Revista ARACÊ
ISSN: 2358-2472

DIGITAL COMMUNICATION AND INFORMATION TECHNOLOGIES: A DISCUSSION CONSIDERING THE NATIONAL CURRICULAR GUIDELINES OF THE MEDICAL COURSE

https://doi.org/10.56238/arev6n3-341

Submitted on: 27/10/2024 **Publication date:** 27/11/2024

Mayara Athanázio Diogo[1], Diego Ferreira[2], Andréia Jayme Batista[3] and Francisco Carneiro Braga[4]

ABSTRACT

This article aims to examine the role of digital communication and information technologies (TDCI) in the context of medical education, in the light of the National Curriculum Guidelines (NCD) of the medical course. The study will bring a brief historical milestone regarding the evolution of the medical education processes that culminated in the insertion of DICT in Brazil, with emphasis on medical education, in addition to carrying out a critical reflection on the positive and negative aspects regarding the insertion of DICT in the teaching-learning process and the challenges of including these technologies in the medical course. Issues related to infrastructure, teacher training and evaluation are also addressed. With the rapid advancement of technology, TDCI have become increasingly present in the educational scenario, offering unique opportunities and challenges for medical education. The article reviews NCDs, highlighting the importance of integrating DICT into the medical curriculum to promote effective and up-to-date education. In addition, the influence of DICT on the teaching-learning process is discussed, emphasizing the need for digital skills among future doctors. Finally, recommendations are offered for the effective incorporation of DICT in medical education, aiming to prepare students for the demands of a modern and technologically advanced medical practice.

Keywords: DICT. Medicine. DNC.

[1] Dr. student in Education at PPGE – UNESA
E-mail: mayaradiogoa@gmail.com
ORCID: https://orcid.org/0009-0003-9105-0627
[2] Professor at PPGE - UNESA
E-mail: diegojorge@gmail.com
ORCID: https://orcid.org/0000-0002-6158-317X
[3] Professor at the Federal University of Amapá – UFA
Dr. student in Education at PPGE – UNESA
E-mail: andreiajbatista@hotmail.com
ORCID: https://orcid.org/0000-0003-2451-755X
[4] Dr. student in Education at PPGE – UNESA
E-mail: franciscocarneirob@hotmail.com
ORCID: https://orcid.org/0000-0002-4275-8122

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ISSN: 2358-2472

INTRODUCTION

In the contemporary educational scenario, Digital Communication and Information Technologies (DICT) play an increasingly important role, transforming the way we learn, teach and practice various areas of knowledge.

Contemporary society is already born inserted in the context, where new technologies are part of various day-to-day activities, in this way we can observe an increasingly early contact with these technologies.

Harari (2015) throughout his work "Sapiens: a brief history of humanity" reveals that technology arises from the human need to dominate nature for his own benefit, in this way the human being was able to transform his habitat through methods, techniques and instruments used in the perspective of overcoming difficulties of survival and adaptation throughout history.

Nowadays it is common to see young children handling smartphones naturally, a fact that translates into the ease of generations Z[5] and Alpha[6], called digital natives[7], in handling these tools.

These behavioral changes in society attribute to technology an indispensable character for the functioning of society, whether in small actions and individual activities of daily life, or in the performance of collective activities of great impact.

In this context, Barreto, 2003, p.273 points out that "it is important to underline the opportunity to focus on "new technologies and education", a theme that is increasingly present in educational discussions". The author states that "new are the technologies that are not to be confused with the "old": blackboard, notebook, pencil, pen, textbooks, etc".

Computers, tablets and smartphones are gaining more and more space and importance in the social scenario. Santos and Ferreira (2019) state that this is the reason why the educational systems of these devices would appropriate:

> First, for its integration with the technologies in vogue and so that possible benefits could be enjoyed in the administrative sectors of school institutions; second, to be taught to students, eventually, future professional users, which, except for local actions, has not been generalized; third, as a means for teaching school content (SANTOS AND FERREIRA, 2019, p19).

[5] Generation Z: born between 1997 and 2010.
[6] Generation Alpha: born from 2010 onwards.
[7] Digital natives: generation born after 1980, whose biological and social development took place in direct contact with technology.

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ISSN: 2358-2472

The inclusion of new technologies in universities is notorious, where we will highlight medical courses in this discussion. New technologies are part of the discussions of the new curricular guidelines of the medical course, as well as gaining more and more notoriety in the teaching-learning processes. Gorgens and Andrade (2018, p.5) state that " ICTs and DICTs bring an increasing empowerment of people in health information".

In the specific context of the medical course, the effective integration of DICT into the curriculum becomes important to prepare future health professionals for the challenges of a modern and technologically advanced medical practice.

DICTs offer a variety of tools and resources that can enrich the teaching and learning process in the field of medicine. From virtual simulations of medical procedures to online learning platforms, these technologies provide interactive and immersive educational experiences. In addition, TDCIs facilitate access to a wide range of scientific information and resources, promoting the continuous updating of medical knowledge.

This article aims to examine the role of digital communication and information technologies (TDCIs) in the context of medical education, in the light of the National Curriculum Guidelines (NCD) of the medical course. The study will bring a brief historical milestone regarding the evolution of medical education processes that culminated in the insertion of Digital Information and Communication Technologies (DICT) in Brazil, with emphasis on medical education, in addition to carrying out a critical reflection on the positive and negative aspects regarding the insertion of DICT in the teaching-learning process and the challenges of including these technologies in the medical course. Issues related to infrastructure, teacher training and evaluation are also addressed.

THE INSERTION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN BRAZIL: EMPHASIS ON MEDICAL EDUCATION

Kuenzer and Machado (1982) point out that in the 1960s and 1970s, Brazil was greatly influenced by technicist pedagogy, which originated in the United States in the second half of the twentieth century.

Santos and Ferreira (2019) state that in 1990 Brazil witnessed a neoliberal wave, where several international companies conquered the Brazilian market.

The year 1995 is marked by the creation of the Secretariat of Distance Education (SEED) of the Ministry of Education, which translates the educational incorporation of ICT

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ISSN: 2358-2472

through Distance Learning (EAD), providing specific programs for this purpose, at this time there is a prioritization of distance teacher training programs.

In 1996, TV Escola went on the air.

In 1997, the National Program for Informatics in Education (PROINFO) and the Research Support Program in Distance Education (PAPED) were created, with the support of the United Nations Union for Education (UNESCO) and in partnership with the Coordination for the Improvement of Higher Education Personnel (CAPES).

It is important to understand where the expression Information and Communication Technologies (ICT) came from. Alonso (2002) reports that the expression ICT emerged from the end of the 70s, with the development of information technology and communication between computers, but from the 90s onwards they were called Digital Information and Communication Technologies (DICT).

Considering the concepts used in relation to the use of technologies in the context of education, it is important to understand the difference between the expression ICT and DICT. According to Miranda (2007), ICT refers to any technology used to support and improve student learning, such as books and movies.

Lopes (2010) mentions that the term DICT involves technologies in which the computer is the main instrument of use. At this time, the Open University Brazil of the Unified Health System (UNA-SUS) was created, with the purpose of meeting the training needs of professionals of the Unified Health System, through permanent distance education.

Ferreira, Freitas and Moreira (2018, p.26) highlight that in the first decades of the year 2000, "innovation becomes an obligation" and Santos and Ferreira (2019, p.22) highlight that it is "growing schooling that is the means to achieve it".

Considering the influence of technological changes on medical courses, it is important to understand that the first medical course in Brazil was dated in 1808, in Salvador, which aimed to train surgeons, who continued their training in Europe.

Between 1812 and 1815, the first reforms of medical schools took place, the course went from four to five years.

In 1832, the course began to last six years, following the guidelines of the Paris school. At that time, the medical course was focused on the medicalization of the disease and had a hospital-centric characteristic.

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From 2002 onwards, the Ministry of Health began to encourage medical universities to adhere to curricular change projects. These changes translate into the beginning of a rupture in the traditional teaching model, where the student becomes the center of the teaching-learning process with the adoption of active teaching-learning methodologies and the emphasis on the health needs of the population and the SUS.

These changes become part of the DNC of medical courses in Brazil. In this context, the new curricular guidelines seek the formation of individuals capable of learning continuously, highlighting the concept of "learning to learn".

At this time, it includes DICT as part of a new conception of teaching and learning, which is consolidated with the advent of the pandemic period, through an intensification of the computerized network, which is no longer a simple information tool to become a component in the teaching and learning environment.

POSITIVE ASPECTS OF THE INCLUSION OF DIGITAL INFORMATION AND COMMUNICATION TECHNOLOGIES

Considering the current society and the new student profile that has been taking shape with technological advances. Lopes (2010) states that it is becoming increasingly important for the teacher to acquire a new posture, polished by new knowledge and skills. Gorgens and Andrade (2018) state that DICT play an important role in medical education, bringing more and more didactic possibilities for the training of these professionals, especially considering the NCDs of the medical course, which requires the handling of technological resources in favor of their training.

MORAN, 2004; BACICH; MORAN, 2017 highlight that technologies can be used as a way to achieve pedagogical objectives in an innovative way, since through ICT we can carry out learning activities in different ways. However, the authors point out that the use of technological tools should not be considered essential for innovative education to be effective in practice.

DICT can be used within the proposal of "learning to learn" considering the guidelines proposed for the medical course. "Learning to learn" is a very important skill for medical students, as it is an area of constant evolution and that requires continuous learning, so it is essential that students can be able to seek this knowledge throughout their careers.

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Pereira (2016) states that DICT "favors the development of interdisciplinary and cooperative proposals and stimulates an investigative posture in relation to knowledge", a fact that provides a practice scenario compatible with the student's daily life.

CHALLENGES OF MEDICAL UNIVERSITIES REGARDING THE INCLUSION OF NEW TECHNOLOGIES

The training of health professionals has been the subject of many discussions, as the marked changes in modern society have had a strong impact on the methodologies applied to undergraduate health courses.

Considering these changes in the teaching-learning process over the years, Gorgens (2018) highlights that this does not mean that "Traditional Pedagogy" is bad.

Dias and Artur et al, 2019, p.217 state that "traditional, content-based teaching methodologies, which are still applied in disciplines in the basic area of undergraduate medical courses in some courses, favor the memorization of content". However, Stella and Puccini (2008) point out that traditional methodologies do not stimulate the development of competencies, skills and attitudes necessary for the consolidation of professional practice.

Gorgens (2018) highlights that,

> Transmitting to the student the knowledge of how to "learn to learn" is as important as the content that the student is learning autonomously. And this does not mean that the method of learning is ready. It is continuously improved in the daily life of each student (GORGENS, 2018, p.6).

However, there are many challenges that must be overcome in relation to resistance to the use of new methodologies and inclusion of DICT, when we are faced with a culturally traditional, teacher-centered course, such as the medical course.

Despite technological advances, as well as the investment of many educational institutions, it is possible to come across teachers resistant to the use of rudimentary technologies

Therefore, it is necessary to invest in the permanent training of teachers in relation to the use of new technological tools. However, it is important to highlight that the virtualization of the classroom does not configure a virtual learning environment. GORGENS 2018. P.6, states that "the simple use of information technology in school does not mean rethinking education".

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CONCLUSION

Digital Information and Communication Technologies (DICT) play a prominent role in contemporary medical education, providing significant opportunities to improve teaching, learning, and clinical practice.

When considering the National Curriculum Guidelines (NCD) for the medical course, it is evident that there is a need to effectively integrate DICT into the medical curriculum in order to prepare students for the challenges of a profession in constant evolution.

It is imperative that medical education institutions invest in adequate technological infrastructure, teacher training, and the development of teaching strategies that take advantage of the full potential of DICT.

In addition, it is critical for future doctors to acquire solid digital skills to use technological tools ethically and effectively in their professional practice.

By following these guidelines, medical education institutions can ensure that their graduates are prepared to meet the challenges and take advantage of the opportunities that digital technologies offer in the field of medicine.

In summary, DICT represent an important tool for the improvement of medical teaching and practice, as long as they are effectively and responsibly integrated into the medical curriculum, according to the National Curriculum Guidelines.

By recognizing the potential of DICT and addressing the challenges associated with its implementation, medical education institutions can prepare students for the challenges and opportunities of a constantly evolving profession, contributing to the training of trained physicians who are up-to-date and committed to excellence in health care.

Despite the evident benefits, the effective implementation of TDCIs in the medical course faces some challenges, such as the adequacy of the technological infrastructure, teacher training and the guarantee of the quality of the information available online. To overcome these obstacles, it is necessary to invest in adequate technological resources, promote continuing education programs for teachers, and develop policies for the responsible use of TDCIs. In addition, it is essential to involve students in the process of integrating TDCIs, encouraging their active and critical participation in the use of these technologies.

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ISSN: 2358-2472

REFERENCES

1. Bacich, L., & Moran, J. (2017). Metodologias ativas para uma educação inovadora. Porto Alegre: Penso.

2. Barreto, R. G. (2003). Tecnologias na formação de professores: o discurso do MEC. Educação e Pesquisa, 29, 271–286. Disponível em: https://www.scielo.br/j/ep/a/MRwwvNW96vhWWLLvKqzYjSC/ Acessado em 04/08/23.

3. Barreto, R. G., et al. (2006). As tecnologias da informação e da comunicação na formação de professores. Revista Brasileira de Educação, 11(31), 31–42. Disponível em: http://educa.fcc.org.br/pdf/rbedu/v11n31/v11n31a04.pdf Acessado em 06/08/23.

4. Barreto, R. G. (2017). Políticas de substituição tecnológica do processo de trabalho docente. In Reunião Nacional – ANPEd, 38ª (São Luís, MA).

5. Dias-Lima, A., et al. (2019). Avaliação, ensinagem e metodologias ativas: Uma experiência vivenciada no componente curricular Mecanismos de Agressão e de Defesa, no curso de Medicina da Universidade do Estado da Bahia, Brasil. Revista Brasileira de Educação Médica, 43, 216–224. Disponível em: https://www.scielo.br/j/rbem/a/sjTVkBgYZ4H3vDTHQV68SJs/ Acessado em 12/08/23.

6. Freitas, L. C. de. (2014). Os reformadores empresariais da educação e a disputa pelo controle do processo pedagógico na escola. Educação e Sociedade, 35(129), 1085–1114. Disponível em: https://www.scielo.br/j/es/a/xm7bSyCfyKm64zWGNbdy4Gx/ Acessado em 14/08/23.

7. Harari, Y. N. (2015). Sapiens: uma breve história da humanidade (J. Marcoantonio, Trad.). Porto Alegre: L&PM. ISBN 978-85-254-3218-6.

8. Gorgens, P. R. C., & Andrade, P. C. R. (2018). Educação médica e tecnologias digitais de informação e comunicação: Possibilidades e dilemas. Revista Médica de Minas Gerais, 28, 1–10. Disponível em: https://rmmg.org/exportar-pdf/2484/e2004.pdf Acessado em 01/08/23.

9. Lopes, R. P. (2010). Formação para uso das Tecnologias Digitais de Informação e Comunicação nas licenciaturas das Universidades Estaduais Paulistas (Dissertação de Mestrado, Universidade Estadual Paulista Júlio de Mesquita Filho, Presidente Prudente, SP). Disponível em: https://repositorio.unesp.br/bitstream/handle/11449/92296/lopes_rp_me_prud.pdf?sequence=1 Acessado em 28/08/23.

10. Miranda, G. L. (2007). Limites e possibilidades das TIC na educação. Sísifo/Revista de Ciências da Educação, 3, 41–50. Disponível em: http://sisifo.ie.ulisboa.pt/index.php/sisifo/article/download/60/77 Acessado em 14/08/23.

Revista ARACÊ
ISSN: 2358-2472

11. Moran, J. M. (2004). A contribuição das tecnologias para uma educação inovadora. Revista Contrapontos, 4(2), 347–356. Disponível em: https://periodicos.univali.br/index.php/rc/article/view/785/642 Acessado em 18/08/23.

12. Pereira, T. A., et al. (2016). Uso das tecnologias de informação e comunicação por professores da área da saúde da Universidade Federal de São Paulo. Revista Brasileira de Educação Médica, 40, 59–66. Disponível em: https://www.scielo.br/j/rbem/a/cdTKD88VBJddcLcfL46Kfdb/ Acessado em 19/08/23.

13. Santos, S. R. M. dos, & Ferreira, D. (2019). As tecnologias digitais de informação e comunicação e a didática multidimensional: Por uma ressignificação necessária. Revista Educação e Cultura Contemporânea, 17(47), 12–31. Disponível em: http://revistaadmmade.estacio.br/index.php/reeduc/article/viewPDFInterstitial/7286/47966541 Acessado em 26/08/23.

14. Rosa, S. R. C. de, & Puccini, R. F. (2008). A formação profissional no contexto das Diretrizes Curriculares Nacionais para o curso de medicina. In R. F. Puccini, L. O. Sampaio, & N. A. Batista (Orgs.), A formação médica na Unifesp: Excelência e compromisso social (pp. 53–69). São Paulo: Editora Unifesp. Disponível em: https://books.scielo.org/id/q8g25/pdf/puccini-9788561673666-04.pdf Acessado em 12/08/23.