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DOI: 10.9756/INT-JECSE/V12I1.201016

Received: 20.02.2020 Accepted: 07.05.2020

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Digital Skills and Digital Literacy: New Trends in Vocational Training

Abstract

This article focuses on the analysis of the spectrum related to the field of digital competencies in the higher education landscape, trying to focus on the most outstanding aspects of the technological landscape and its aspects. Emphasis is given to issues related to information and communication technologies and their gravitational role in educational work, taking into account the mechanisms that allow to strengthen the importance of digital literacy and inclusion. On the other hand, the panorama of artificial intelligence and its relationship in the training of professionals according to the demands of an increasingly technological environment are reviewed.

Keywords: digital literacy, digital skills, higher education, ICTs, artificial intelligence.

Introduction

The continuous advance of technology has undoubtedly generated dizzying changes and thus contributes to the development of many aspects of humanity, including education. As a result, the role of educators and other professionals has changed significantly as teaching and learning tools and educational materials have diversified and learning has taken place in this so-called global village that is increasingly interconnected.

Digital growth has increased exponentially generating a great impact and imminent changes in society in general (Zhao, Pinto and Sanchez, 2019), since in this digital era life cannot be separated from the development of information and communication technologies (ICTs) and this has had and will continue to have an impact on education, as stated by Aeni, Hanifah and Sunaengsih (2019) when they made it known that the world of education

cannot be separated from internet technology. Blagodarny, Vedyakhin, & Raygorodsky (2018), said that science and modern technologies advance so rapidly that an individual needs to develop constant learning and also acquire new skills.

The world has seen a rapid emergence of technology-compatible devices, particularly those that use wireless communication technology (Chea, Tan & Huan, 2019). In today's globalized environment, interactivity through platforms based on new technologies and their applications such as social networks is a daily occurrence, which is why their level of use has been increasing, as have the automation supports that support them (Sáez Sevillano & Vásquez, 2019). This aspect can be understood as "The universalization in terms of possession of devices that enable digital and ubiquitous content has become widespread. (Sáez et al., 2019, p. 2).

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On the other hand, Sandoval, Rodriguez and Maldonado (2017), were precise in foreseeing that the generalized opinion around the information and communication technologies (ICTs) has suffered a great change in relation to the information societies, the new platforms that are very popular to supply new modes of communication (social networks) which has been translated in an innumerable range of concepts, ideas and tendencies in relation to these aspects (Taddeo, 2019), many of which observe the problem of meeting the needs of digital literacy that brings individuals closer to the academic field to achieve a promising advantage with respect to these relevant issues "as an advantage that will lead to their natural integration into a digital society and will encourage the evolution of formal education to non-attendance modalities as an alternative to traditional education in the classroom." (Avitia and Uriarte, 2017, p.2)

In terms of Sáez et al, (2019), a crisis is brought up in relation to the classical method of teaching that is taught in the classical university (Ocaña, Valenzuela and Garro, 2019; Peters & Jandrić, 2018) and the demand for a new learning context, since the classical role of the teacher as a jealous guardian of knowledge has been left aside by the flourishing and dizzying environments offered by ICTs; therefore, there is an urgent need for new contexts to re-oxygenate learning based on the characteristics shown by the new generation (Sáez et. al, 2019). There is an intense debate on the forms, levels, quality, social implications and limits of digital participation. (Taddeo, 2019)

According to what Sevillano, Quicios and González (2016) has compiled, it has become known that some university students, within the broad spectrum that includes them, wander around the world of new technologies without being able to take advantage of the potential of ICTs as a resource for their academic training, since they catalogue them from a perspective known as web 1. 0 or static network that is characterized by a unidirectional flow of information generating a passive and neutral position in relation to interactivity in the digital world, all due to marked deficiencies within the framework of handling a digital literacy.

This is why the implementation of ICTs in the modern educational process is an indispensable requirement for training competitive professionals whose demand is increasingly in demand in the labour market (Kvon et al., 2019). This shift is considered within the spectrum of web 2.0 in which the exchange and socialization of information is the north. But even the development demanded better environments depending on the extension

of the technologies, so later were developed the web 3.0 applications that are based on the semantic web where the designs are more personalized and thus the access to information.

Technological Development and Ict Resources in Education

Innovation in the field of technology is always at the forefront and its application is by no means alien to the field of education, since according to Sattar, et al. (2019), various technologies have been introduced to improve student learning, participation and assessments, in order to aspire to enrich the quality of education. The growth of digital applications has increased exponentially, and today their changes continue to set the pattern and the technological gap (Gazca et al., 2019; Ghazanfarpour, et al, 2013).

According to this global era, learning is linked to Internet access, since students have to make use of the easy use of smart phones and similar devices to support their reinforcement in the mastery of a subject or course. This has led to a shift in orthodox teacher-centred pedagogical approaches towards learning-centred (student-centred) learning, assuming in itself that teachers are not the only source of knowledge; thus students will not be completely dependent on teachers, both in terms of learning and where to obtain lessons and materials. (Sumarsono, 2020; Ocaña, Valenzuela & Murillo, 2020)

The large-scale results obtained by Sevillano et al. (2016) indicated that the use of portable computers such as laptops and notebooks is concentrated in the academic field, where nearly 88% of these users use them to prepare work and reports in their field of study, and 55% of them use them to research on the Internet or exchange information; In addition, it was mentioned that it is the users who encourage a greater academic use of such tools and processes.

Based on the results obtained, these researchers proposed the creation of a category to identify a certain model of society or university group immersed in the use of ICTs that tend to generate employment primarily at the academic level, for which they have coined the term 'plurimodalitic' for this particular segment.

In fact, and according to references from subsequent works, this terminology has not been functionally relevant since it is only briefly seen by Mira (2017) in a work on the use of electronic portfolios in the teaching of a foreign language under the heading of teacher training

that is significantly integrated into the use of ICTs and, finally, by Sáez et al. (2019), who aimed to determine the value of use and academic benefit of ICT resources such as laptops and smartphones by analysing the informative, instructional and collaborative functions of these devices and determining the level of benefits and satisfaction achieved.

There is a direct relationship between the development of technology and humanity's dependence on it, as for example in the case of mobile devices that have already become necessary accessories in people's lives, it could even be catalogued as prostheses or optional extensions for our needs. According to Chea, Tan & Huan (2019), this has been the result of

the increase in the superior capabilities of mobile devices; furthermore, the appearance of mobile devices has had a massive impact in the field of education, especially in language learning and mobile learning. According to Chea et al. (2019), in recent years, many researchers and educators have included the use of mobile devices as an initiative to facilitate learning and ensure that students enjoy language learning, to help them maintain their motivation to learn and improve their competence. As an illustration, Figure 1 shows the design suggested by Daud et al., (2020) called KemGerly Model, which is the fusion of two previous models (Kemp and Gerlach-Ely) for the design of a mobile application to facilitate language learning.

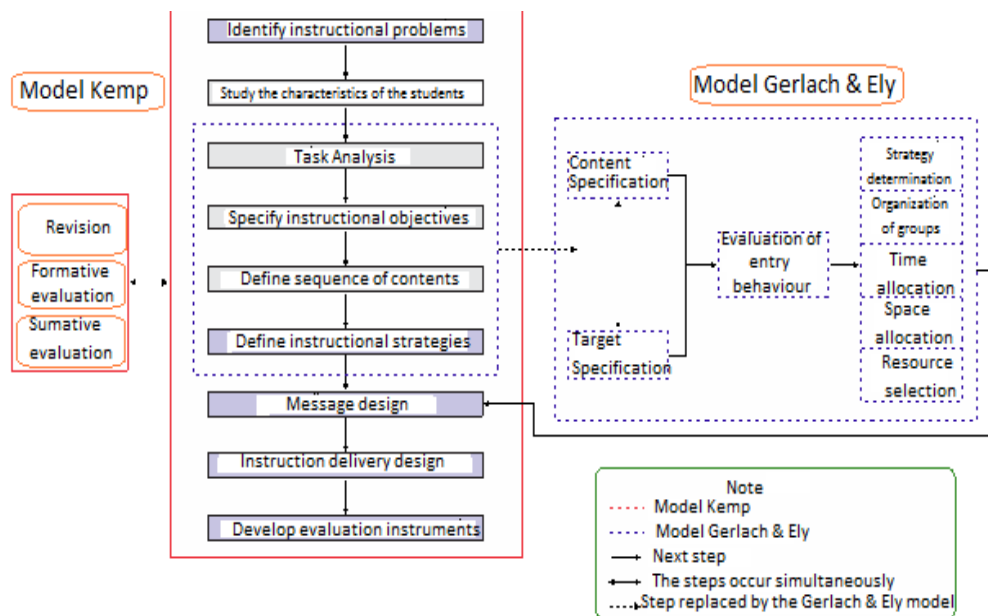


Fig. 1. Pedagogical Integration Framework (Adapted from Daud, Wong, Ghani & Saipolba, 2019, p. 37)

Another very special aspect is referred to by Lau, Bonilla, & Gárate, (2019), when they state that universities will have to train and retrain graduates to develop high cognitive skills in accordance with the new demand for work based on artificial intelligence (AI). As stated by Ocaña et al. (2019, p. 550) "there is an urgent need to develop AI technologies and systems in line with the requirements of the various needs of public or private universities.

While it is true that many of the technologies used on the web ranging from search engines such as Google, through other platforms such as Facebook or YouTube, many of them have been developed on the basis of AI, and as is well known in the field of data mining and big data, These companies collect huge amounts of data that are then converted into information from which they capitalize and there is no defense of data privacy, so this

aspect is seen by Pardo and Cobo (2020) as the universities have become data providers to these companies

Technological Literacy versus Ict-Based Pedagogical Literacy

In the face of such a changing context, the university, as an entity that generates and disseminates knowledge, is obliged to adapt to a new student profile, immersed in a new context of digital interaction, of a technological society; therefore, the study plans must be adapted to the new contexts, varying from tools and methodology to the processes of teaching and learning; because the university is on the way to becoming ineluctably linked to the new cultural model that renews the concept of literacy, that is, digital literacy. (Catellanos et al., 2017)

Gazca et al. (2019), consider that digital competencies are the main requirement to develop in today's world, but Avitia Y Uriarte (2017, p.4), give it a more pragmatic approach by conceiving that "The development of digital competencies goes beyond the ability to use technology and focuses on the use made of information and communication". Similarly, Jiménez, Martelo and Peña (2017), stated "that the transformation of the teaching-learning processes and the construction of knowledge occurs from different communicative competencies because they imply access to information that is truly universal. (p. 226).

Universities are the entities that are called to be the gravitating axis of the development of competences in the digital field (Jiménez et al., 2017) so that "digital competence has become one of the key competences that any person must have developed in order to be able to enter adult life in a satisfactory way" (Moreno, 2019, p.255).

As the expectations are encouraging in this regard, it is more regarding the generational change, Jiménez et al. (2017) perceive it as feasible since the so-called "digital natives" are more linked to the use of technologies and aimed at a greater benefit from them, towards the desired digital empowerment. In this regard, the panorama of facing true revolutions in the field of education is not very far away, if we add to it the well-known advances that are being developed within the applicability of artificial intelligence (Blagodarny et al, 2018), big data and other cutting-edge technologies, which will shape the professional profile of all university graduates, since it requires them to develop skills in modern information technologies which, in their work context, will provide them with greater qualifications and competitiveness (Khramtsova & Mayboroda, 2019; Galeoto et al., 2018;).

The work carried out by Taddeo (2019) shows the valuable importance of exercising a variety of motivations in relation to generating digital exercise among young people, since by developing an upward trend towards effective digital literacy, a better performance in the development of updated digital skills can be achieved. A similar vision is shared by Silva et al. (2016), who emphasize the need for teachers to develop relevant digital skills in relation to the use of ICTs and thus qualitatively enhance the teaching-learning processes.

According to Cabezas et al. (2017), in relation to new technologies and their adaptation to the context of higher education, it is conceived as a unifying model since "For the integration of ICT in university classrooms to contribute to the development of quality

teaching processes, it is necessary for students to have an adequate level of digital competence". (s.p.). This aspect is related to Escofet, López and Álvarez (2014) who highlighted that "young people need opportunities to develop the skills and knowledge necessary to engage with contemporary technology effectively and meaningfully. (p. 4)

As this trial is being written, humanity is suffering from the global health crisis caused by the spread of the coronavirus, which has impacted almost every aspect of life as we know it. This crucial fact has also affected the case of the action of classes at different levels in all countries, a fact that has had repercussions on the university, which has had to rethink its classic mechanisms to adapt to the current context that demands the obligatory use of new technologies and the use of the Internet and diverse applications in order to provide solutions for academic development.

This quasi-late response can be based on what Pardo and Cobo (2020, p.64) have said when they mention that "If there is something that the current pandemic has shown is that universities can be cathedrals of knowledge but at the same time they are largely ignorant of the challenges facing education in this century. On this aspect Ocaña et al. (2018) had already highlighted the urgency of changes in the university context, of an adaptation to digital contexts in order to provide attention to the various academic procedures in the field of digital skills and the adequacy of technologies according to their needs.

This aspect directly involves teachers who, in the current circumstances, are faced with dilemmas of ad force adaptation to digital environments, a situation that many of them perhaps did not foresee in the least and which has generated a violent shift to the digital field; But if the Darwinian principle is applied to the facts, not many will have survived, and of that group those who still struggle to adapt to the current environments are running out of time, since "This has forced the best prepared teachers to understand that digital environments require different certainties than analog ones, but also that the dynamics and times are not the same as those that are constructed face to face." (Pardo and Cobo, 2020, p.13)

Presentiality & Virtuality

The application of technologies in the educational field has generated new trends that are in full swing, such as flipped classrooms, which according to Castellanos et al. (2017), are taking advantage of the resources offered by ICTs in the educational field and transforming

the classic way of teaching or the classic university (Ocaña et al, 2018), where attendance allows them to interact with their students in the classroom by taking advantage of ICT resources; but the applicability of these technologies goes beyond the boundaries of the faculty, allowing them to overcome the limitations of time and space, which is where they come to carve out the virtuality reinforced by the technologies, since "the student can attend to the theoretical content at any time and from any device, while taking advantage of the classroom to learn in a collaborative manner with the resolution of doubts, research papers, case studies, debates, tutorials" (Castellanos et al, 2017, p.3)

The implementation of on-line learning makes it necessary to develop modern conceptions of pedagogical science, which implies an improved role of students in the educational process; in particular, of what they call 'Cybergogy', understood as a concept of digital learning when the source of knowledge, tutoring, educational and non-educational materials are on-line sources, which a student can access at any time. Although before there were no powerful virtual interaction platforms, within the spectrum called web 2.0, there are now better technologies that enable a wide range of applications of ICT in education. In this regard, Mira (2017, p.210) stated that "Web 3.0 is characterized by compatibility between systems and their interfaces, integrating platforms, protocols and open source software in order to create new tools.

The approach of cybergogy or cyberculture applied in teaching and learning allows to address that learning is feasible regardless of location and time, with the advantage of adapting to the needs of the student in relation to their access to the Internet through some device with which they can have access to the availability of a very complete and heterogeneous subject on the Internet (Daud, Wong, Ghani & Saipolba, 2019). Sumarsono (2020) mentions that cybergogy also facilitates learning through communities by activating participants to build debates, transmit ideas, negotiate and find solutions in a given community.

Conclusions

The academic field at university level should be considered as the guiding light in our contexts to be able to develop the deepening of the perspectives of teachers and students in the face of mobile technologies and the increasingly sophisticated form of interactivity and its relationship with artificial intelligence so that an

empowerment of these tools can be generated in favour of enriching and enhancing academic as well as research skills and thus generate increasingly effective environments that can be continuously restructured, thus being a priority axis in the development of the respective curricula and perspectives of each profession (Ocaña, et al. 2019; Sáez et al, 2019). This is why higher education is slowly but surely beginning to respond to the complex contemporary challenges of peer production, collective intelligence, the logic of openness and its broader public role (Peters, & Jandrić, 2018).

In order to achieve a process of digital literacy in accordance with the digital needs of the new generations, "they urge university professors to design conceptual and procedural activities to be mediated through these mobile devices. (Sáez et al., 2019, p.1), since "The curricula to be followed by future teachers must logically include sufficient training in digital competence" (Moreno, 2019, p.256). Moreno (2019), conceives that the ICT competence that a teacher should possess should be framed in five areas which should be articulated "to pedagogy, knowledge, ethics, technique and legal aspects related to the use of ICT in teaching" (p. 256). But the question remains: what are those aspects in which teachers should improve or come closer to achieving a symbiosis in current and required contexts? Sandoval, Rodríguez and Maldonado (2017) gave us an explanatory answer, making it clear that these teachers should have early training in relation to achieving competencies in the use of ICTs, but that they should be articulated to the curriculum and subordinated to the didactic function that is effectively exercised (Otterborn, Schönborn and Hultén, 2018; Niranjana, 2016), since "Teachers perceive that they have in their classrooms subjects influenced by digital culture, young people of the multimedia generation, digital natives, adolescents of the XXI century. " (Sáez et al., 2019, p. 2). On the other hand, one can take certain very attractive and often unnoticed junctures in the alienating process of globalization, such as the ethnographic context, from which one can take some advantage in the work that teachers may develop in trying to generate a more objective motivation toward the digital field, since these teachers must participate, in an ethnographic manner, in the digital practices of their students, in order to understand their limits, but also their potential. (Taddeo, 2019)

The world of new technologies applied to the educational field, could satisfy the particular educational needs of each student; but it should be kept in mind that the choice of learning contents is required to be adequate to the

required processes (Smolyaninova and Bezyzvestnykh, 2019). Silva et al. (2016, p.57) stressed that "Digital competence is a basic competence for any citizen of the 21st century, from which the teaching digital competence (TDC), specific to education professionals, is derived". Developing digital literacy aspects in relation to ICTs should be understood as a transforming factor at the level of education systems to respond meaningfully to society's needs. (Guillén, Ascencio and Tarango, 2016)

When higher education students develop skills in relation to the use of ICTs, based on adequate digital competencies, it is nothing more than that the student has the capacity to acquire the knowledge required to function adequately in the so-called knowledge society and at the same time is able to correctly use whatever ICT resources he or she may use in order to be able to interact in virtual information management spaces according to his or her needs and level of specialization (Cabezas et al., 2017), since "In the information and knowledge era, digital literacy is an individual's right. (Castellanos et al., 2017, p.2)

Cabezas et al. (2017), on the other hand, saw the picture by stating that:

A global society demands constant updating from teachers, they must learn to manage networked training environments, learn to interact simultaneously with a large volume of students from the virtual classroom, work in collaboration with other professionals by taking advantage of the newest tools for sharing and communicating, design interactive and collaborative content, accessible from any device, etc. (p.2)

Khramtsova & Mayboroda (2019), suggest that teaching processes in the digital age, should be supported by the field of information technology, in order to be integrated into the process of vocational training, and this is possible through the use of integrative technologies in teaching at the university level.

The review by Kvon et al. (2019) show that learning oriented technologies with modern digital communication means facilitate the development of a competitive specialist who possesses the necessary qualities to meet the requirements of the modern economy. On this aspect, Avitia and Uriarte (2017) propose that the teaching model based on the use of ICTs should be structured in a new and competitive curriculum, adequate infrastructure, efficient technological support and modern proposals for pedagogical innovation aimed at generating profiles of a professional capable of performing in the labour market (Galindo, Ruíz, & Ruíz, 2017).

This orientation should seek to ensure that the new curricula present a multidisciplinary vision in relation to learning, so that learning to think and do is adapted to the development of skills and competencies of digital environments as they are being developed and thus provide solutions to the technological challenges that the university may have during this transition. Also on this basis, the use of smartphones in the university context should not be underestimated, since it is one of the elements that is widely used by students and therefore several studies have highlighted that the mobile application increases the effectiveness of learning, transfer and exchange of knowledge, confidence and interest of students alike (Daut et al. 2020)

Regarding the panorama of AI in the field of university training, Lau et al. (2019) said that whatever the future impact of the field of AI on work, it will undoubtedly affect the new cadre of university graduates who will have to be proficient in the field of use and application of ICTs; as well as demonstrate entrepreneurship, develop social skills and manage semantic technologies to apply them to new digital learning environments and ensure lifelong learning. "During the pandemic, the need to make intensive use of digital technologies to ensure that remote learning is not disrupted has become evident. (Pardo and Cobo, 2020, p. 64). This also leads to a certain risk regarding the confidentiality of users who could have their privacy violated every time they access platforms supported by IA, which is why it is urgent to have data protection policies in order to avoid misuse of data in the future.

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