ARTIFICIAL INTELLIGENCE AND THE CHALLENGES FOR TEACHERS: PROMOTING THE THREE “C’S” OF 21ST CENTURY LEARNING

A INTELIGÊNCIA ARTIFICIAL E OS DESAFIOS DO DOCENTE: PROMOVER OS TRÊS “C” DA APRENDIZAGEM DO SÉCULO XXI

LA INTELIGENCIA ARTIFICIAL Y LOS RETOS DEL DOCENTE: PROMOVER LAS TRES “C” DEL APRENDIZAJE DEL SIGLO XXI

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ABSTRACT

The 21st-century teacher faces major challenges in the educational field, one of the most significant being the proper use of artificial intelligence. Teachers must empower themselves with this technology so that it can assist them with operational tasks such as planning, designing resources, reviewing activities, among others, allowing them to dedicate more time to what is most important in students’ education: empowering them with the three “C’s” — curiosity, creativity, and critical thinking — which AI cannot develop, but teachers can. The objective of this publication is to reflect upon and support the idea that the teacher’s role should focus on the human dimension of the student, preparing them for a near future in which they must demonstrate these competencies, rather than merely serving as repositories of information, since teachers cannot compete with AI in terms of stored information capacity. Therefore, educators should focus their role on this mission and stop evaluating and teaching through “bulimic” and “vomitive” examinations. In this way, students will be prepared to face a society in which teamwork, empathetic communication, creative proposals, analysis, and criterion-based problem-solving are essential. This is where teachers should invest their time when AI frees them from operational and routine tasks, empowering themselves and relying on this technology as support.

Keywords: Artificial Intelligence. Teacher. Challenges. Learning. Education.

RESUMO

O docente do século XXI enfrenta grandes desafios no campo educacional, sendo um dos mais significativos, e que requer atenção, o uso adequado da inteligência artificial. Os professores devem se apropriar dessa tecnologia para que ela os auxilie em tarefas operacionais, como planejamento, elaboração de recursos, revisão de atividades, entre outras, permitindo-lhes dedicar mais tempo ao que é mais importante na formação dos estudantes: capacitá-los com os três “C” — curiosidade, criatividade e pensamento crítico — algo que a IA não pode fazer, mas o docente sim. O objetivo desta publicação é refletir e sustentar a ideia de que o papel do professor deve estar centrado na dimensão humana do estudante, preparando-o para um futuro próximo no qual precisará demonstrar essas

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competências, e não apenas atuar como um repositório de informações, já que não pode competir com a IA em capacidade de armazenamento de dados. Por isso, os docentes devem concentrar sua função nessa missão e deixar de avaliar e ensinar da forma como fazem atualmente, com exames “bulímicos” e “vomitivos”. Dessa maneira, os estudantes estarão preparados para enfrentar uma sociedade em que o trabalho em equipe, a comunicação empática, a elaboração de propostas criativas, a análise e a solução de problemas com pensamento crítico serão fundamentais. É nisso que os professores devem investir seu tempo quando a IA os libera de tarefas operacionais e rotineiras, apropriando-se dela e utilizando-a como apoio.

Palavras-chave: Inteligência Artificial. Docente. Desafios. Aprendizagem. Educação.

RESUMEN

El docente del siglo XXI se enfrenta a grandes retos en el ámbito educativo, uno de los más significativos y que requiere atención es el uso adecuado de la inteligencia artificial, empoderándose de esta para que lo ayude en tareas operativas como la planificación, el diseño de recursos, revisiones de actividades, entre otras, y que le quede tiempo libre para dedicarlo a lo más importante en la formación de los estudiantes, que es empoderarlos con las tres “C”: curiosidad, creatividad y pensamiento crítico, que la IA no lo puede hacer, pero el docente sí. El objetivo de esta publicación es reflexionar y sustentar de esta manera que el rol del docente se debe centrar en la parte humana del estudiante, prepararlo para el futuro cercano en el que tiene que demostrar estas competencias y no solo ser un repositorio de información, ya que no puede competir con la IA en capacidad de información almacenada, por eso los docentes deben enfocar su función en eso, y dejar de evaluar y enseñar como lo hacen, con exámenes bulímicos y vomitivos. As así, que los estudiantes se van a enfrentar a una sociedad donde se trabaje en equipo, se comunique de manera empática, realice propuestas creativas, analice y dé soluciones con nivel criterial, eso es en lo que los docentes deben invertir su tiempo cuando la IA los libera de tareas operativas y rutinarias, empoderándose y apoyándose en ella.

Palabras clave: Inteligencia Artificial. Docente. Retos. Aprendizaje. Educación.

1 INTRODUCTION

All of us who are immersed in the academic world know that teaching in times of AI is a great challenge, because education is supported and empowered by technology, but it is the responsibility of the teacher to apply it effectively, innovatively, ethically and with educational disruption. Education in all its areas and educational levels implements the use of Artificial Intelligence, but it is not only necessary to know tools, but also to have the ability to apply the strategies and methodologies that allow it to be used well.

While it is true that artificial intelligence has existed for a long time, practically since the appearance of web 2.0, *e-learning* and other technological developments, it has been advancing each time, as has the knowledge society, generating multiple challenges, especially for teachers, both university and other educational levels. Therefore, we must look carefully at all those elements and factors that can help us to be better teachers and managers of education. The objective of this publication is not only to reflect but also to sustain that the role of the teacher should focus on the human part of the student, preparing him for the future where he must demonstrate these competencies and empathetic leadership.

2 ARTIFICIAL INTELLIGENCE AND TEACHER CHALLENGES

The topic I will address is artificial intelligence and the challenges of the teacher. To begin with, I start from a very important idea: *times change... universities too*. That's right, dear colleagues, readers, universities must move hand in hand with technology; We cannot stand on the sidelines. Think, for example, of how cinema has changed: we used to have to go to a cinema in person, and now we have streaming platforms such as Netflix. In transportation, we have applications such as Didi, Uber or Cabify. When it comes to shopping, there are platforms such as Temu, AliExpress or Amazon. Technology, science and artificial intelligence have advanced in all areas of work, business, personal, and of course, also in education, where you and I are involved.

Education must go hand in hand with these advances and take advantage of them to empower not only teachers, but also to benefit the essence of our work: students. Therefore, if times change, universities must do the same. They cannot be left behind; must accompany this process of transformation, otherwise they would represent a setback for educational environments.

Artificial intelligence, as I mentioned, has brought us great challenges in different areas: in companies, commerce, technology, the home and, of course, in education. It has an essential characteristic: it seeks to carry out activities that, operationally, human beings perform in their

work or in any environment. From this, we can identify thousands of AI-based tools, and more applications are constantly being created. I will mention six of them, only six, because the complete list would be endless. These will help us to reflect on how we can empower ourselves as teachers, especially in operational tasks.

Figure 1

AI frees up operational activities

Source: Authors.

The first is Squirrel Ai Learning. This tool, originated in Shanghai, China, more than fifteen years ago, has recently entered the American market for a very interesting reason: it offers students at all levels, from elementary school to university, a virtual teacher available outside of class hours. This online teacher, an avatar with artificial intelligence, helps to review the topics developed according to the level and learning style of each student. In this way, it reinforces the contents worked on by the teacher, acting as an assistant or assistant teacher. It is like having, many of us know from experience, a head of practice or assistant at the university who supports the teacher. This virtual assistant, on the other hand, helps the student to improve their skills according to their level and needs.

The second tool is DreamBox, very similar to Squirrel Ai Learning, but with a focus on learning styles and levels. There are students who learn best by listening, others by visualizing, and others through more kinesthetic activities. DreamBox, through artificial intelligence, offers personalized accompaniment, allowing the student to advance and review at their own pace. In addition, it gives the teacher the possibility of visualizing the progress of their students: what level they are at, how they have improved and what aspects require reinforcement. In this way, the teacher can better prepare their next sessions, providing feedback and consolidating learning.

The third tool I want to mention is Gradescope, a great ally in task review. This platform allows students to automatically provide feedback, even based on previously defined rubrics. Thus, those operational tasks that would take us hours or even days when we have 60, 100 or 150 students can be solved in much less time.

These three tools are examples of applications that help in operational tasks, freeing up time for the teacher to focus on deeper aspects of the educational process. In addition to these, there are four others, which I am sure we all know**:** Turnitin, ChatGPT, Duolingo and Gemini.

Turnitin, widely used, works with artificial intelligence to support the detection of plagiarism and the correct use of citations and references in research papers, theses or essays. ChatGPT, a classic of recent years, has become a tool that offers fast and fluid information, facilitating search, writing and analysis processes. Gemini, which has become our smart assistant in the palm of your hand. Finally, Duolingo, which combines artificial intelligence with gamification, allows you to learn different languages in a playful and personalized way. With motivational messages such as "Okay, you can do it!" or "Congratulations!", the system awards rewards, stars and progress levels, adjusting the challenges according to the user's individual progress.

These seven tools, three more specialized and four widely known, represent just a sample of the possibilities offered by artificial intelligence in the educational field. However, they reveal a great pending challenge: teacher training. There are hundreds, even thousands of tools that neither you nor I know yet, because new ones are constantly being created for different areas: history, mathematics, English, among many others. We are getting to know some of them according to our field, but there is still much to discover. But what does the professor, the university professor, the teacher at all levels, need to be able to empower themselves with these tools? You need to be trained.

A survey conducted in 2025 asked the question: *Is artificial intelligence important in education?* And the results were very revealing. Four Latin American countries—Peru, Mexico, Chile, and Argentina—as well as Spain, identified teacher training as a prevailing need. Of course it is, and not only in the sense of knowing tools, because that today can be learned with a click on YouTube or Google, but in how to really empower ourselves with them, how to select the most appropriate ones according to our area or subject. If I am an engineer, psychologist, lawyer, history or literature teacher, I must identify the tools that respond to my needs, applying approaches and methodologies that help me form better human beings. That is the part that artificial intelligence does not provide, and that is precisely why teacher training is so necessary in our Latin American countries. And it's good that it's recognized like this, because it's urgent.

In addition, this training should not depend solely on a director, rector or ministry enrolling us in courses or workshops. We must also self-manage our own training. We have a huge amount of resources available: databases, YouTube channels, free webinars, conferences, online congresses and much more. Therefore, it is essential to empower ourselves and take responsibility for our own training, in addition to that offered by the educational institutions where we work.

Figure 2

Challenges of the teacher in times of AI

Source: Authors.

3 THE THREE C'S OF HUMAN LEARNING

But training should not be limited to knowledge of operational tools. It must also focus on what I call the three "Cs" of humanization. Artificial intelligence can be very efficient and handle enormous amounts of information, we have it on our smartphones, just a click away, but it lacks creativity, awareness and human compassion. Artificial intelligence cannot offer that, but teachers do. We have emotions, empathy, the ability to accompany students in their process, whether in face-to-face, virtual or blended environments. That is the shortcoming that artificial intelligence does not cover and that we must assume as educators. Therefore, there is a great challenge here: the teacher must be creative, have awareness and critical analysis, and demonstrate human compassion in different situations.

Teachers are leaders in society, and we must manage this entire technological process, empowering ourselves with artificial intelligence not to replace what we do, but to free ourselves from operational tasks. As I mentioned before, technology tools can help us reduce the time spent on practical tasks that are often long or tedious, such as reviewing or giving feedback on work, making materials, or taking notes. By using artificial intelligence for these tasks, we can dedicate more time to the essence of our work: reinforcing ethics, morals, values, teamwork

and coexistence. We live in society, and our students will go out to live and work in society, in universities, companies and institutions. That is why we must promote empathy, warmth and creativity from a young age, so that when they reach university they already bring that innovative spirit. And if they don't, it's up to us to encourage it in them.

Empowering ourselves with artificial intelligence allows us to free ourselves from operational tasks and focus on what technology cannot replace: ethics, values, empathy, creativity and teamwork. This can save us up to 50% of the time we spend on the most routine tasks of the day-to-day, allowing us to focus on the human part of the educational process.

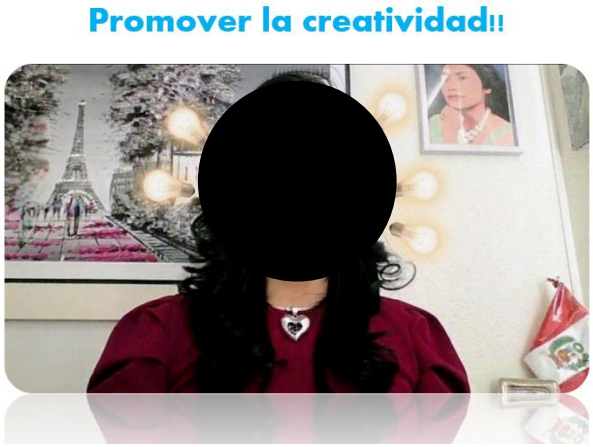
That human part is expressed in dialogue, in teamwork, in closeness with students: that "how are you guys, how are you doing, how can I help you?" We cannot limit ourselves only to the literal or technical aspects of the activities. We work with human beings, not with machines or robots. They feel emotions, joy, sadness; and we must be there, accompanying them.

However, in the world there are still schools and universities where some teachers, fortunately less and less, continue to work with their students as if they were robots, limiting themselves to filling them with repetitive information and applying exams over and over again, just to mark answers, literally. This makes the student an operative, monotonous being, and does not prepare him for the challenges of the future. Those teachers who continue with repetitive methods, constant exams and mechanical activities, are unwittingly training *human robots*, not real students. They want the student to accumulate information, but the question is: will a student be able to know more than Google, ChatGPT or other databases? Of course not. The student is a human being, not a memory machine. It can never exceed the amount of information that exists on the internet or in digital databases. Therefore, insisting on methodologies based on memorization only leads to competing with artificial intelligence, something impossible.

We should not train students who imitate artificial intelligence, but guide them to be better human beings, professionals who can work in a team, who are leaders, empathetic, creative, who can investigate, because in order to reach that creativity they have to start with curiosity from an early age. They must be guided towards what artificial intelligence cannot do. We need to empower them with the three "Cs": **curiosity, creativity, and critical thinking**.

Figure 3

Teachers must promote creativity



Source: Authors.

A student with critical thinking can be a leader, a great businessman, a principal, a teacher, an engineer, or a lawyer. Critical thinking gives you discernment, analysis, and creative ability. We need people who innovate, not repeat what they see every day. Innovation, we always say, is the key to success. However, many colleges and universities still apply repetitive exams. How do we expect students to be creative or innovative if we continue to teach mechanically?

Curiosity is the basis. I always say it, when I train primary school teachers, that if we promote curiosity in students from a young age, we will have much more competent students at university. A curious child asks, analyzes, compares, and creates. When that student reaches the higher level, he dazzles with his creativity and innovation. But if during his childhood he has received a rigid education, where he is told "don't paint like that", "don't draw like that", "don't feel like that", "don't look like that", when he gets to university he will ask "and how do I do it?", because all his life he was told how to do it. In other words, it did not develop creativity or innovation.

I know that each of you will say: "Yes, we receive students like that at the university." Unfortunately, we still receive them. So, our task, our challenge in universities, is very complex. Let's imagine the professionals who are being trained in the future: the groups of innovative, creative and empathetic teachers, and those who do not, those who continue with rigid activities, pretending that the student memorizes, learns, takes exams and repeats everything by heart. What will happen fifteen or twenty years from now? What will the challenge be like for them? They will not be able to face or function in a society that is going to devour them; they will not

be able to really develop. They will only be carriers of information, and we already know that the information is here in the click, in the palm of the hand, in all the applications we have.

We need students who are critical, strategic, creative, compassionate, humane, empathetic, who identify with how their partner feels, not who live their world mechanically. That's why we ask: "How are you guys? How are you? How have they done?" Before starting a face-to-face, virtual or blended class session, we should not start by saying: "Today we will address the history of...", but "How are you? How was your weekend? Is everything okay?" First, the human part. I know that will take us ten, fifteen or twenty minutes, but it is essential, because that is what artificial intelligence cannot do and we can. It is our task. If we humanize by example, empathize with example and motivate by example, we will train professionals who, although they will be experts in their field, will also, in essence, be empathetic human beings.

Education has a very long and challenging road ahead. The process that we have to go through is really complex, because there is a great debate in the world about technology, science and artificial intelligence: whether to use the *smartphone* or not, whether to take the cell phone to class, whether to allow the internet or not. While these issues are being discussed, science and the knowledge society continue to advance. We must go hand in hand, always remembering that technology, artificial intelligence and whatever comes tomorrow, which we do not know what it will be, are already among us.

Figure 4

Education has a long way to go

Source: Authors.

Today we have humanoid robots like Ameca, or like Sofía, who was in Virtual Educa. In Virtual Educa Sofia gave a lecture in a room that left the participants who listened to her shocked. We are surrounded by technology, but Sofía does not have the human warmth that

Dr. Milagros Huamán Castro has: "How are you? How are you?" showing a smile. That's the difference. Sofia has an incredible memory, with everything on Google in her memory, excellent. But we have something that she doesn't have. Education must address this, which is why all teachers must be committed to this change. The essence is not in learning to use artificial intelligence tools, that is simple; just as we learned Zoom or Moodle, it is not complex. The essence is to use them properly, without neglecting the human part, creativity, compassion and ethics. That is really the challenge of the teacher in this era of artificial intelligence.

This challenge requires our predisposition, the desire to relearn every day. To transform ourselves into this new essence, we must learn to unlearn in order to be able to constantly relearn, because tomorrow something different will appear and it will not be the same artificial intelligence. We will have to work with it, but the essential thing is to break our own paradigms.

Many times, in universities or colleges, we follow lifelong routes, and it is difficult for us to break those schemes. Many teachers find it difficult to do so, or want to break them, but they find themselves with institutions that follow outdated models. Or, the principal or rector wants to innovate, but some teachers are resistant, it is difficult for them. You have to train them once, twice, three times, motivate them. The task is arduous, both for those who manage and for teachers, because we all have to break the paradigms that bind us. And those paradigms are not in a book; they are in our way of thinking, in our decisions and in how we take on the new challenges brought by the society of knowledge, research and technology, where changes are constant. This calls us to constantly update ourselves and to stay at the forefront in our areas, subjects or professional careers.

The challenges are many. The first is to promote creativity, a great challenge for teachers in each of their subjects. You are an expert in engineering, economics, pedagogy, medicine, law, art or psychology: how do you promote creativity in your career, in postgraduate or in the doctorate? If you teach at school, how do you encourage it?

To propose activities that promote creativity, we must plan in advance. It is an essential step. If I am going to use artificial intelligence, I must have selected my tools, but also plan how I will promote creativity with students so that in the end each one contributes something different, something that artificial intelligence cannot contribute.

Motivation must also be permanent in our classrooms. Even when giving feedback, when we see that a job is wrong, we shouldn't say, "Peter, this job is a mess," no. We can say: "Pedro, I have seen that your work has not reached the expected competencies. Maybe you've been tired or distracted. I recommend you review this book, this article, and reflect to rethink it." Even in the most critical moments we must motivate.

Figure 5

Teachers must promote constant motivation

Source: Authors.

When students get the highest grade, we congratulate them, we give them a badge, a happy face. I, in graduate school, give badges to my doctoral students. But if the task is not right, we should not react negatively, emotionally abusing them. On the contrary, we must reflect with them: "I know that next time you will do well, I trust you, you can do it". This is how we motivate them to continue striving, because if not, they become demotivated and give up. Many students say, "I can't take it anymore," and it's not that they can't, but that they lack motivation. Sometimes they do not receive it at home, and it is we, the teachers, who must provide it, in postgraduate studies, in their careers or at school.

Another big challenge is empathy. Artificial intelligence cannot be empathetic or motivating or creative, but we can. We must ask them, "Are you wrong? Haven't you slept because you worked all night? Don't worry, rest." Ask them how they are, how they feel, what they need. And not only be empathetic with them, but promote empathy among students, so that they do not live individually, but learn to be empathetic with their classmates. That part is fundamental and we must promote it by example.

We must also promote collaboration. Many times students say: "No, Dr. Milagros, I work alone, I don't like to work in a team." We cannot say "it's okay", but guide them to understand the benefits of collaborative work, whether virtual or face-to-face. Teamwork strengthens the final product, because each one contributes from their area, it is finished faster and the result is better. In addition, the student learns that he will not live in isolation: he will live in society, and

when he graduates as an engineer, accountant, doctor, pedagogue, communicator, economist, psychologist or mathematician, he will have to work in a team. That is why, from university or college, we must promote collaboration, mutual help and constant guidance, because they will live in society and must learn to overcome each challenge together.

The other great challenge is critical thinking. How much it costs us for the student to work on critical analysis. They almost always reach the literal level. In reading comprehension we have three levels: literal, inferential and criterial. Most students stay at the literal level, especially when it is only evaluated with memory tests, with alternatives A, B, C, or D. Those who continue to take repetitive exams make the student remain at that literal level, without advancing to the inferential level and even less to the critical. Critical thinking will help the student, when they graduate, to be a leader in the company, in their work or in any space where they work. It will give you the ability to discern, analyze, give your opinion, and make appropriate decisions in your professional life.

Promoting critical analysis in the classroom is an essential issue, and artificial intelligence cannot do it. We must have this reflection every day, together with our students, from the different subjects in which we accompany them.

Figure 6

AI will change the world

Source: Authors.

4 CONCLUSIONS

Artificial intelligence is, in its time, what electricity was. Before electricity, the world had another way of living: lighters, candles, candlesticks were used, people went to bed early. Then the world changed. Electricity not only brought light, but also appliances and everything that works today thanks to it.

Artificial intelligence has arrived in the same way: it has arrived in the world, in commerce, in cinema, in technology, in the environment, in education. But it is up to human beings to use it to improve the quality of life. In our environment, it depends on how the teacher is empowered by this tool, but as an operational support, not as a substitute. To know it in order to take advantage of it in routine tasks and, over time it frees us, to strengthen creativity, critical thinking and human awareness. The essence of the human being is what we will not find in artificial intelligence or in any of its tools.

As education professionals, we have that empathetic and motivating commitment to our students, and the permanent commitment to self-train to be able to give the best of ourselves, because they are our reason for being.

We must continue to research and reflect with a critical, disruptive and innovative look, because artificial intelligence, education and our role as teachers at this time is challenging and requires a commitment to human quality.

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