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ORIGINAL

Proposal of strategies based on information and communication technologies (ICT) for the optimization of the teaching function in the field of education in the school of physiotherapy of a private university

Propuesta de estrategias basadas en las tecnologías de información y comunicación (TIC) para la optimización de la función docente en el ámbito de la educación en la escuela de fisioterapia de una universidad privada

Lucia Guada[1], Lesvia Dirinó[2], José Álvarez[2], Misael Ron[2], Estela Hernández-Runque[2]

[1]Facultad Ciencias de la Salud. Escuela de Fisioterapia. Universidad Arturo Michelena, Venezuela.
[2]Universidad de Carabobo, Venezuela.

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Corresponding Author
Lucia Guada

ABSTRACT

The proposal presented focuses its interest on promoting teaching and learning strategies supported by Information and Communication Technologies (ICT), for the optimization of the teaching function in the field of university education in the School of Physiotherapy at a public University. located in Valencia, Carabobo state - Venezuela. In this sense, in the educational process, ICT can generate a more active participation of students in the development of their training, through different educational scenarios, through the integration of interactive content, virtual reality, digital content and access to resources and materials through multiplatform software, among others. Additionally, they allow us to overcome the barriers of time and space for training, allowing it to be continuous, being increasingly used, because the rapid development of society is forcing us to reformulate the teaching and learning processes. in the classrooms.

Keywords: Virtual Strategies; Information and Communication Technologies; Teaching Tool; Teaching Function.

RESUMEN

La propuesta que se presente centra su interés en fomentar estrategias de enseñanza y aprendizaje sustentadas en las tecnologías de Información y Comunicación (TIC), para la optimización de la función docente en el ámbito de la educación universitaria en la Escuela de Fisioterapia en una Universidad pública ubicada en Valencia, estado Carabobo - Venezuela. En tal sentido, en el proceso educativo, las TIC, pueden generar una participación más activa de los estudiantes en el desarrollo de su formación, por medio de diferentes escenarios educativos, a través de la integración de contenidos interactivos, realidad virtual, contenidos digitales y el acceso a los recursos y materiales mediante software multiplataforma, entre otros. Adicionalmente, las mismas permiten sobrepasar las barreras del tiempo y el espacio para la formación, permitiendo que pueda ser de forma continua, siendo cada vez más usadas, debido a que el rápido desarrollo de la sociedad está forzando a reformular los procesos de enseñanza y aprendizaje en las aulas.

Palabras Clave: Estrategias Virtuales; Tecnologías de Información y Comunicación; Herramienta Didáctica; Función Docente.

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INTRODUCTION

We are currently living in a time of great social, economic, cultural, and technological transformation. New opportunities and challenges are arising due to the dizzying advance of information and communication technologies, which have acquired a preponderant significance, even though they provide the possibility of easy access to information.

Throughout the history of humanity, man has used different forms of communication, from sign language to remote communication, using advanced technological devices. Advances in the field of telecommunications have enabled man to perform more efficiently, and this efficiency has primarily motivated companies to set higher challenges among their workers.[1]

Considering the above, the values and attitudes of the new generations have changed due to globalization trends, creating a characteristic pattern that represents new communication styles and tools with more technology.

In this sense, we are in an era that is leading to innumerable transformations as a result of the speed with which changes occur in society. These changes are characterized by technological innovations, the service system, and socio-economic, political, environmental, and even epidemiological factors. For example, the pandemic generated by COVID-19 is leading to a reorganization of work and education with a futuristic outlook.

Similarly, technological innovation has a fundamental role, not only with the incorporation of new technologies into the teaching and learning processes but also with the work on the mass media, the expansion of the fields of training, the elaboration of new teaching materials, the professionalization of the actors in the educational process, the rethinking of the objectives and strategies of formal and non-formal education; in short, the restructuring of the higher education system as it has survived to this day.

For vocational training, educational technology must illuminate as far as possible this restructuring of education in a society powerfully transformed by technology, where assertive and effective communication plays an important role, understood as A style of communication open to the opinions of others, giving them the same importance as one's own, and likewise having to do with the ability to express oneself verbally and pre-verbally in a way that is appropriate to the culture and the situation. It is based on respect for others and oneself, accepting that other people's positions do not have to coincide with one's own, and avoiding conflicts without ceasing to express what one wants directly, openly, and honestly. Effective communication is also related to asking for advice or help in need.[2]

Interpreting the above, assertive communication aims to communicate honestly and directly with others. It also implies knowing how to ask for what you want, how to refuse, how to negotiate, and how to be flexible to get what you wish, respecting the rights of others, and expressing your feelings clearly.

In the same vein, Information and Communication Technologies are called upon to complement, develop, and transform all areas of human life, facilitating everyday tasks that should generate a better quality of life for all.

In this same scenario, we find ourselves facing a globalized society whose essential element of development and empowerment revolves around technologies; in this sense, new labor sectors are appearing. As a society with an excess of information, people must equip themselves with the ability to discern useful information from that which is not.[3]

Considering the presence of technologies in society, such as information and communication technologies (ICT), technological literacy encompasses mastering and acquiring skills in using these ICTs. This means that the individual must have a basic command of them; otherwise, not having it will represent a form of marginalization. In other words, society must be technologically literate.[3]

In the educational context, students must acquire the ability to learn, unlearn, and relearn, adapting to the demands of learning and teaching in this new society. That is why the University cannot stand on the sidelines and will have to take action to make society technologically literate.[3]

According to the different approaches, it is then necessary to situate and understand where university education is going and what it is intended to be as a society, for which the challenges that this society faces due to the presence of ICT and their accelerated development in educational settings must be addressed. It is also essential to reflect on how technologies influence the learning process and facilitation of learning and how education faces the accelerated development of technology.

In this sense, it is perceived that the accelerated development of technology and the need to use it to improve the university educational environment and, therefore, the living environment pose significant challenges to society. These challenges concern digital inequality and its consequences, or the digital divide. However, the solution to this problem depends on a complex system related to the economy and the development of countries. In this respect, it is reiterated that the University, as an institution of relevance, must commit to implementing strategies that allow access to technologies as learning tools.

In this regard, different authors, including Castells, raise some challenges that in this context have to be faced in the face of the development and evolution of technologies that the academic community should also reflect on. In other words, the University must participate and provide solutions so that these problems do not become part of the characteristics of this society.[4]

Given the above, education mediated by ICT is one of the most critical international educational policies, led by the United Nations Educational, Scientific and Cultural Organization (UNESCO), to strengthen education in countries, especially vulnerable ones. In such a way, the advancement of technologies can accelerate processes towards sustainable development, with equal opportunities for the entire population.

In this way, education can undergo significant enrichment and a vital transformation, and ICT can complement it. It is, therefore, essential to promote its use as a guarantee of access to education at all levels, offering an opportunity to support the literacy tasks of the entire population in planning education and contributing to the generation of quality education.[5]

Taking the above as a premise, the proposal presented consists of the development of a series of strategies based on ICT as a teaching tool for the optimization of the teaching function in the field of university education in the School of Physiotherapy of a private university, located in Valencia, Carabobo state. This proposal aims to highlight some strategies based on Information and

Communication Technologies (ICT) for the optimization of the teaching function in the field of university education at the School of Physiotherapy of a private Venezuelan university, as it provides a set of resources that favor the development of technological and digital competences necessary for the proper incorporation of ICT from a context of appropriation and integration.

DEVELOPMENT

Presentation of the proposal

Based on the objectives set out for this proposal, each of the strategies designed to meet the goals is described below to specify and detail their development:

Table 1. Strategy No. 1. Workshop on technological updating

Activity	Development	Resources	Time	Responsible
Technological update workshop focused on the educational use of ICT.	The workshop will be carried out by promoting the integration of theoretical knowledge with practical activities on the use of information and communication technologies focused on the educational environment at the university level.	-Humans: Guest specialists with expertise in ICT. Faculty from the School of Physiotherapy. -Materials: Computer lab. Laptops. Video beam. Internet	The course will be held over two face-to-face and two virtual days, for a total of 40 hours.	The researcher and the invited specialists.

Table 2. Strategy No. 2. Discussion groups on different interactive mechanisms and platforms

Activity	Development	Resources	Time	Responsible
Form discussion groups on the different interactive mechanisms and virtual platforms that are used.	Groups will be formed made up of teaching staff from the School of Physiotherapy to learn about and discuss the advantages and disadvantages of using different interactive mechanisms and virtual platforms.	-Human: Guest specialists with expertise in ICT. Faculty from the School of Physiotherapy. -Materials: Laptops. Video camera. Internet.	The course will be held over two face-to-face days with a total duration of 16 hours.	The researcher and the invited specialists.

Table 3. Strategy No. 3. Working groups on ICT-based teaching tools

Activity	Development	Resources	Time	Responsible
Form work groups to discuss and learn about the importance and relevance of teaching and learning tools based on information and communication technologies.	Discussion groups will be formed, made up of teaching staff and guest speakers, to learn about and discuss the importance of managing ICT-based strategies.	-Humans: Invited specialists with expertise in ICT. Teaching staff from the School of Physiotherapy. -Materials: Telephones. Internet.	Total duration 16 hours.	The researcher and the invited specialists.

Table 4. Strategy No. 4. Interactive workshop between teachers and students invited to discuss the various information and communication technologies

Activity	Development	Resources	Time	Responsible
Initiate a discussion about the different technological tools that can be used in teaching and learning processes at the School of Physiotherapy. Some representative students from the School will be invited.	A space will be opened for discussion, debate and the formulation of tools and strategies based on technologies to improve and update the teaching function in the School of Physiotherapy.	-Humans: Invited expert specialists. Invited students. Teaching staff. -Materials: Telephones. Internet.	Total duration 16 hours.	The researcher, guest students and guest specialists.

CONCLUSION

Initiating this proposal and seeking to analyze significant strategies for the implementation of ICT in the physiotherapy school of a private university is a first step towards rethinking the educational approach for the unification of technologies in higher education institutions.

It is not risky to affirm that in the use and integration of ICT in Venezuelan education, an endless number of essential and

high-impact processes come together for both teachers and students, among which we can mention the sensitization and training of teachers in the use of ICT, the adaptation of the curriculum, the project of new educational particularities, the combination of ICT in teaching, among others. However, each of these processes must be developed through objective proposals emanating from a multidisciplinary vision designed by the institution, whose banner is the integration of ICT with current education in Venezuelan universities.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

CONTRIBUTION OF AUTHORSHIP

Conceptualization: Lucia Guada, Lesvia Dirinó, José Álvarez, Misael Ron, Estela Hernández-Runque.
Data curation: Lucia Guada, Lesvia Dirinó, José Álvarez, Misael Ron, Estela Hernández-Runque.
Formal analysis: Lucia Guada, Lesvia Dirinó, José Álvarez, Misael Ron, Estela Hernández-Runque.
Research: Lucia Guada, Lesvia Dirinó, José Álvarez, Misael Ron, Estela Hernández-Runque.
Methodology: Lucia Guada, Lesvia Dirinó, José Álvarez, Misael Ron, Estela Hernández-Runque.
Project administration: Lucia Guada, Lesvia Dirinó, José Álvarez, Misael Ron, Estela Hernández-Runque.
Resources: Lucia Guada, Lesvia Dirinó, José Álvarez, Misael Ron, Estela Hernández-Runque.
Software: Lucia Guada, Lesvia Dirinó, José Álvarez, Misael Ron, Estela Hernández-Runque.
Supervision: Lucia Guada, Lesvia Dirinó, José Álvarez, Misael Ron, Estela Hernández-Runque.
Validation: Lucia Guada, Lesvia Dirinó, José Álvarez, Misael Ron, Estela Hernández-Runque.
Visualization: Lucia Guada, Lesvia Dirinó, José Álvarez, Misael Ron, Estela Hernández-Runque.
Writing – original draft: Lucia Guada, Lesvia Dirinó, José Álvarez, Misael Ron, Estela Hernández-Runque.
Writing – revision and editing: Lucia Guada, Lesvia Dirinó, José Álvarez, Misael Ron, Estela Hernández-Runque.

REFERENCES

1. Rueda, J. La tecnología en la sociedad del siglo xxi: albores de una nueva revolución industrial. 2007. The Pennsylvania State University. http://www.apostadigital.com/revistav3/hemeroteca/jjrueda.pdf

2. Mantilla, L. Habilidades para la vida: una propuesta educativa para convivir mejor. 2002. Bogotá: Fe y Alegría. http://www.documentacion.edex.es/docs/0310.

3. Cabero, J. Nuevas Tecnologías aplicadas a la educación. 2007. Universidad de Sevilla, España. Editorial Mc. Graw Hill.

4. Cebreiro, B. Las nuevas tecnologías como instrumentos didácticos. En Cabero (coordinador): Tecnología educativa. 2008. McGrawHill. Madrid.

5. Unesco. Estándares de competencia en TIC para docentes. 2008. http://eduteka.icesi.edu.co/articulos/EstandaresDocentesUnesco

6. Arza-Moncunill E, Martín-San Agustín R, Moreno-Seguro N, Escriche-Escuder A, Medina-Mirapeix F. Attributes Required by Physiotherapists to Increase Adoption and Implementation of Practice Management Software: A Qualitative Study Using Focus Groups. Applied Sciences 2024;14:1853. https://doi.org/10.3390/app14051853.

7. Ede CF, Fothergill-Misbah N, Ede SS. "Life has always been physical physical, now visual": an explorative study on the use of digital health technologies to promote physiotherapy home treatment programs among older people. Physiotherapy Theory and Practice s. f.;0:1-14. https://doi.org/10.1080/09593985.2024.2329936.

8. Odetunde MO, Okonji AM, Adeoye AP, Onigbinde AT. Acceptance and adoption of tele-rehabilitation by physiotherapists from Nigeria, a low resource setting: a mixed-method study. Bull Fac Phys Ther 2024;m29:23. https://doi.org/10.1186/s43161-024-00181-y.

9. Fernández-Lago H, Climent-Sanz C, Bravo C, Bosch-Barceló P, Masbernat-Almenara M, Sanjuan-Sánchez D, et al. Physiotherapists' experiences on assisting physiotherapy users during the COVID-19 pandemic with lockdown measures in Spain. Physiotherapy Research International 2023; 28:e2015. https://doi.org/10.1002/pri.2015.

10. Sia LL, Sharma S, Ing JBM, Kumar S, Singh DKA. Physiotherapists' perceptions, readiness, enablers, and barriers to use telerehabilitation: A scoping review. Journal of Back and Musculoskeletal Rehabilitation 2024; Preprint:1-14. https://doi.org/10.3233/BMR-240009.

11. Gonzalez-Caminal G, Kangasperko M. Co-creating in International Environments—A Clinical Reasoning Course for Physiotherapy Students. ER 2023; 7:443-8. https://doi.org/10.26855/er.2023.04.009.

12. Lange E, Danielsson L. Reaching for connection: a qualitative study of communication and interaction in video-based physiotherapy. Physiotherapy Theory and Practice s. f.;0:1-12. https://doi.org/10.1080/09593985.2023.2296574.

13. Kalra N, Singh P, Parasher RK. The validation and assessment of a curriculum based GAIT App used in teaching bachelor of physiotherapy students: a cross sectional study. Bulletin of Faculty of Physical Therapy 2024; 29:41. https://doi.org/10.1186/s43161-024-00206-6.

14. Hussain S, Siddiqui HUR, Saleem AA, Raza MA, Iturriaga JA, Velarde-Sotres Á, et al. Smart Physiotherapy: Advancing Arm-Based Exercise Classification with PoseNet and Ensemble Models. Sensors 2024; 24:6325. https://doi.org/10.3390/s24196325.

15. Aggarwal R. Domiciliary physiotherapy: A compulsion or an opportunity? Physiotherapy - The Journal of Indian Association of Physiotherapists 2024; 18:1. https://doi.org/10.4103/pjiap.pjiap_152_24.

16. Nyman A, Zingmark M, Lilja M, Guidetti S. Information and communication technology in home-based rehabilitation – a discussion of possibilities and challenges. Scandinavian Journal of Occupational Therapy 2023; 30:14-20. https://doi.org/10.1080/11038128.2022.2046152.

17. Lee C, Ahn J, Lee B-C. A Systematic Review of the Long-Term Effects of Using Smartphone- and Tablet-Based Rehabilitation Technology for Balance and Gait Training and Exercise Programs. Bioengineering 2023; 10:1142. https://doi.org/10.3390/bioengineering10101142.

18. Mikołajewski D, Masiak J, Mikołajewska E. Selected determinants of occupational stress and burnout in physiotherapists and IT professionals. Journal of Education, Health and Sport 2023; 28:62-77. https://doi.org/10.12775/JEHS.2023.28.01.004.

19. Özden F, Uysal İ, Özkeskin M. Specialized Telerehabilitation Approaches for People with Disabilities. En: Bennett G, Goodall E, editores. The Palgrave Encyclopedia of Disability, Cham: Springer Nature Switzerland; 2024, p. 1-13. https://doi.org/10.1007/978-3-031-40858-8_136-1.

20. Liljestrand C, Zingmark M. Use of information and communication technology in occupational therapy for older adults. Scandinavian Journal of Occupational Therapy 2024; 31:2271035. https://doi.org/10.1080/11038128.2023.2271035.

21. Yutong T, Yan Z, Qingyun C, Lixue M, Mengke G, Shanshan W. Information and Communication Technology Based Integrated Care for Older Adults: A Scoping Review. Int J Integr Care s. f.;23:2. https://doi.org/10.5334/ijic.6979.

22. Vagg T, Deasy KF, Plant BJ. Digital Transformations within CF Healthcare. Hodson and Geddes' Cystic Fibrosis. 5.ª ed., CRC Press; 2023.

23. Park ML, Magni N, O'Brien DW. Does physiotherapy research in South Korea match international best-practice osteoarthritis guidelines? A narrative review. New Zealand Journal of Physiotherapy 2024; 52:52-61.

24. Nizeyimana E, Joseph C, Louw QA. Organizational readiness and rehabilitation professionals' views on integrating telerehabilitation into service delivery and students' clinical training: A qualitative study. DIGITAL HEALTH 2023; 9:20552076231212314. https://doi.org/10.1177/20552076231212314.