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Integration of Artificial Intelligence and Info Communication Technologies in Health Educational Training: Advancing the Learning of Future Professionals through Clinical Simulation.

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Introduction

The integration of Artificial Intelligence and Information and Communication Technologies in health education has the potential to revolutionize the teaching and learning process, creating dynamic and adaptive learning environments. This paper aims to explore the benefits and challenges of integrating AI and ICT in health education, the implications for teaching strategies, and student learning outcomes.

Keywords : Artificial Intelligence (AI) in Education, Clinical Simulation, Information and Communication Technologies (ICT) in Health, Personalized and Adaptive Learning, Ethical Challenges in Health Education

Benefits of ICT Integration, A.I. and Clinical Simulation

Health education is currently facing new challenges in the teaching-learning process of its students, which has been evidenced by the artificial intelligence (AI) revolution accompanied by the great technological and communication developments that are present in our current society. Likewise, the changes that the new generations have evidenced in the way they learn and communicate have led to a need to redefine the limits and possibilities in multiple disciplines, including training in health education. Health education training has had to adapt to these changes, incorporating new technological tools and innovative methodologies to ensure effective and meaningful learning. In addition, constant interaction with artificial intelligence and communication technologies allows students to access up-to-date and specialized information quickly and accurately, contributing to improved academic performance.

In this way, AI not only improves global connectivity and access to information, but also organizes and improves teaching methods and environments, creating richer, more dynamic, and more adaptable learning spaces. This is because evolutions in knowledge, knowing how to do things, and knowing who you are, along with generational changes and technological advances, are causing changes in educational paradigms. These changes demand new ways of teaching and learning, and AI is presented as a key tool to adapt to these new challenges. In addition, AI can personalize education, allowing each student to receive an individualized approach tailored to their specific needs and abilities.

With the scientific advances that have proliferated today, there has been an exponential growth and use of information and communication technologies (ICT) in the field of education. AI, as part of these technologies, offers the possibility of improving the quality of education by providing innovative tools and resources that facilitate the teaching-learning process, allowing wider access to different information networks and communication channels, both nationally and internationally. This phenomenon is possible thanks to the internet and the use of various devices such as cell phones, tablets, computers, among others, and by the different social networks that have allowed us to be more interconnected every day.

In the field of education, particularly in health education, these changes and technological advances have led to the development and innovations in didactic strategies, which allow the teaching-learning process to be integrated into the new generations, which are increasingly closer to technological innovation, achieving that their knowledge transcends and exceeds cognitive levels until reaching the level of its applicability. metacognition and self-regulation, in a safe environment, as close to reality as possible, capable of repeating procedures, developing clinical reasoning and being

able to evaluate performance levels. All of the above underpins the importance of continuing to develop and innovate in clinical simulation, a methodological tool adapted to these new educational paradigms, while strengthening teamwork and collaborative skills.

A view from the itinerary of health education training

Didactic Strategies and Generational Changes

Didactics is the "ability to select and employ various teaching methodologies based on the proposed learning achievements" (Asún et al., 2013). According to Biggs, learning is built through the processes that students develop according to the types of activities carried out in each academic context.

With this, it is essential to recognize the paradigm shifts that have been evidenced throughout history in the teaching field, where it was possible to change the approach from a behaviorist model, where the teacher was the center of learning, where only the responsibility for effective learning converged on him or her; to a constructivist model, where the student is the main role, the creator of his own learning, the one who has autonomy in his pedagogical itinerary and with that vision that is included in this process, the evolution of generational changes in society cannot be left unnoticed with new looks, new objectives, new ways of learning, to relate among peers, to achieve competencies within a teaching-learning trajectory. This, in turn, leads to the importance of adapting to change that human beings must have, since changes that are to stay in our society are constantly being inserted, and at the same time, strategies must be generated to know how to cope with the feasible crises that can occur in different contexts such as social. economic, political and health, which can be exemplified by the way of dealing with and the modifications of these strategies in the recent context of COVID-19.

Another way to demonstrate the processes that adapt to the new needs of human beings is to observe and understand the evolution of the technologies introduced into society. Over the years, the automobile has managed to increase the maximum speed at which it can be driven and every day develop more technological models, as well as artificial intelligence has managed to work on the accuracy of data delivery, from symbolic reasoning approximately in the 50s to machine learning and natural language processing today. These technological adaptations have made it possible to improve efficiency and comfort in various aspects of daily life, such as transportation and communication. In addition, they have created new opportunities in fields such as medicine, where artificial intelligence is used to diagnose diseases and find better ways to treat them. From the 1950s to the creation of search engines (1970-2010), and now to the present day, where AI is used to create new things and interact with others through virtual assistants, take photos and videos, and so on.

At this point, it is important to highlight that artificial intelligence was created by human beings, that it has and must have limits, that it must have regulations and ethical safeguards that allow its use for the benefit of society.

With respect to the ideas that have been raised in terms of modern educational models, the teacher must use strategies so that students reach the performance levels corresponding to their curricular level according to discipline, accepting in that process the different ways of including knowledge, from physical, visual and audible strategies to virtual and/or simulated reality. It is knowing that the objective as a teacher is to guide and facilitate the cognitive process of the student, it is to recognize these changes and make them participants in them, generating new scenarios that allow the student itinerary in a more efficient and effective way.

It is the teacher who implements and designs methodologies, based on the evidence provided by the different competencies formulated and evaluated in the different health careers, in relation to the diverse potentialities of their students and the level of expertise that must be achieved in each course or training process, thus achieving the use of different methodological strategies that contribute to the achievement of learning results.

The following teaching methods focus on the development of competencies in health education: participatory-interactive theory classes; seminars/workshops; Tutorials; problem-based learning; group work and study; individual work and study; and simulations of clinical situations. The latter is very important to include in the training programs of health professionals, projecting towards the postgraduate degree and the formation of the professional profile because it allows the practice of general transferable skills that aim at continuous improvement.

In order to achieve the competencies, according to the focus of each course program, that can respond to the learning outcomes that each educational institution has committed to, the path and difficulty of the learning journey must be coordinated with its different levels of performance requirements. According to the research, this should directly reflect what the school declared and committed to in its study plan, based on the primary information collected from different actors in health services, such as from the academic perspective, based on a methodological and cognitive model, and aligned with the educational model and the perspective of the new professional who already has work experience who contributes from his experience and professional profile that is constantly development, to the construction of the different graduation profiles according to health discipline.

Challenges and Considerations

Artificial Intelligence: Its Role in Educational Models and Clinical Simulation

The incorporation of Artificial Intelligence (AI) together with Information and Communication Technologies (ICT) are progressively transforming the educational paradigm, especially in the field of health. It is crucial to understand the confluence of these emerging technologies and how educational and didactic strategies are shaped to adapt to an ever-evolving society. As reported by Cabero (2006), Pedagogical Bases of e-learning (Revista de Universidad y Sociedad del

Conocimiento (RUSC), 3(1)), ICTs are not only important in computing, microelectronics, and telecommunications, but also in interconnection and interactivity, as they allow the creation of new communicative realities.

Communication that is synchronous and asynchronous, facilitated by the combination of AI and ICT, has changed the way health education is conducted, by allowing people to gain information and learn from a variety of methodologies, including face-to-face, virtual, and remote settings.

As a method, clinical simulation is a leader in the development, disruption, and advancement of AI, and is expected to become even more so in the future. It allows students in the health area to learn and develop the skills and competencies they need in a safe and controlled environment.

This methodological adaptation responds not only to technological transformations, but also to demographic changes, the empowerment of patients, and within a context of their rights and duties and legal mechanism, which has been modifying the way health education is taught. These also include the difficulty in having sufficient quotas for internships in clinical fields and the needs of students, along with the responsibilities of educational institutions in complying with the specific requirements of each health career. This makes the use of AI-assisted simulations for the development of clinical skills and competencies a relevant factor every day.

An example of the integration of AI and ICT in health education is the use of virtual simulations in clinical training. Virtual simulations allow students to practice clinical procedures in a safe and controlled environment, improving their skills and confidence. For example, medical students can use virtual reality simulators to perform surgeries and practice decision-making in high-stress situations, just as obstetrics students attend their births in a simulated way in a highly technological phantom that allows, together with well-planned and implemented scripts, to develop clinical simulation scenarios of high fidelity. . These simulations provide valuable hands-on experience that is difficult to replicate in traditional classroom settings.

As a result, academic teams have had to quickly initiate a process of deeper understanding, management and application of technologies. This is due to the new way people learn and the lack of opportunities to do things in a real-life setting, which can be caused by things like population changes, health and social crises, and modifications in health care related to patients' rights based on ethical principles.

The application of AI in clinical simulation also highlights the importance of infocommunication in health education, as it needs to handle various devices, recordings, and data effectively and accurately. Simulation, for example, develops and promotes the student's ability to perform procedures on real patients, improving learning (Brigden, 2008). Under this approach, simulation has multiple advantages, as it fosters learning based on one's own experience, including immediate feedback and allowing for errors in a simulated scenario. In this way, the safety of the patient and the student himself is safeguarded by having greater possibilities of training in procedural, attitudinal skills and collaborative teamwork.

This breakthrough focuses not only on the management and storage of information, but also on how it is evaluated, processed, and used to improve educational effectiveness. Teachers, therefore, must constantly improve their use of these emerging technologies to act as effective guides in the teaching-learning process.

The need for innovative educational responses in health is based on advances in health education, globalized access to information, and competency-based learning. Health professionals, therefore, must build their learning at different levels, focusing on self-motivation to solve problems and self-learning through their previous experiences and new knowledge acquired.

This translates into the importance of inclusion and curricular adjustments in the different health-oriented educational plans that manage to account for the new ways of monitoring learning through current innovations in AI, ICT and clinical simulation using robotics in different disciplinary fields of health education. in the possibilities of specialized training under these didactic strategies as part of the transformation of practice and teaching in this field.

It is important to note that being able to use and recognize the effectiveness of learning together with different information and communication technologies, artificial intelligence and clinical simulation tools in healthcare, makes it possible to make the most of the time allotted to complete a task as part of the learning outcomes to be achieved in a health professional training program. while still leaving time for real socializing. In this way, we can encourage the sharing of knowledge, the development of effective communication skills, empathy and collaborative work, thinking in depth about what we want to achieve as a society.

Finally, this well-rounded teaching and learning process is important to prepare students for professional practice in a safe environment where they can try new things, make mistakes, and learn from their mistakes. They can do this in an environment that allows for clinical practice and through an enriching space for individual and group feedback, as they gain skills in a variety of areas. Conscious adaptation to this new technological and educational reality is not only a necessity, but also a responsibility to promote the development of competent and conscious health professionals in an interconnected and technologically advanced world.

AI and Mental Health

When we examine the systematic review of the planning of the different health-related courses, we can see what has already begun to be planned using AI and what it could mean for each student's academic schedule, as well as from the teacher's point of view.

As a teacher, when deciding how to use artificial intelligence in their lesson plans, based on an educational model and the new reality of technology that interrupts learning, the teacher must be able to find out and recognize what educational content, performance levels and curricula are appropriate to use this tool, as part of the skills that students need to learn. It can be very useful in the use of collaborative work, such as, for example, problem-based learning and self-learning that has the ability to give immediate feedback, being clear that it is a collaborative tool in the learning process, not learning itself.

Along with this, it is important to recognize that AI manages to optimize the time spent studying and, in this way, make meaningful student learning more efficient. This is projected as a strategy that allows them to distribute their time in recreational processes in participation in social and family activities that can contribute to their mental health. Therefore, educational institutions have to safeguard the reduction of connectivity gaps as part of the principle of equity.

In addition to the above, a teacher can generate many different ideas and projects related to the use of AI. For example, they could use it to improve training, education and health care, as well as to engage in research processes and social activities with the community, involving students as well. They could connect with the community through a tool that helps them improve the speed and efficiency of their work on different tasks. With this, AI is positioned as a protective factor for mental health by optimising their workload, responding to their teaching commitments, and optimising time to be able to share with their family and affective bond.

The Integration of Artificial Intelligence and the Implication of Ethical Aspects

The integration of new technologies should be a gradual process, depending on the analysis of the performance achieved by the students, the feasibility of standardizing procedures and the continuous training that the teachers must have. It is very important for educational institutions to understand that the evaluation process must guarantee the quality of the health education offered and that it is an ongoing process that involves all the people and resources involved in the educational process and includes feedback loops with the aim of continuous improvement. The assessment should also take into account the needs and expectations of the students, as well as the demands of the labour market in the field of health. In addition, it is essential that clear and objective indicators are established to measure student performance and the effectiveness of educational programs. These indicators should be reviewed regularly and adjusted as necessary to ensure that quality standards in education are met.

It must be socialized with the different actors involved in this educational process, recognize their challenges, their advantages and disadvantages and identify the moment according to curricular level and degree of performance, which will be evaluated by the student and that can be a strategy that facilitates their process of cognitive development and the gearing of their own and new knowledge, highlighting that each new scenario experienced by students and teachers make it essential to adapt to their own needs. changes to the efficiency of the methodologies to be used, safeguarding the good use of these technologies, taking care and emphasizing that ethics must be made visible and considered, as an essential approach for the balance of knowledge and the structure for its achievement, from the cognitive focused on its own reality through lived experiences and the search for knowledge; From know-how, as the achievement of the integration of knowledge and the interlocking of the concepts of effective learning and knowing how to be, which achieves the capacity for autonomy of knowledge, of making relevant, coherent and timely decisions in a specific situation, within a context in health care. The balance of knowledge and structure is essential for effective health care. This involves not only having strong cognitive knowledge and lived experiences, but also the ability to apply that knowledge in concrete situations and make relevant and coherent decisions. The autonomy of knowledge and the ability to make timely decisions are key aspects of knowledge in the field of health care. All this hand in hand and balanced with the ethical principles that allow us to recognize the possible biases of artificial intelligence, taking care of the focus on gender, inclusion and non-discrimination and respect for privacy by complying with regulations, for example, in the use of a database of patients who must have been previously informed through an effective process, which entails steps to follow, among these: information to the patient, implications of their participation through personal information, from the approach of risks and benefits attributable to the use of data in an informed manner and in a responsible and safe context.

AI is crucial for clinical diagnosis, clinical decision support, and the use of electronic health records, serving as a tool to identify diseases and predict clinical outcomes. We see the role of AI as an aid that can create and be part of a technological, communication, academic, research, and marketing impact. We also think about the future advances that could be made in the field of health, respecting ethical norms and taking into account the fact that this tool could be inaccurate and the indisputable role of the human being as a thinker, being evolved and evolving with discernment and morals.

It is important for teachers to move forward with these new technologies because they are impacting the situations we live in every day, including generational differences and attitudinal shifts, as well as different social and cultural realities. In this way, they can act as guides and facilitators in the teaching and learning process, understanding that today's students use them easily and as a way to communicate.

The adaptability that teachers must have is essential to respond to generational changes and their way of learning, and educational institutions must respond to innovation requirements so that this process is integrated as part of quality assurance.

Conclusion

In conclusion, the integration of information and communication technologies (ICT) and simulation in health represent driving didactic tools, fundamental for the evolution of education in the area of health. These technologies, together with artificial intelligence, are reformulating the educational paradigm, focusing it on the needs and autonomy of the student, allowing the development of competencies, skills and critical knowledge in a more efficient and contextualized way.

Advances in synchronous and asynchronous communication facilitate real-time and deferred interactions, removing the barriers of time and space and enabling more flexible learning tailored to students' individual circumstances. In turn, clinical simulation allows for practical and experiential learning, where students can internalize and apply their knowledge in controlled and safe scenarios, encouraging feedback and continuous learning.

The integration of artificial intelligence with ICT enhances the personalization and adaptability of learning, allowing the creation of richer and more diversified educational experiences. AI can analyze and adapt to students' individual needs, preferences, and progress, offering more fine-tuned and effective learning opportunities. In addition, these technologies enable the storage, processing, and exchange of information in a more agile and robust way, essential for training and practice in the health area.

However, in order to take full advantage of the potential of these technologies, it is crucial for educators to constantly improve the use and application of ICTs, health simulations and artificial intelligence, to act as facilitators and guides in this new educational landscape. In addition, it is imperative to consider and address the ethical, technical, and pedagogical challenges that emerge with the adoption of these innovations. From this perspective, teachers have a fundamental role in being a guide and facilitator of the teaching-learning process in these new times, guiding and deciding which are the competencies to be developed that can be more oriented to the use of A.I., Clinical Simulation and ICT within a training plan for health professionals. safeguarding the correct use and principles of the educational model of each educational institution.

Every day, our society faces new challenges that demonstrate the importance of people being able to adapt, of using new tools and strategies in education, of people working collaboratively in health education, of ethical issues always being taken into consideration in our actions, and of strengthening connections. These are some of the most important things that different university health training schools should think about when they are making their lesson plans, since everything points to being able to train professionals who lead humanized, respectful and comprehensive patient-centered health care, which allows for quality and safe responses to the health needs of the population. In summary, ICT, clinical simulation and artificial intelligence represent fundamental and transformative tools for health education, focusing on empowering students to develop their competencies and adapt to a health environment in constant evolution and complexity, with the teacher having a fundamental role in guiding and safeguarding these educational processes. Continuous reflection and adaptation are essential to navigate and co-create the future of health education in an ethical, inclusive, and effective way.

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