

ARTIFICIAL INTELLIGENCE AND EDUCATION Challenges and disadvantages for the teacher¹

Hernando Barrios Tao²
Vianney Rocío Díaz³
Yolanda M Guerra⁴

Summary

This article is derived from the research on artificial intelligence and bioethics, humanist challenges and judiciary implications of robotics (2015-2019) with the New Granada Military University, for the Faculty of Education and Humanities, Leadership research group. The objective of the research has been to identify teachers' perception of the application of robotics and artificial intelligence in education through the methodological elements of analytical empirical research. As for the findings, extensive fieldwork was done with more than 140 teachers from various programs, mainly with a master's degree in education in the city of Bogotá in Colombia. This paper gives an account of the challenges and disadvantages that teachers encountered regarding the possible use and generalization of robot practices and in general the usage of artificial intelligence in education.

Keywords

Artificial intelligence, education, challenges and disadvantages.

Research Question:

What is the teachers' perception about the application of artificial intelligence and robotics in the teaching-learning processes?
Other research questions? What are the challenges of the application of robotics and artificial intelligence in education?

¹ Research Project. Inteligencia artificial y bioética. Desafíos humanistas e implicaciones biojurídicas de la robótica (2015-2019) Identificado como Proyecto RAD-INV-HUM-03: Yolanda M Guerra - Hernando Barrios Tao - Vianney Rocío Díaz Pérez - Juan Carlos Ávila Morales.

² Hernando Barrios Tao, professor of Education and Humanities Faculty Universidad Militar Nueva Granada

³ Vianney Rocío Díaz Pérez, Professor of Education and Humanities Faculty Universidad Militar Nueva Granada

⁴ Yolanda M Guerra. Professor of Education and Humanities Faculty Universidad Militar Nueva Granada. Bogotá Colombia.

What are the disadvantages of the application of robotics and artificial intelligence in education?

Objective

Determine the teachers' perception of the application of artificial intelligence and robotics in the teaching-learning processes.

Methodology

The research has two parts, the first part is theoretical where texts that define artificial intelligence, robotics and the convenience of its application in education were read. The second part is a field work where the survey and direct participant observation are used. This was done with 140 teachers of master's in education and PhD programs in Bogotá Colombia. The questions were of a closed nature. The results were tabulated and presented.

Introduction

Artificial intelligence in all areas of human life has had an important boom in the last ten years. However, for a long time, those who study the dangers of robots and artificial intelligence, especially in education and in everyday life. Isaac Asimov (1983) already prevented us from the possible dangers of using artificial intelligence in daily life. With regard to education there are challenges and challenges that must be considered. Starting from the premise that nothing can replace a teacher, the use of robots and other artificial intelligence instruments in the classroom or instead of the classroom, does not cease to have dangers that must be considered in depth ((Díaz , V. Guerra Y. 2019)2019).

The application of artificial intelligence in general and specifically in the field of education contains very deep dangers that must be studied in depth. The new generations are already focused on addictive monsters that are all contained in a small hand-sized element: the cell phone; which in turn connected to the Internet makes social networks twitter, instagram, Facebook, snap chat and others available to the individual who no longer has time to apply the maximum of Socrates: Know yourself. Current generations seem increasingly connected to their networks and technological instruments, but increasingly disconnected from their neighbors, their families and even themselves. Imaginary or virtual friends occupy a relevant place in people's lives, who spend hours updating their profiles and videos, photos and stories for others to review. It seems that we are facing the advent of a culture that worships the ego and has little to do with the truly important (Díaz, V. Guerra Y. 2019).

If we add to this empty classrooms, absence of human teachers, contact with robots and other artificial intelligence instruments, what kind of individual are we forming for the support of the planet and future generations?

Brief historical panning

The dream of the human being has always been to build machines or to be able to enjoy what others have done, that enjoy high intelligence, but without the defects and limits that human beings have susceptible to suffer wounds, get sick or die (Guerra Y. et all 2018).

This dream began long before the Greeks and in Indian literature, with the coming of Brahma, Vishnu and Shiva and the appearance of Shri Hanumana who could become any animal, be as large as the planet or as small as the smallest flea. In Greek literature there is also the myth of Pygmalion, which says that the King of Cyprus was looking for a woman to marry the only condition of being a perfect woman, not finding her decided to make sculptures closest to his concept of beauty to such a point that he fell in love with one of them until he came to dream that this sculpture came to life, Aphrodite, seeing so much desire, decided to give life to the sculpture and entrust the king to love and care for it.

The myth of Talos is another of the stories with which man has sought to personify non-living figures. The myth tells that the giant Talos was a giant bronze statue in charge of taking care of Crete. It is also interesting to know the Jewish history of the Golem, that clay giant charged with defending settlements from anti-Semitic attacks. It is also noteworthy the mathematical games of the Towers of Hanoi invented by the French mathematician Édouard Lucas and that he himself goes back to 3,000 BC. It is said that in a temple in India three columns were found with 64 golden discs, the priests of Brahma should move the disks at the rate of one by movement in order to organize them in the same way in the last column, and when the last movement It has been realized, the world is also over.

In more recent times the mathematician George Boole (1847) proposes the logic of zero order, and what he intends is to establish propositions that through operations form other more complex propositions. In 1879 Gottlob Frege takes a little further than Boole and proposes the logic of the first order, currently in force.

Now, when it comes to "artificial intelligence", one usually cites who is considered his father Alan Turing. It is he who first proposes in an article for a scientific journal in the 50's the ability of machines to make reasonable

decisions. He makes the philosophical questioning of whether it is possible for a machine to be intelligent or not. That question tries to solve it by means of a test called Turing test. This test is based on asking a person if he is able to distinguish between two decision-making processes of which he does not know who made it (if an individual or a machine), if the "judge" is not able to distinguish between making decision of a computer and a human being, means that the computer made a close decision - if not identical - to human reasoning ((Díaz , V. Guerra Y. 2019)2019)..

Because of that enthusiasm to imitate human reasoning, Turing was part of the developers of the first software programmed to play chess against a human being

In 1956, the term was first coined at Dartmouth College within a conference entitled "summer research projects in artificial intelligence" sponsored, among others, by Harvard University and IBM. The objective of the conference was to discuss a hypothesis: the learning of a human being could be described step by step to such an extent that those steps could be taught to a computer in order to simulate a human being.

This conference generated such enthusiasm that attendees made projections that at ten years artificial intelligence would be a palpable reality, and after that time and not having met the expected goals, the research field lost momentum to the point that it stopped Investigate in it for almost 15 years.

After the investigation in artificial intelligence was disappeared for a long period, in 1987 researchers Martin Fischles and Oscar Firschein set themselves the task of defining the characteristics that an "intelligent agent" should have in order to have clear parameters of what That was being talked about. In this descriptive work, the researchers managed to identify 12 attributes that every intelligent agent must have (Díaz, V. Guerra Y. 2019), namely:

1. Has mental attitudes such as beliefs and intentions.
2. Has the ability to gain knowledge, that is, learn?
3. It can solve problems, even partitioning complex problems into simpler ones.
4. Able to perform more complex operations.
5. Understand. It has the ability to make sense, if possible, of ambiguous or contradictory ideas.
6. Plan, predict consequences, evaluate alternatives (as in chess games)
7. Know the limits of your own skills and knowledge.
8. Can distinguish despite the similarities of situations.

9. It can be original, creating even new concepts or ideas, and even using analogies.
10. You can generalize.
11. Can perceive and model the outside world.
12. Can understand and use language and its symbols

With the characterization of the attributes of the artificial agent, the object of study was diversified around the subject of artificial intelligence, it became dependent on the ultimate goal that was sought with the research based on the characteristic that is considered most convenient.

In the 1990s, IBM focused on developing a supercomputer capable of beating the world champion in chess - considered by many to be the most complex game in terms of strategy - to show that artificial intelligence was a reality. In the year of 1997, Deep Blue meets the goal set by IBM, manages to beat the world chess champion Gari Kasparov after failing the previous year.

The 21st century arrives with enthusiasm for artificial intelligence developers. After IBM's success with Deep Blue, the other competing players began to make more and more significant advances in this field. Bots begin to develop - programs for computers capable of performing repetitive tasks with the aim of replacing human work that would otherwise be tedious and repetitive to perform - especially the chats in order to start conversations with the user on the other side of the screen and always giving the feeling of being two people who interact.

These programs begin to arouse great interest among the academic community - and non-academic -, so much so that they begin to reward the best software annually based on what was proposed by the Turing Test, which in general terms is that a judge asks questions to two hidden competitors - a human being and a computer - and after reading the answers you must say which is the human being and which is not. The less success the judge has, the more effective the software is (Díaz, V. Guerra Y. 2019).

Artificial intelligence has had so much impact on society in general - both positive and negative - that the permanent comparison with human beings has become obsessed. In 2011 another challenge was carried out that involved artificial intelligence vs. human intelligence. It was held within the framework of one of the most famous quiz shows in the United States, there the IBM supercomputer beat the two contestants who had historically had the best performance in reality.

Then, in 2014, a computer successfully passed the Turing Test, at the University of Reading (England), posing as a 13-year-old boy and doubting the jurors of the true identity of the participant. This event is considered a historical hit in the development of Artificial Intelligence.

Recently several mega companies dedicated to software development have been given the task of thoroughly exploring the limits of artificial intelligence, so much so that giants such as Google, Tesla, SpaceX, among others, have developed their new programs based on artificial intelligence, from applications we use daily on the mobile device, which tells us where we are, who we are with; to satellites capable of taking off and bringing the starting point back to the impeller capsule without any damage.

Ethical dilemmas of robotics and artificial intelligence applied to education

An ethical dilemma is a situation to which the human being is confronted when he opposes, on the one hand, morality or conscience and on the other, life, from the point of view of the daily life. This definition shows that these dilemmas only correspond to the jurisdiction of the human being and cannot be extrapolated to any other being - alive or not - on earth.

In that order of ideas, human beings face ethical dilemmas daily and if that is added to the increasing technological progress, which has forced decisions that involve choosing between human beings or machines, several ethical dilemmas arise that They have been generated by the development of supercomputers and more specifically by the development of artificial intelligence.

One of the ethical dilemmas that can be identified is the problem of unemployment. The development of machines, increasingly specialized, has generated that from the industrial revolution to the present more and more work places are being suppressed. Starting with the less qualified, repetitive jobs and in which little reasoning is needed for its execution, even more complex jobs that need surgical precision for its performance, they have been replaced by machines that are "more efficient" -in economic terms-, and they have made man reinvent himself and learn other more specific trades so that he can sell his workforce and thus be able to survive in a world that demands money to preserve a comfortable lifestyle.

That raises the dilemma of what will happen when the machines come to replace all the human labor that the industry needs to function? One of the most

immediate answers is that the human being will enjoy a better quality of life since his time will return to belong to him to devote himself to what he really loves, but in turn opens the possibility to another ethical dilemma Will states be able to generate a welfare state for their entire population when said population does not generate income in the classical way?

Another ethical dilemma faced by today's society is the "humanism" of the human being. Currently, society is dependent on technological advances in all aspects, from a cell phone to machines to maintain an acceptable quality of life. This has posed that humanity wonders if freedom has been lost to technology or if it is really technology that serves the human being only when he demands it.

There are more and more cases in which young people, born in the midst of scientific advances, take refuge in technological devices and isolate themselves from social interactions. In Japan, a movement called "Hikikomori" groups young people who have decided not to leave their homes again and only "interact" through video games, computers or cell phones. Are these signs of humanity's loss of the human condition?

Now, with the euphoria in which the civilized world of developing programs for a number of tasks is found, security has become paramount in the improvement of these software. Today, face identifiers connected to databases of suspects of committing acts against security - national, public, human - are found in all western airports.

Do not forget that these programs are developed by human beings, and by that condition are subjective beings. Google has already developed programs that just take a picture identify: place, time, context, and people. If we take that on a larger scale, we will face extreme surveillance 24 hours a day, 7 days a week by cameras everywhere. That makes humanity face another ethical dilemma: What prevents those programs - developed by human beings - do not use a bias, call: racist, sexist, ideological, religious; to identify a person as "suspect" over another?

In this scenario, artificial intelligence becomes a "big brother" who is responsible for the regulation of human beings in their day to day. The human being will become a being capable of being watched and in the care of someone else. This variable opens another ethical dilemma that would materialize at the moment when the human being relies on artificial intelligence to eradicate what he considers contrary to good living.

That category would completely end the individuality of the human being, and if only medical causes are referred to, in order to end the diseases, artificial intelligence could, likewise, end the human species since it is the one that carries the diseases undesirable

If it is accepted that the human being be cared for by an entity, created by himself, superior in capacity for analysis, it would be pertinent to ask whether that entity should enjoy legal status and be considered a subject of rights. That would end up equipping artificial intelligence with the human being and in fact putting it a step up on the evolutionary scale since it would be a kind of tutor of the people.

The ethical dilemma of recognizing rights to artificial intelligence would require a reconfiguration of the legal, political and social structures that make the social structure unfeasible as it is known today. It raises questions of such magnitude as they could occupy political positions?

The problems raised in relation to advances in art intelligence have gained much relevance today, not only because of the extension of the implementations of new systems in human sensitive fields, but also because of the discussions that have taken place around the hypothesis of the proposed technological singularity. Initially by Kurzweil (2005). This hypothesis seeks to anticipate and predict the developments of artificial intelligence, to the critical point of its singularization, that is, the moment in which artificial intelligence can match or exceed human. According to Kurzweil the singularity is close and will produce an unprecedented revolution.

Some background on Artificial Intelligence and education

Based on the interaction of computers with human beings and the possibility of affecting moral rights and obligations, Carsten (2004) raises the question about whether computers can act as autonomous moral agents. Based on the information defined as meaningful data, elements are developed to resolve the issue. The research development presents results, through the use of the Moral Turing Test, on the impossibility of computers to capture the meaning of information and reflect morality.

León and Viña (2017) present a study on the opportunities and threats of artificial intelligence in the field of higher education: teaching-learning, spaces, objects, methodologies, evaluation, are some of the transformed aspects. The need to accompany, care for and enhance the opportunity of AI in education is indicated.

Guerra and García-Mayor (2018) indicate two fundamental challenges posed by the use of artificial intelligence in two processes in the world of health, diagnosis and clinical treatment. On the one hand, the possible misdiagnoses made by AI due to incorrect or incomplete data introduced in the systems and the subtle differences between sexes, races and people. On the other hand, the possible injury in the doctor-patient relationship based on the trust and confidentiality of these two actors.

Ocaña-Fernandez, Valenzuela-Fernandez and Garro-Aburto (2019) develop in their work some challenges of the university before the promises of the new formats based on artificial intelligence for the qualitative improvement of education. Aspects such as the personalization of learning, the integration of various forms of human interaction with ICTs, indicate the need to plan, design, develop and implement digital skills oriented to the training of professionals capable of understanding and developing the technological environment according to their needs

The empirical review of "humanist thinking" (social-personal) in relation to information and communication technologies (Velarde Hermida and Casas-Mas, 2019) was carried out with two objectives. The first "identify the implications of ICT in the dynamics that affect the humanization and dehumanization of our societies in scientific publications"; the second "verify whether such representations provide continuity to the humanist thinking existing in the historical periods prior to the emergence of ICTs." The results grouped the dynamics of humanization / social dehumanization into six categories: a more just and solidary society versus a more unfair and less supportive society; a more universal and tolerant society vis-à-vis a more individualistic and intolerant society; society with humanized economic development with dehumanized economic development; the society that transfers the power of States to citizens or increases state control over citizens; a more peaceful society with constructive relations a more violent society with destructive relations; a society with autonomous and integrated individuals a society with dependent and non-integrated individuals. On the other hand, the dynamics of humanization, dehumanization in anthropogenesis were considered in two categories: complete development of human intellectual capacities limited development of such capacities; a humanity that promotes its innate human abilities or that acquire "post-human" capabilities.

Aoun's study (2017) draws a suggestive relationship about artificial intelligence and higher education. In the context of MIT, a reflection on this relationship indicates not only the interaction between the world of technology and humanistic thinking, but also the need to meet the challenges of the inevitable developments of AI. In this sense, a "robot-proof" education, Aoun argues, is not only concerned with filling the minds of students with great scientific

advances, but must also enhance the creative mentality and mental elasticity that allows inventing or creating valuable issues. for society.

One of the challenges indicated by Aoun (2017) is the need to establish the framework for a new discipline, Humanics, based on the innate strengths of the human being that prepares students to compete in a labor market in which intelligent machines work Together with human professionals. Thus, the need and challenges for higher education is to face new literacies: 1) data literacy to manage the flow of large volumes of data; 2) technological literacy to know how their machines work; 3) human literacy, humanics, communication and design to function as a human being: "The field of robotics is producing the most advanced generation of machines in history, so we need a disciplinary field that can do the same with beings humans (...) "the domain where machines cannot compete with us, namely the ability to be creative, enterprising, culturally agile, global, etc."

In the first event, a discussion space was opened on how intelligence can strengthen education ("How can artificial intelligence enhance education?"), Carried out in the beginning of 2019, allowed the deliberation around four key themes: 1) How ensure the inclusive and equitable use of artificial intelligence in education, 2) How to take advantage of artificial intelligence to improve education and learning; 3) How to promote the development of skills for jobs and life in the era of AI; 4) How to safeguard the transparent and auditable use of education data.

The second event held in March 2019 took as a starting point the concern about "the technological revolution that is already underway takes over people's lives and livelihoods" and raised some suggestive questions about artificial intelligence and the need to consider its limits and elements for its humanization: To what extent should we allow the machines to decide for us? Who writes the values and priorities in the algorithms of the machines? If an error in the calculation of artificial intelligence causes an accident, who is responsible? What are the limits, if any, of artificial intelligence?" UNESCO, 2019. Conference Presentation. Principles for artificial intelligence. Towards a humanistic approach?). In the same page of presentation of the conference the four sessions were indicated with their thematic plenaries to develop: 1) Challenges and opportunities of the AI; 2) Universality of AI; 3) Towards an ethical and human-centered artificial intelligence, 3) New architectures of international cooperation in artificial intelligence.

UNESCO in partnership with Profuturo of the Fundación Telefónica have developed and presented six challenges in the application of AI in education: "1) Develop a comprehensive public policy on AI for development; 2) Ensure

an inclusive and equitable use of AI in education; 3) Prepare teachers for an AI-driven education; 4) Develop inclusive and quality data systems; 5) Make research on AI in education meaningful; 6) Ethics and transparency in the collection, use and dissemination of data ". (Available at: <https://profuturo.education/profuturo-y-la-unesco-presentan-los-seis-retos-para-aplicar-la-inteligencia-artificial-en-la-educacion>).

The 083 report from Stanford University (2016) considers the domains that will be influenced and impacted with the advances and developments of AI: transportation, home robot services, health care, education, low-income communities, public safety , jobs and workplaces, training. The same Report indicates some of the advances made by AI and others that are underway in relation to education, its processes and actors. In studies and research in arts and other sciences we are already witnessing the recreation of past worlds and fictional worlds that allow them to interact with them. Advances in AI techniques have begun to blur the line between formal classroom education and individual learning processes and at the rate adaptable to each individual, indicating more individual learning approaches. On the other hand, you can also witness the current transition from printed books to digital media and increasingly "smart".

Stanford University, a pioneer in the discussion on the topic of human interaction with artificial intelligence machines, has created the HUMAN Center for artificial intelligence a couple of months ago. The purpose of this center is the investigation of the impact of artificial intelligence on humanity. (<https://hai.stanford.edu/research/human-impact>) Various scenarios in which you can see some advances and immersions in experiences with intelligent systems can already show some of the contributions of AI to educational processes: personalization of training and learning; interaction with intelligent tutoring systems; access to networks and information; automation of academic-administrative processes; openness and unlimited availability of educational resources; integration of new technologies in the classroom.

Conceptual references on humanism

The conceptual framework of humanism is based on the references and approaches of humanistic thinking of representative authors from the international arena. Martha Nussbaum (2010; 2014), Adela Cortina (2013) José L. Molinuevo (2004) and Joseph Aoun (2017), allow us to define the conceptual references for the analysis of humanist challenges that artificial intelligence and robotics can pose. Molinuevo and Aoun agree on creativity and freedom as two fundamental aspects in humanization. The scope of Aoun's thinking (2017) is to consider the need for a new, humanic literacy to face

artificial intelligence where creativity and entrepreneurship are aspects of the human being that cannot be developed by the most sophisticated robot.

Cortina's approach (2013, p. 2214ss) in relation to the contribution of the humanities to the formation of social and human fabric indicates some aspects that are taken as a conceptual reference. On the one hand, the relationship between subjects or intersubjectivities that is "the link between subjects each with their peculiar identity, subjects that need to recognize each other", and that are determined as something "more than the sum of them, because it opens the way of freedom".

Critical thinking (Nussbaum) and "public use of reason" (Cortina) are two humanistic references that can also be challenged by robotics and that make a suggestive aspect for the research proposal. Nussbaum's (2010) reference about critical thinking in human formation is indicated by his need for "independent action and for the development of a resilient intelligence before the power of authority and blind traditions" (p. 11). This rational dimension is linked to another aspect underlined in humanistic thinking: personal responsibility or in terms of Nussbaum a "responsible citizenship" (2010, p. 130)

The other fundamental aspect of humanistic thinking is related to the emotional dimension of the human being. The understanding or "narrative imagination" of Nussbaum (2010) is determined as the "ability to think what it would be like to be in the place of another person, to interpret that person's story with intelligence and to understand feelings, desires and feelings. expectations that person could have" (p. 132). Emotional development as a fundamental factor in social construction and in the formation of citizenship is a fundamental aspect in the work of Nussbaum (2014).

Critical thinking (Nussbaum) and "public use of reason" (Cortina) are two humanistic references that can also be challenged by robotics and that make a suggestive aspect for the research proposal. Nussbaum's (2010) reference about critical thinking in human formation is indicated by his need for "independent action and for the development of a resilient intelligence before the power of authority and blind traditions" (p. 11). This rational dimension is linked to another aspect underlined in humanistic thinking: personal responsibility or in terms of Nussbaum a "responsible citizenship" (2010, p. 130)

Humanist challenges are determined by the possible and, in some cases, already evident impacts of artificial intelligence and robotics to some of these

humanizing aspects and the challenges that robotics could lead to conscious and unconscious processes of humanization or dehumanization. The determination of robotics is linked to social and personal interaction with human beings and its challenging incidence to what builds and develops humanization or dehumanization processes

The research

The project handles the categories: challenges, disadvantages, and advantages of artificial intelligence. In that sense it is necessary to define some criteria.

Artificial intelligence is a multidisciplinary science that encompasses many different fields such as mathematics, logic, computer science, psychology, sociology and in the field at hand, of course, bioethics. Artificial intelligence is then that discipline that deals with ensuring that computers are capable of performing tasks that human beings do, and in general perfect them so that there is no room for errors that clumsiness, carelessness and neglect (Diaz. V. Guerra Y 2019).

At first, artificial intelligence was understood as the programming of a computer to perform tasks that the human mind is capable of performing, but in that first conception it was not taken into account that the human mind performs tasks mechanically that do not imply per se intelligence, example: breathe. Then the term was changed to computer programming to perform tasks that, if performed by a human being, would require a mental process.

Researchers in artificial intelligence assume that the human being is equal to any living being on earth but with different complexity in its functioning. This definition is what makes the human being a machine that can be duplicated (Diaz V. Guerra Y 2019)

For engineers and mathematicians dedicated to the development of artificial intelligence, the brain is nothing more than a computer system that can be characterized and imitated by another system. This assumption has made software developers imitate common sense, of which we are endowed with human beings, but they have not been able to imitate other variables that also justify, to a large extent, the decision-making process of human beings: motivation and emotions

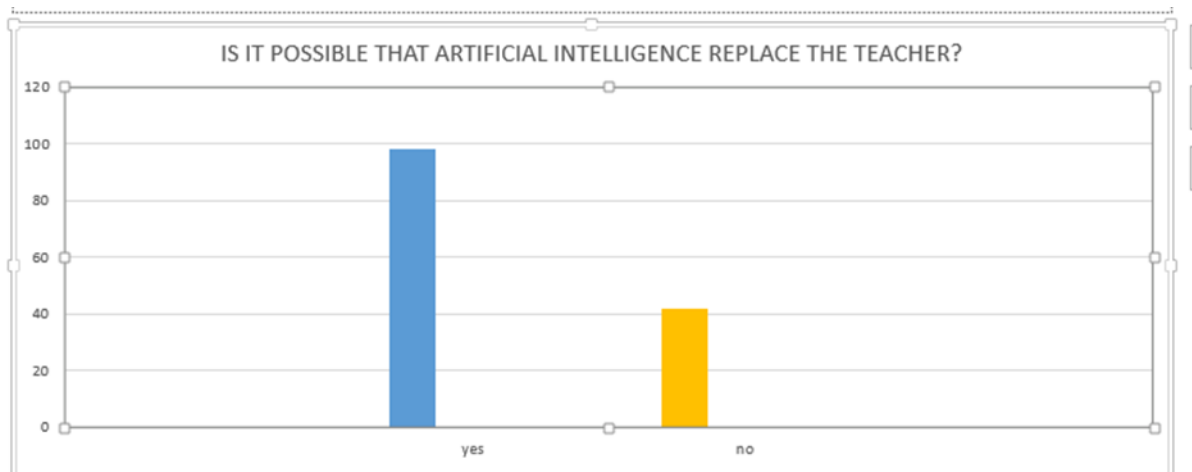
The research applies a survey to 140 teachers of levels of masters in education and PhD. Some surveys were also applied to school teachers.

The questions to ask were some open and others closed. Among the closed questions were:

Can artificial intelligence replace the teacher in the classroom?

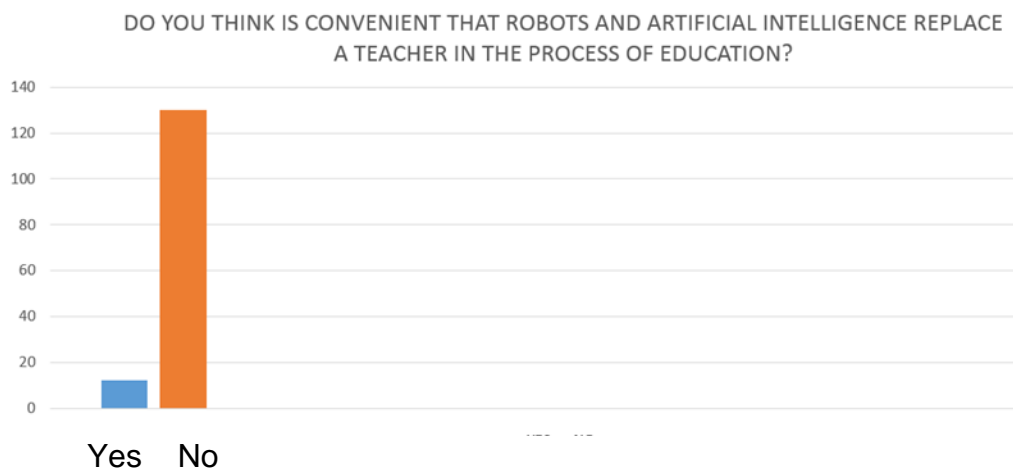
98 teachers answer that it is possible that artificial intelligence replaces the teacher in the classroom.

42 teachers answer that it is not possible.



The next question has to do with the desirability that artificial intelligence and robotics replace human teachers in the classroom or in the education processes.

12 Teachers said that if it is convenient while 130 professors said that it is not convenient that robotics and artificial intelligence in general replace the teacher in the classroom and in general in the education processes



What are the challenges and challenges that the student must face in front of a robot teacher or with an artificial intelligence medium that is not a human teacher.

It was found that 98 professors mentioned the lack of leadership generated by a robot or the use of artificial intelligence in education processes

64 mentioned the coldness in response of the students to their environment and their peers, that the process of education at the hands of robots or artificial intelligence would bring the students

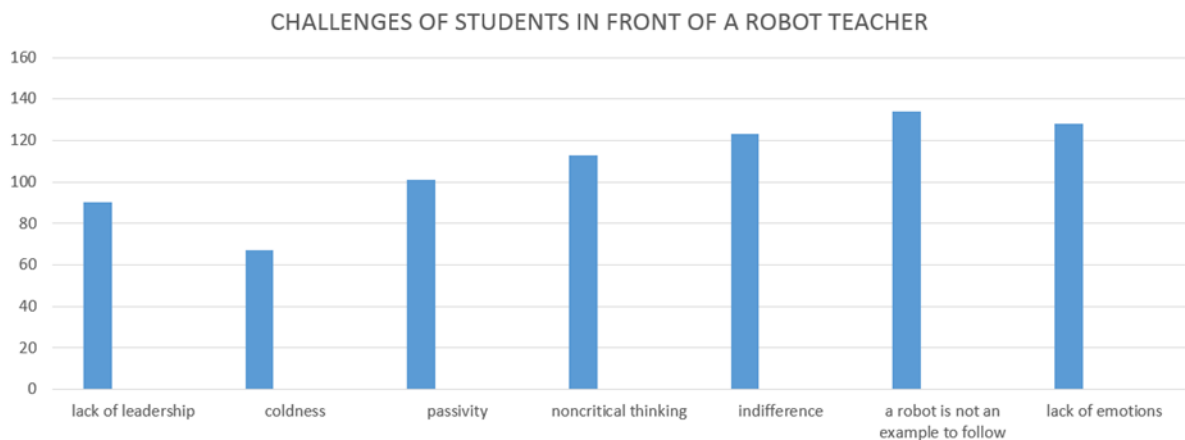
101 professors mention passivity as a consequence of teaching-learning processes in the hands of robots or artificial intelligence.

113 teachers say that critical thinking is not stimulated through the use of robots in classrooms.

122 teachers mention the student's indifference to their environment, their peers and the planet in general as a logical consequence of educational mediations with robots in the classroom or with artificial intelligence instruments.

133 professors mention that a robot is not an example of life to be followed in life. It does not provide human competencies to face emotions effectively. Quite the opposite.

124 teachers mention emotions as an important factor that would be affected in the process of teaching learning through robots.



Conclusions

Artificial intelligence and robotics taken to the extreme contain dangers and challenges that must be considered in all areas of their application, particularly in education.

The use of robots and artificial intelligence instruments can generate disconnection with emotions, students and teachers state that a robot is not imitable because it also lacks emotions.

There were more dangers and disadvantages that were found with the indiscriminate application of robotics and artificial intelligence in education.

Teachers fear not only that their positions will be replaced but also that a robot cannot closely monitor the personalized advances of each of the students in their classes.

A robot can never accommodate their emotions, since it lacks them, to provide what each student needs in particular considering the limitations and potential of each. Human teachers make personalized efforts for each of their students in order to achieve successful, in learning processes, that will never be achieved by a robot.

Robots and artificial intelligence are not models worthy of imitation for humans

It is necessary to be cautious and take necessary precautions so that robots and artificial intelligence never dominate situations without human supervision, especially in matters of education.

References

Anderson, T. (2016). Theories for Learning with Emerging Technologies In *Emergence and innovation in digital learning* (3-16). Edmonton: Athabasca University Press.

Aoun, J. (2017) Robot-proof. Higher education in the age of artificial Intelligence. Northeastern University. Boston MA. USA.

Bartolomé, A.R., Bellver, C., Castañeda, L. Adell, J. (2017). Blockchain en educación: introducción y crítica al estado de la cuestión. *EDUTEC, Revista Electrónica de Tecnología*. (61), a363-a363.

Balkin, J. (May 10, 2015). The Path of Robotics Law. California Law Review, Forthcoming; Yale Law School, Public Law Research Paper No. 536. Disponible en SSRN: <https://ssrn.com/abstract=2586570>

Barrientos, A. (1997). Fundamentos de robótica. Madrid: McGRAW-HILL

Barrios Tao, H. (2015). Subjetividades en el ágora digital: Cuestiones para la educación y la bioética. *Revista Latinoamericana de Bioética*, Vol. 15 No 29, 84-95.

Bengio, Y., Courville, A., & Vincent, P. (2013). Representation learning: A review and new perspectives. *IEEE transactions on pattern analysis and machine intelligence*, 35(8), 1798-1828.

Benítez, R., Escudero, G. Kanaan, S. Massip, R. (2014). *Inteligencia Artificial Avanzada*. Editorial UOC: Universidad de Cataluña.

Beverley, J. (2004). *Subalternidad y representación: debates en teoría cultural* (No. 12). Iberoamericana.

Boude Figueredo, O. R. (2013). Tecnologías emergentes en la educación: una experiencia de formación de docentes que fomenta el diseño de ambientes de aprendizaje. *Educação & Sociedade*, 34(123).

Bresnick, J. (2019) Arguing the pros and cons of artificial intelligence in health care. <https://healthitanalytics.com/news/arguing-the-pros-and-cons-of-artificial-intelligence-in-healthcare>

Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. New York: W.W. Norton & Company.

Bukowsky Ch. 1977 *Notes from a dirty old man*. Black Sparrow Press. United States.

Cantwell, M. 2017. Bill about AI. Available at: <https://www.cantwell.senate.gov/imo/media/doc/The%20FUTURE%20of%20AI%20Act%20Introduction%20Text.pdf>

Capek, K. (2004). *RUR (Rossum's universal robots)*. New York: Penguin.

Carsten, B. (2004). Information, Ethics, and Computers: The Problem of Autonomous Moral Agents. *Minds and Machines*, 14, 67-83.

Cortina, A. (2013). El futuro de las humanidades. *Revista Chilena de Literatura*, No 84, 207-217.

Cuthbertson, A. 2017. Tokyo: Artificial Intelligence 'BOY' SHIBUYA MIRAI Becomes World's First AI Bot to Be Granted Residency. Available at: <http://www.newsweek.com/tokyo-residency-artificial-intelligence-boy-shibuya-mirai-702382>

Czarnecki, K. 2017. English Translation of the German Road Traffic Act Amendment Regulating the Use of "Motor Vehicles with Highly or Fully Automated Driving Function" from July 17, 2017. Available at: https://www.researchgate.net/profile/Krzysztof_Czarnecki3/publication/320813344

Diaz, V. Guerra Y 2019. Emerging pedagogies and emerging technologies: general panning. Vol. 163, Issue. 9 of SYLWAN journal (ISSN: 0039-7660)

Díaz V. Guerra Y. 2019. Tensions and eclecticism in post pedagogical rhetoric: decolonial criticism to emerging pedagogies. *Artic journal*. 2019 72(8) (ISSN: 0004-0843)

Dredge, S. (2015) Robear: the bear-shaped nursing robot who'll look after you when you get old Japanese robot can lift patients from beds into wheelchairs or help them to stand up, promising 'powerful yet gentle care' for the elderly. In the Guardian.
<https://www.theguardian.com/technology/2015/feb/27/robear-bear-shaped-nursing-care-robot>

Durán Suárez, J. (2017). Redes neuronales convolucionales en R : Reconocimiento de caracteres escritos a mano. (Trabajo Fin de Grado Inédito). Universidad de Sevilla, Sevilla

Fefegha, A. (2019). Racial Bias and Gender Bias Examples in AI systems. Revisado desde <https://medium.com/thoughts-and-reflections/racial-bias-and-gender-bias-examples-in-ai-systems-7211e4c166a1>

Ford, M. (2015). *The rise of the robots: Technology and the threat of mass unemployment*. Londres: Oneworld publications.

Frankl V. 1945. *El hombre en busca de sentido*, Editorial Herder Barcelona

Guerra, A. y García-Mayor, R. (2018). Retos éticos que plantea el uso de la inteligencia artificial en el diagnóstico y tratamiento clínico. *Cuadernos de Bioética*, 29(97), 303-304.

Guerra Y et all (2018) *Dilemas éticos para la toma de decisiones en tiempos de Guerra*. Editorial Ciencia y Derecho Bogotá.

Harari, Y. N. (2018). *21 Lessons for the 21st Century*. Londres: Random House.
[.https://static.googleusercontent.com/media/edu.google.com/es//pdfs/Intelligence-Unleashed-Publication.pdf](https://static.googleusercontent.com/media/edu.google.com/es//pdfs/Intelligence-Unleashed-Publication.pdf)

Kapek, R.U.R. *Rossum's Universal Robot*. Praga: F.R. Borový, 1935

Karnow, C. E. (2016). *The application of traditional tort theory to embodied machine intelligence*. En *Robot Law*. Edward Elgar Publishing.

León, G. C. y Viña, S. M. (2017). La inteligencia artificial en la educación superior. Oportunidades y Amenazas. *INNOVA Research Journal*, 2 (8), 412-422.

Luckin, R., Holmes, W., Griffiths, M. & Forcier, L.B. (2016). *Intelligence Unleashed. An argument for AI in Education*. Stanford University. Disponible en:

Millar, J., & Kerr, I. R. (2013). *Delegation, Relinquishment and Responsibility: The Prospect of Expert Robots*.

Disponible en SSRN: <https://ssrn.com/abstract=2234645> or <http://dx.doi.org/10.2139/ssrn.22346>

Mannes, J. 2017. DoNotPay launches 1,000 new bots to help you with your legal problems. Available at: <https://techcrunch.com/2017/07/12/donotpay-launches-1000-new-bots-to-help-you-with-your-legal-problems>

Nationality Law of Japan (1950-2008). 2018. Available at: <http://www.moj.go.jp/ENGLISH/information/tnl-01.html>

Neznamov, A., Naumov, V. 2017. Model Convention on Robotics and AI. Available at: http://robopravo.ru/matierialy_dlja_skachivaniia#ul-id-4-35

Nikolova, V.L., Rodionov, G.D., Afanasyeva, V.N. 2017. Impact of Globalization on Innovation Project Risks Estimation. *European Research Studies Journal*, 20(2B), 396-410.

Molinuevo, J. L. (2004). *Humanismo y nuevas tecnologías*. Madrid: Alianza.

Navarro, S. N. (2016). Smart robots y otras máquinas inteligentes en nuestra vida cotidiana. *Revista CESCO de Derecho de Consumo*, (20), 82-109.

Nussbaum, M. (2010). *Sin fines de lucro, Por qué la democracia necesita de las humanidades*. Madrid: Katz editores.

Nussbaum, M. (2014). *Emociones políticas. ¿Por qué el amor es importante para la justicia?* Barcelona: Paidós.

Ocaña-Fernandez, Y., Valenzuela-Fernandez, L., & Garro-Aburto, L. (2019). Inteligencia artificial y sus implicaciones en la educación superior. *Propósitos y Representaciones*, 7(2). Doi: <http://dx.doi.org/10.20511/pyr2019.v7n2.274>

RAE. (2019). Definición de "robot". Disponible en <https://dle.rae.es/?id=WYRIhzm>

Rueda, R. (2012). Educación y cibercultura: retos para (re)pensar la escuela hoy. *Revista Educación y Pedagogía*, Vol. 24, No 62, 157-171.

Santos Reyes, J. & Duro Fernández, R. (2005). *Evolución artificial y robótica autónoma*. México: Alfaomega Ra-Ma.

Shed, S. 2017. The House of Lords is going to carry out a public inquiry. *Business Insider*, July 20. Available at: <http://uk.businessinsider.com/house-of-lords-to-carry-out-public-inquiry-into-ai-advances-2017-7>

Stanford University (2016). *Artificial Intelligence and Life in 2030*. Report 083. Disponible en:

https://ai100.stanford.edu/sites/g/files/sbiybj9861/f/ai_100_report_0831fnl.pdf

Schulz A, Nakamoto, K (2013) Patient behavior and the benefits of artificial intelligence: The perils of “dangerous” literacy and illusory patient empowerment. en Elsevier. *Patient Education and Counseling*. journal homepage: www.elsevier.com/locate/pateducou

Velarde Hermida, O. y Casas-Mas B. (2019). An Empirical Review on the Effects of ICT on the Humanist Thinking. *Observatorio (OBS*) Journal*, 13 (1), 153-171.

svetkova, I. 2017. AI in Court, lawyer bot in court, and legal disputes crowdfunding – LegalTech – revolution begins. Available at: <https://rb.ru/opinion/legaltech/>

Yastrebov, O. 2017. Discussion on prerequisites to assign robotics with the status of legal personality. *Questions of Legal Science*, 1, 189-202.

Vovchenko, G.N., Andreeva, V.A., Orobinskiy, S.A. and Filippov, M.Y. 2017. Competitive Advantages of Financial Transactions on the Basis of the Blockchain Technology in Digital Economy. *European Research Studies Journal*, 20(3B), 193-212.