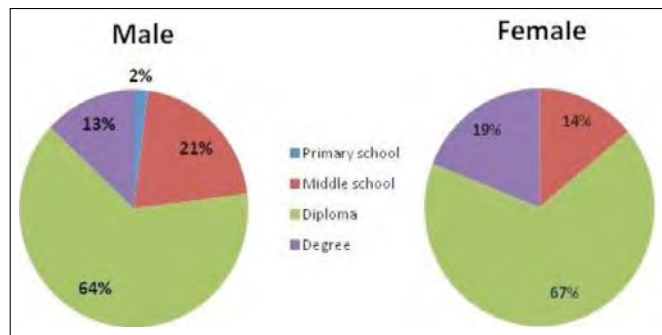


Figure 1 – Participants' education levels.

1998) were excluded from analysis. The 20-item Internet Addiction Test (IAT; Young, 1998) was used (e.g.: How often do you lose sleep due to late-night log-ins?). Respondents are asked to answer the 20 items on a 5-point Likert scale indicating the degree to which Internet use affects their daily routine, social life, productivity, sleeping pattern, and feelings. The higher the score, the greater the problems caused by Internet use. Young found a cut-off score of 70 to indicate a problematic level of Internet use. 7 subjects (3 male and 4 female) who scored in the at-risk range on problematic Internet use were excluded from analysis.

- **Internet use and online experience:** Internet use was measured by asking respondents (a) the number of days per week they used the Internet and (b) the number of hours and minutes spent on each Internet

session. After having excluded subjects at risk for problematic Internet use, subjects were categorized in two groups according to the frequency of Internet use (bottom percentile up to 49, 50 and above top percentile): low use of Internet (N=94) and high use of Internet (N=8).

- **Personality:** Personality traits were measured using the Big Five Questionnaire (BFQ; Caprara, Barbaranelli & Borgogni, 1993). The BFQ contains five domain scales: Energy/Extroversion (e.g., I talk to a lot of different people at parties), Agreeableness/ Friendliness (I am interested in people.), Conscientiousness (e.g., I pay attention to details), Emotional stability (vs. Neuroticism) (e.g.: I am relaxed most of the time), and Openness (e.g.: I am full of ideas). For each of the 132 items, respondents indicated the extent to which they assign personal relevance to it on a 5-point scale ranging from 1 (very false for me) to 5 (very true for me). Validity of the BFQ scales has been demonstrated by high correlations with analogous scales, such as the NEO-PI, on both Italian and American samples (Barbaranelli & Caprara, 2000). Alpha coefficients for the present study are presented in table 1.

## 3. Results

The Statistical Package for the Social Science (SPSS 15.1) was used. Group differences were analyzed using a multivariate of variance (MANOVA) and t-test for simple independent groups comparing and t-test for dependent groups in order to verify differences in trait's personality. All dates were transformed in  $\sin^{-1}$  (Freeman & Tukey, 1950) to normalize the distribution.

Descriptive Analyses of personality in the two groups are synthesized in table 1. Participants reported to be on line with a mean of 21.66 hours (SD=20.26) for weak: low users remain on line with a mean of 7.19 (SD=4.33), while high users of internet reported a mean of 35.21 (SD=19.99).

Differences between groups [ $F(1,190)=6.36$ ;  $p=.012$ ] were found. The tests between groups showed that subjects with higher levels of Internet use had higher Extroversion scores [ $t(190)=2.44$ ;  $p=.02$ ] and a higher score on the Openness scale [ $t(190)=3.86$ ;  $p=.001$ ] compared to subjects with lower levels of Internet use. However, the testing within the groups yielded no significant differences when comparing the five traits [ $F(4,760)=.55$ ;  $p=.696$ ]. There were differences within personality traits connected to the different levels of Internet use [ $F(4, 760) =5.30$ ;

$p=.001$ ]. In fact, a paired sample test showed that subjects that have lower levels of Internet use scored higher in emotional stability than in Openness [ $t(93)=2.74$ ;  $p=.007$ ], and subjects that have higher level of Internet use scored lower in emotional stability than in Openness [ $t(97)= 3.28$ ;  $p=.001$ ]. Subjects that have higher levels of Internet use showed higher levels of Extroversion than Emotional Stability [ $t(97)=2.78$ ;  $p=.006$ ]. Finally subject that have higher levels of Internet use showed a higher level of Openness than Agreeableness [ $t(97)=2.50$ ;  $p=.014$ ].

#### 4. Discussion and conclusion

Results have shown that subjects with high levels of Internet use have higher scores in extroversion and openness. These preliminary results of the research illustrate the potential and the advantages that could come from using the Internet for education. People with high levels of extroversion are assertive, energetic, active, upbeat, and excitable. The excitement and sensory stimulation sought by extroverts' leads them to use Internet to satisfy their emotional and social needs. Instead, openness to experience describes the originality and complexity of an individual's mental and experiential life and is characterized by activity, imagination, aesthetics, and sensitivity. Subjects that scored higher could use Internet to satisfy their need to explore and to improve their knowledge. In fact, in according with Correa & al. (2010) the positive relationship between openness to experiences and social media use found in this study was expected given the novel nature of these technologies.

Therefore, this may explain why extraverted, rather than introverted, people tend to engage in social media use. These results are consistent with other studies that explored the relationship between personality traits and Facebook and social media use (Correa & al., 2010). This result suggests that given the influence of these social media on today's social interactions—more than half of America's teens and young adults use them and more than one-third of all Web users engage in these activities—Internet designers should take into account users' characteristics and needs (Hamburger & Ben-Artzi, 2000). The same thing should happen to the school context in situations of instructional design. Social networks can become a resource for teaching and learning when they become part of a deliberate

Tab. 1 - Descriptive Analyses of personality's characteristics of low and high internet user

		Extraversion	Agreeableness	Conscientiousness	Emotional stability	Openness
Low use of Internet	M	71.51	71.53	71.63	72.56	70.88
	SD	4.66	3.79	4.93	3.77	4.54
High use of Internet	M	73.24	72.10	72.24	71.36	73.59
	SD	5.10	3.69	5.45	4.80	5.11
Total	A	.73	.75	.72	.78	.76
	M	72.40	71.82	71.94	71.95	72.27
	SD	4.95	3.74	5.20	4.36	5.01

and rational process that can be located and developed within different contexts and operational knowledge with evident implication for the opportunity to improve educational outcomes, using technologies that students are accustomed to. The results of this research indicate that the use of Internet could provide the opportunity to improve educational outcomes using technology with which the students were already familiar, especially in creating a favorable disposition to learning in the school environment using the resources available in the informal contexts (Costa & al., 2013).

In according with Correa & al. (2010) and using the notions of digital natives and digital immigrants (Prensky, 2001), this study concludes that many digital immigrants confront each change in technology as something new to be mastered. Correa & al. (2010) found that older people who are predisposed to being open to new activities are more likely to engage in social media use while for younger generations using the Internet as a social media tool has more to do with being extraverted. Younger people grew up with these digital options at their disposal to interact and communicate, making them digital natives (Prensky, 2001) and often show more skills in using digital technologies of those of teachers. If the teachers were using in the school context the same tools that the students use to communicate could identify the best solutions to help them teach better and to make their teaching more responsive to the characteristics of the students, by applying force on those variables that constitute the engine of learning (emotionality) and stimulating higher-order skills (awareness and open-mindedness), as well as meeting new forms of multi-literacy. The authors of this paper are working in this direction with a series of research initiatives that link the isolation of significant variables in the informal setting in order to verify the effects in formal context (Costa & al., 2013) and the relationship between digital competence and multiliteracies (Nuzzaci, 2011; 2012).

This research is grounded within the theoretical framework that the use of Internet goes beyond informal learning and includes the use of information in a

critical or analytic manner and building an open mind and independent attitude. Technology is an integrated part of today's schooling and everyday practice and for this reason future research should focus on assessing how students use technology as thinking tools in order to search, produce, manage, analyse, and share knowledge as well as solve complex problems individually and collaboratively (Häkkinen & Hämäläinen, 2012). Numerous researchers have been arguing that using information and computer technologies (ICTs) in traditional paper-based reading activities can maximize students' reading comprehension in a technology-supported learning setting (Chen, Kinshuk, Wei & Yang, 2008; Grasset, Dunser & Billighurst, 2008). This experience promotes critical thinking and communication, even if such impact needs to be supported by further well-documented evidence since conditional effects are relatively unknown.

Combining digital information with physical objects is the trend in education, which allows students to use technology in the classroom (Huang, Wu & Chen, 2012). Furthermore, Barron (2006) refers to the importance of self-initiated and interest-driven learning that takes place across formal and informal learning settings. For this reason, powerful computer-supported collaborative environments can be seen as essential elements in the re-structuring of social interaction and creation of knowledge (Häkkinen & Hämäläinen, 2012).

There are still some open questions and more evidence is needed for:

- Hp1 - Selective use and awareness promote the integration of all subjects and school groups.
- Hp2 - Raising performance standards in the use of Internet due to high performance standards promotes critical thinking for all subjects and school groups.
- Hp3 - Raising performance standards of Internet use due to high faculty standards promotes social awareness for all subjects and school groups.
- Hp4 - Raising performance standards in the use of Internet predicts awareness for all subjects and groups.
- Hp5 - Raising performance standards of Internet use promotes critical thinking.
- Hp6 - Raising performance standards of Internet use promotes aspirations for all subjects and groups.

The contribution suggests avenues for future research for better understanding whether the nature of the variables of use of Internet differs in certain ways, thus producing dissimilar outcomes for different groups of subjects in relation to their personal characteristics. In order to comprehensively examine the rela-

tionship between personal characteristics and uses/interaction, educational outcomes and gender race status should also be considered. In this sense, more analysis should be conducted and other instruments used to determine whether the relationships are significantly different for student subgroups. Interestingly, the types of use of Internet relate to smaller gains in cultural appreciation and social awareness. Other research shows an impact on student outcomes. The results bring to light that students, who use the Internet in a more selective and conscious way, possess higher skill levels and tend to aspire to more advanced degrees. This research contributes to clarifying the elements that act as a backdrop in the relationship between learning that takes place in informal and formal contexts, and it helps to understand how to build new forms of literacy. This relates to cultural appreciation and social awareness that represent vital factors in the improvement of the cultural profiles of the population.

## Notes

Costa S. assisted with generation of the initial draft of this manuscript and data analyses. Cuzzocrea F. assisted with study design, data analysis and interpretation and manuscript editing. Nuzzaci A. assisted with concept, manuscript preparation and editing and study supervision. All authors take responsibility for the integrity of the data and the accuracy of the data analysis. All authors contributed to and have approved the final manuscript.

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