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REVIEW ARTICLE

Impact of ICT on Education: Challenges and Perspectives

Impacto de las TIC en la educación: Retos y Perspectivas

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Summary

This paper sets out the main challenges and provides an overview of the future of ICTs and their connection with education. It begins with a description of the so-called knowledge-based society and how its evolution, an offspring of technology, has encompassed different areas, paving the way for innovation in education and prompting generation of new knowledge. It also outlines the importance of each educational agent (teacher-student) and their role in transforming the teaching-learning process.

Keywords: ICT, education, challenges, perspectives.

Resumen

El presente artículo define los principales retos y muestra un panorama futuro de las TIC y su relación en el ámbito educativo. El inicio está plasmado por la definición, de lo que actualmente se llama sociedad del conocimiento y cómo su evolución, producto de la tecnología, ha abarcado distintas áreas, permitiendo innovar a la educación, estimulando la creación de nuevos conocimientos, de esta manera se describe la importancia de cada agente educativo (docente-alumno) y su rol transformador en el proceso de enseñanza-aprendizaje.

Palabras clave: TIC, educación, retos, perspectivas.

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Introduction

The Knowledge-Based Society and Technologies

Man's need to explain and understand his universe has given rise to the pursuit of knowledge in society, a necessary component to help him understand his individual and social reality. Chaparro (2001) argues that man's position in society is emerging as one where the individual will have the ability to develop and generate knowledge allowing him to adapt to a dynamic and ever-changing reality.

Nowadays "information" available can be cataloged and accessed on an unlimited and immediate basis, and transmission thereof occurs across all areas of an individual's life, including politics, economy, education, and leisure.

The vast amount of information being now generated in our society has prompted its designation as the knowledge-based society. Some scholars go further and call it the digital society or the information society in their attempt to connect it with technology; however, both concepts carry the idea of living in an age where accumulation of information provides a boost for social interactions and dynamics. (Aguilar 2012). Krüger (2006) defines the knowledge-based society as the social transformation occurring in modern society and provides a view of the future of the different sciences. Andalia (n.d., as cited in Rodriguez, n.d.) states that a difference exists between what is known as the knowledge-based society and the information society. He views the latter as a media-based digital revolution being disseminated through Information and Communication Technologies (ICT), whilst knowledge-based society bases its conception on conveying and stimulating its resources through the use of technological tools, generating faster and more effective products.

These concepts show that origins and development thereof stem from technological innovation and advances that are closely tied to ICT in the

fields of educational planning and training as well as in terms of organization (knowledge management) and work (knowledge work) (Krüger, 2006).

But how do we come to these conceptions, differences and similarities? Fernández and Panadeiro (2009) argue that convergence has occurred across the various technological areas, where computing, coupled with electronics and telecommunications, have seen their mutual relationship and support grow, with development between both being fostered.

The factors deemed inherent in this transition between knowledge and society is technology; such progress is evident in the different sciences, creating opportunities for change and adaptation, but posing challenges too. Chaparro (2001) identifies the convergence of three technological areas that have led to the transformation of contemporary societies: (1) computer science; (2) telecommunication and (3) data processing. Applications thereof in the different sciences have generated changes in contemporary society.

This relationship may be first understood a social development (Tello, 2007). In this sense, the foundation of technology and knowledge has been laid in such fashion that the connection of both play an essential role in societal development and transformation, which is due to the rapid progress and opportunities in practice, and its impact on the lives of human beings is a fact (Valderrama, 2012).

According to Rodríguez (2003), the era of progress where a society furthers its progress through capital and labor has come to an end. A competitive society has emerged that relies on the acquisition, transmission and application of knowledge. It is from these conceptions that, together with the technological edge, school educational processes emerge.

It is here that education has been influenced by technology, which has directly changed the way of interacting, communicating, studying and investigating (Pescador, 2014). Thus, technology has become an engine for opportunities, allowing the potential to innovate in education, where the

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results generated by this scientific development should seek to address such social-educational issues as are useful for development.

Integration of ICT and Education.

The impact of ICT on the knowledge-based society has brought about major changes. In terms of form and content, it has had a massive and multiplying effect, to such an extent that the purpose of knowledge has come to permeate the wider society, with education being among the broadest implications and developments brought thereby. Parra (2012) claims that school is one of the venues where technology has had the greatest impact, which in turn has had an effect on the role of the teacher and become a part of the school everyday life.

The integration of ICT into education has become a process whose implications go far beyond the technological tools nurturing the educational environment. The ideas of teaching construction and the way one can build and consolidate meaningful learning based on technology are now being discussed, or the technological use of education, in strictly pedagogical terms (Díaz-Barriga, 2013).

The transformation of ICT has allowed these to become educational tools that could further improve the educational quality of the student and revolutionize the way information is obtained, managed and interpreted (Aguilar (2012).

As part of the roles played by each educational agent, students currently use technological tools to facilitate learning. This development began early on with the emergence of calculators, TV sets, voice recorders, among other. However, such has been the progress that technological resources have become educational resources, where efforts to improve learning entail the task of involving technology with education. And it is with teaching that the teaching-learning process is being completed. According to Granados (2015), the use of ICT means breaking with traditional media, boards, pens, etc., and it has given way to a teaching role based on the need for training

in and updating one's knowledge of teaching methods based on current requirements.

Cabero (2005) states that the emerging technologies were created outside an educational context and were later integrated into it. Suárez and Custodio (2014) state that education, as a relevant aspect in human life, has combined with ICT to create a new learning environment where students take responsibility for their own learning, where time and flexibility play a major role, as education becomes increasingly digital, as digitalization has become a revolution, and as new technologies converge into emerging educational and pedagogical paradigms. (Suárez & Custodio, 2014)

Educational Challenges Facing ICT

The far-reaching changes brought to education by technology were discussed above. Hence one should bear in mind that the main challenge now is how to address this technological approach to the teaching and learning process.

Herrera (2015) states that technology and its contributions are evolving and changing the fields of knowledge very quickly. It is here that it can be appreciated that education, as a discipline, is taking on new challenges that deserve a more detailed study.

Teachers, faced with the transformative vision of a society that needs to integrate ICT into the classroom, have seen their role change into that of agents with the ability to generate the necessary skills for a society 'yearning' for technological knowledge and the frequent use thereof in various educational matters.

Successfully integrating ICT into education depends to a large extent on the teacher's ability to structure the learning environment (Unesco, 2008). There is much talk about giving the "leap" forward and "breaking up" traditional formulas with cooperation and teamwork-based learning. However, the use and involvement of ICTs in education has not yet been understood as a tool through which meaningful learning can be generated. Frequent mistakes at school minimize ICT as a tool allowing access to,

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and transmission of, information, a misconception that continues to plague traditional education. (Mestres, 2008)

Teachers must structure their role by organizing the way students acquire cognitive competences and manage to apply them in different situations (Unesco, 2008). Classroom teaching will require new spaces so as to add to current knowledge through the use of technological media by both students and teachers. The emergence of ICTs easily fits into this process.

Students participate as new educational agents, who have become a major element for communication and social interaction as a result of being born in a high-tech society (Cabero, 2010).

The diversity of scenarios, contexts and trends in education currently impose new roles on the training process, which brings challenges for future professionals and the institutions and agents responsible for their education. (Prieto, et al. 2011).

A Look at the Future of ICT in Education

The use of ICT in education has increasingly become an essential element of the educational environment. Accompanied by technological tools, use of ICT in education is to become an increasingly ever-present reality in society, hence expansion to embrace students, teachers and educational institutions will result in optimization of the teaching-learning process.

Undoubtedly, an analysis of different views in the education sector shows the importance and growing perspective of technology, which would advance social and collaborative learning, with a dimension capable of fostering the liaison between current societies and an education that is both transformative and adaptable.

Díaz-Barriga (n.d.) states that at present education may not be conceived of separately from ICT or deny the support lent by ICT to education. From this perspective it is hard to evoke any educational innovation that is not tied to technological developments.

The 2002 publication *2020 Visions, Transforming Education and Training Through Advanced Technologies* shows the different contexts in which educational institutions will forge the use of ICT in education. A collection of articles, the volume explores the feasibility of this technology, where assessment of aspects such as physical space, materials, teaching models, monitoring, evaluation and teacher training are some of the issues to be addressed by education if the latter is to adopt a more objective approach towards the importance of ICT in education.

According to Tapia y León (2013), integration of ICT in education must be accompanied by a series of guidelines defining a framework for decision-making regarding the actions to be taken during the process. It identifies three dimensions: (1) Information related to access to, shaping and transformation of new knowledge and digital environment information; (2) Communication, connected with collaboration, teamwork and technological adaptability; (3) Ethics and Social Impact, linked to the competencies needed to face the ethical challenges of globalization and the rise of ICTs.

Coll (2004) mentions that based on the different material and personal resources available to educational institutions,

> It is not in ICT, but in such activities as carried out by teachers and students thanks to the possibilities of communication and information exchange, access and processing as those offered by ICTs, that we are to find the key to understanding and valuing the scope of their impact on school education, including their potential impact on improved learning outcomes (2004 p. 5).

Conclusions

Current situation shows us that access to ICT is a major requirement for participation in a technological society (Tello, 2007). Adoption of ICTs as a means to provide access and continuity must begin by breaking up the digital divides of a society that has not internalized adaptation dynamics yet.

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There is talk of integrating ICT in education once the educational system is in a position to design meaningful learning generated through experiences and a reflective content, capable of having both students and teachers generate knowledge. The above is focused not only on the classroom (Aguilar, 2012). Every space and moment where learning occurs must conceive of the idea of becoming this signal achievement.

ICTs, as technological tools, have increased the degree of significance and educational conception, establishing new models of communication, besides generating spaces for training, information, debate, reflection, among others, as well as breaking up the barriers of traditionalism in the classroom (Ayala, n.d.).

The teaching-learning process in the classroom, using ICT, requires a set of skills to be developed by the teacher with a view to internalizing a methodology to make the most of technological tools, in which teacher training shall be deemed among the first options prior to facing new educational challenges.

In the context of ideas above, the transition from traditional education to a knowledge acquisition-based society has been no easy task. The functional role of teachers within this approach not only requires a change in their methodological practices, but a change of mind involving their beliefs in the different environments where learning can be achieved.

The contribution of ICTs to education and society as such is undoubtedly flexibility and adaptability to an increasingly changing environment. While at the outset labor was mainly affected by this process, however, the passage of time has shown that society depends on a technological approach to help it build and acquire knowledge.

ICTs, in their role as tools added to pedagogical models, can become valuable resources for learning and for equipping students with appropriate personal and professional skills for a country's development (Prieto, Quiñones, Ramírez, Fuentes, Labrada, Pérez & Montero, 2011).

References

Aguilar, M. (2012). Aprendizaje y Tecnologías de Información y Comunicación: Hacia nuevos escenarios educativos. *Revista Latinoamericana de Ciencias Sociales, Niñez y Juventud, 10* (2), 801-811

Ayala, O. (sf). Las tecnologías de información y comunicación como recursos educativos en la formación para el ejercicio ciudadano. *Integra Educativa, 5*(2), 105-118.

Cabero-Almenara, J. (2005). Las TIC y las universidades: Retos, posibilidades y preocupaciones. *Revista de la Educación Superior, 34*(135), 77-100.

Chaparro, F. (2001). Conocimiento, aprendizaje y capital social como motor de desarrollo. *Ciência da Informação, 30*(1), 19-31. doi: 10.1590/S0100-19652001000100004

Coll, C. (2004). Psicología de la Educación y prácticas educativas mediadas por las tecnologías de la información y la comunicación: Una mirada constructivista. *Revista Electrónica Sinéctica, 25*, 1-24.

Díaz- Barriga, F. (sf). La innovación en la enseñanza soportada en TIC. Una mirada al futuro desde las condiciones actuales. Recuperado de http://www.oei.es/tic/santillana/Barriga.pdf

Díaz-Barriga, F. (2013). TIC en el trabajo del aula. Impacto en la planeación didáctica. *Revista Iberoamericana de Educación Superior, 4*(10), 3-21. Doi: 10.1016/S2007-2872(13)71921-8

Krüger, K. (2006). El concepto de sociedad del conocimiento. *Revista Bibliográfica de Geografía y Ciencias Sociales, XI*(683). Recuperado de http://www.ub.edu/geocrit/b3w-683.htm

Fernández R., & Panadeiro A. (2009). Influencias de las Tecnologías de la Información y las Comunicaciones en la Universalización de la enseñanza. *RIED: Revista Iberoamericana de Educación a Distancia, 12*(1), 63-75.

Granados, A. (2015). Las TIC en la enseñanza de los métodos numéricos. *Sophia Educación, 11(*2), 143-154.

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http://dx.doi.org/10.20511/pyr2017.v5n1.149

Herrera, A. (2015). Una mirada reflexiva sobre las TIC en Educación Superior. *Revista Electrónica de Investigación Educativa. 17* (1) 1-4.

Mestres, L. (2008). La alfabetización digital de los docentes. [Educaweb.com] Recuperado de: http://www.educaweb.com/noticia/2008/12/01/alfabetizacion-digital-docentes-3349/

Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (Unesco) (2008). Estándares de Competencias en TIC para Docentes. Recuperado de: http://www. unesco.org/en/competency-standards-teachers

Parra, C. (2012). TIC, conocimiento, educación y competencias tecnológicas en la formación de maestros. *Nómadas, 36,* 145-159.

Pescador, B. (2014). ¿Hacia una sociedad del conocimiento?. *Revista Med., 22*(2), 6-7. doi: 10.18359/rmed.1194

Prieto, et al. (2011). Impacto de las tecnologías de la información y las comunicaciones en la educación y nuevos paradigmas del enfoque educativo. *Educación Médica Superior, 25*(1), 95-102.

Suárez, N. & Custodio, J. (2014). Evolución de las tecnologías de información y comunicación en el proceso de enseñanza-aprendizaje. *Revista Vínculos, 11*(1), 209-220.

Tapia, E. & Léon, J. (2013). Educación con TIC para la sociedad del conocimiento. *Revista Digital Universitaria [en línea], 14*(2). Recuperado de http://www.revista.unam.mx/vol.14/num2/art16/#up

Tello, E. (2007). Las tecnologías de la información y comunicaciones (TIC) y la brecha digital: su impacto en la sociedad de México. *RUSC. Universities and Knowledge Society Journal, 4* (2), 1-8.

Valderrama, C. (2012). Sociedad de la información: hegemonía, reduccionismo tecnológico y resistencias. *Nómadas, 36,* 13-25.

Rodríguez, P (sf). Vinculación de la Sociedad de la Información y del Conocimiento en las Universidades mexicanas. Recuperado de http://www.biblioteciencias.cu/gsdl/collect/eventos/import/Vinculacion_informacion_ universida d.pdf