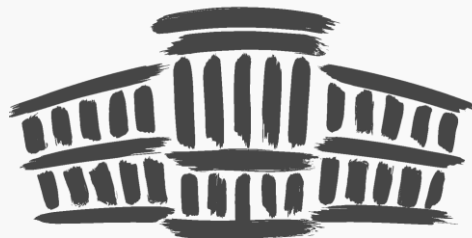


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2024



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THE FUTURE OF EDUCATION – THE ROLE OF ARTIFICIAL INTELLIGENCE

SZABÓNÉ BALOGH ÁGOTA

Gál Ferenc University, Szarvas, Hungary
szabone.balogh.agota@gfe.hu

Abstract

An important question today is what role artificial intelligence (AI) has in education and what opportunities it will have in the future. It can appear as software or optimized hardware. This role can be personalized learning, continuous assessment, feedback, virtual assistants, pattern and resource research, chat bots, sentiment analysis, or even voice or image recognition, subtitling. Based on international and own studies, the author describes the possibilities inherent in the learning and teaching process. It also points out the risks, limitations, and changes in the teacher's role.

Keywords: Artificial intelligence, AI, education

1. Introduction

Artificial Intelligence (AI) is also playing an important role in education in the 21st century. The field of AI is working to create intelligent machines with human-like capabilities. In American education, AI is increasingly used to support and enhance teaching and learning through intelligent interactive programs and technologies. In the US education sector report, experts predict that the use of AI will grow by 48.15% between 2022 and 2026 (Research and Markets, 2022). It can take the form of software or optimised hardware. This role can be personalised learning, continuous assessment, feedback, virtual assistants, pattern and resource search, chatbots, emotion analysis, or even voice or image recognition, captioning.

1.1 AI support in education

In 2019, Marcus Palmén interviewed two AI researchers, Rose Luckin and Keng Siau. According to Rose Luckin, AI has a dual role: intelligent infrastructure (e.g. underlying technology for online courses) and the technologies that power them (e.g. virtual reality, smartphones, robots). AI reveals learning mechanisms, strengths and weaknesses, allowing educators to optimise their work. According to Keng Siau, educational institutions will also benefit as AI will allow them to reduce the cost of quality education and train more people. It also greatly increases the gamification of learning. In their opinion, AI should be made available to the masses, but care should be taken to ensure that human interaction is also possible, i.e. with the support of educators. Another problem may be poorly designed AI, which does not take into account key learning aspects, it is important that educational applications are developed in collaboration with teachers and educational researchers (Palmén, 2019).

Artificial intelligence can be used in education in several areas, such as personalised learning, where the teacher can adapt in real time to the needs of the learner; continuous assessment, feedback (tests, open-ended questions); virtual assistants (real-time responses in class); pattern recognition, where problem solving comes to the fore; chatbots, e.g. parents can get automatic answers to their questions from administration; resource search, text analysis; support for children with special needs through image and voice recognition; emotion analysis (question-answer); drop-out; plagiarism check of literature. The following are the views of several experts on this subject.

1.2. Researchers' views on the emergence of AI systems in the schools of the future

AI systems can be applied in education in three areas (Kollár, 2023):

- Learning together with AI: AI is used to enhance the effectiveness of learning by complementing what the teacher is saying.
- Learning with AI: learning the skills needed to use AI.
- Learning to use AI: learning AI-related skills to use it effectively or even to create new technology (Kollár, 2023)

According to Linch (2018), AI has 7 important roles:

1. Automate grading: for example, in automated multiple-choice tests.
2. It supports teachers: e.g. communication, AI Chatbot.
3. Supports students: e.g. learning support with tutorials, in the future even an "AI companion". Personalised learning, knowing students' strengths and weaknesses.
4. Meeting diverse learner needs: e.g. helping students with special needs, developing social skills for ASD students.
5. Teacher in a motivational role alongside AI: the role of the teacher changes with the spread of AI, providing essential information to learners, becoming a motivator of learning.
6. Providing personalised support: AI also provides personalised coaching and learning for students outside the classroom. When students need to develop, strengthen their skills, abilities or implement their ideas, AI will be able to provide them with the tools to succeed.
7. Identify weaknesses in the classroom: for example, AI can identify when groups of students do not know or understand a subject and inform the teacher. In this way, AI informs teachers, helps them self-assess, and reinforces best teaching practices (Linch, 2018).

Prof. Dr. Charad Hassan presented a paper on "The Impact of Artificial Intelligence on the Digitalisation of Education" at the National Conference of Public Education Specialists 2020.

He highlighted five application areas where AI can play a role:

- the availability of teaching for everyone
- support for teaching,
- direct learning support, tutoring,
- personalised learning,
- administrative work (Hassan, 2020).

You can see the importance that researchers attach to the role of personalised learning, motivation and support for learning-to-teach. Learning in a digital environment is different from the traditional one, but at the same time electronic opportunities help to put the learner at the centre (Jaskóné, 2023).

Future schools need to create an environment for students where they can combine their creative intelligence with the analytical intelligence of computers and robots (Wagner, 2018).

According to Kyle Wagner (2018), there are five areas in which changes need to be made in educational institutions for AI to accelerate and support the teaching-learning process:

Facilitation/Coaching (Stand and give instructions): teachers should take on the role of mentor instead of frontal teaching. Personalised learning is facilitated by the individualised delivery and input of instructions into the virtual learning environment of the AI. This enables symbiotic collaboration between teachers, learners, machines.

Content developer, creator teachers become developers of learning experiences: in general, inflexible, rigid curricular frameworks have taken a lot of time and energy from teachers, less able to adapt to the individual level of learners. AI helps learners to access knowledge at a level appropriate to their ability, and can do the simple work for the teacher. They can also work in small groups, in a more personalised and human approach to solving problems. Meanwhile, the teacher can help stuck learners and easily monitor their progress.

Proliferation of virtual social networks: virtual networks help learners to connect with and learn from peers around the world. For example, Brainly, a Q&A social media site, connects users and allows them to discuss questions and problems related to a specific topic or subject.

Blended courses and personalised design instead of textbooks and fixed curricula: flexible processes facilitate learning, where instructors can create blended courses that combine coaching and content management through group chats, editable worksheets, videos.

The creation of lateral virtual global networks instead of hierarchical top-down networks: they help management, make administration easier, take up less of teachers' time. They will be able to attend virtual global conferences and training courses that best meet their needs for their professional development.

The main advantages are the speed of information acquisition, personalised teaching, support for learners with special needs, the possibility of integrated learning, the use of intelligent tutoring systems, the development of virtual learning environments, software grading systems, assessments even for essays, raising academic standards. Slowly and consciously, teachers learn to use and become able to apply AI. It is not something to be shied away from, but to be creatively integrated into teaching in a way that suits the needs of the learners.

Of course, there are both risks and limitations to using AI. These include the "fear factor", the fear of teachers that they will lose their jobs and are no longer needed. There are several programmes that allow self-learning, assessment of exams. There are also subject restrictions, such as in the arts and physical education. It reduces human interaction, i.e. students do not interact with each other in class, thus reducing their social and communication skills, making it difficult for them to find jobs and social contacts later on. They may also develop a lack of emotional intelligence.

The use of AI implies that students will be less interested in learning and more interested in AI systems, developing a kind of dependency. It can reduce students' thinking skills, especially critical thinking, by increasing their reliance on technology. Financial difficulties may arise in the purchase of equipment, training of professionals. "Maintenance" problems can also arise, due to the need to bring the knowledge base of the AI systems up to the appropriate level, and to develop appropriate coordination between technology systems.

Another difficulty is data security, as schools store large amounts of personal data that can be used by virtual assistants, so it is important for institutions to develop a data security strategy and regulation. Plagiarism risk can also be a problem. (Careerera, 2023, Foong, 2018)

2. Introduction

The aim of the study is to assess the level of awareness of AI among teachers and students. What and how AI is used and what they think about its role in education.

2.1. Method and sample of the study

The survey method is a questionnaire completed by 581 people between September and October 2024. The respondents were not only people in education, but anyone could fill in the questionnaire. Respondents were aged between 14 and 78. Figure 1 shows the age distribution. For the purpose of this study, only the responses of teachers and students are presented.

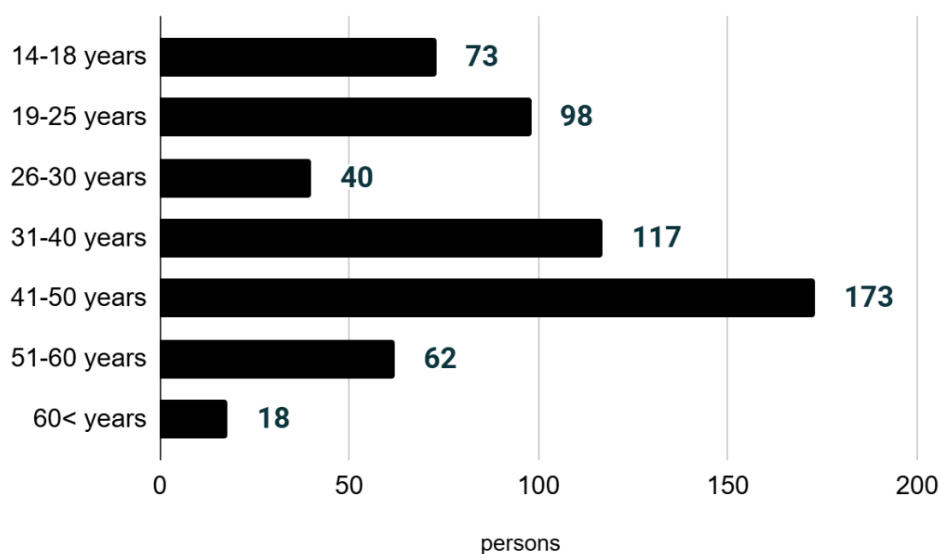


Figure 1: Distribution by age

The respondents included 65 secondary school students, 304 higher education students, 103 teachers, 96 people in other jobs, 2 unemployed and 11 retired. The responses from teachers (103) and students (369) are presented below.

2.2. Results

We asked the teachers and students who responded what they use AI for.

Responses:

- Google search 59.2%
- Translation tools 50%
- Text creation. 31%
- Voice, speech recognition 28.7%
- Image and illustration creation 27,7%
- Virtual assistant, AI chat: 27.4%
- Text from data 21,6%
- Stylistic enhancement 16.7%
- Not using anything: 15.5%
- Literature summary 11.6%
- Interactive quizzes, learning materials: 11.4%
- Music creation 10.2%

The most popular apps are ChatGPT 46.1% and Dulingo 44.6%.

What are the benefits of AI The answers to the question are shown in Figure 2.

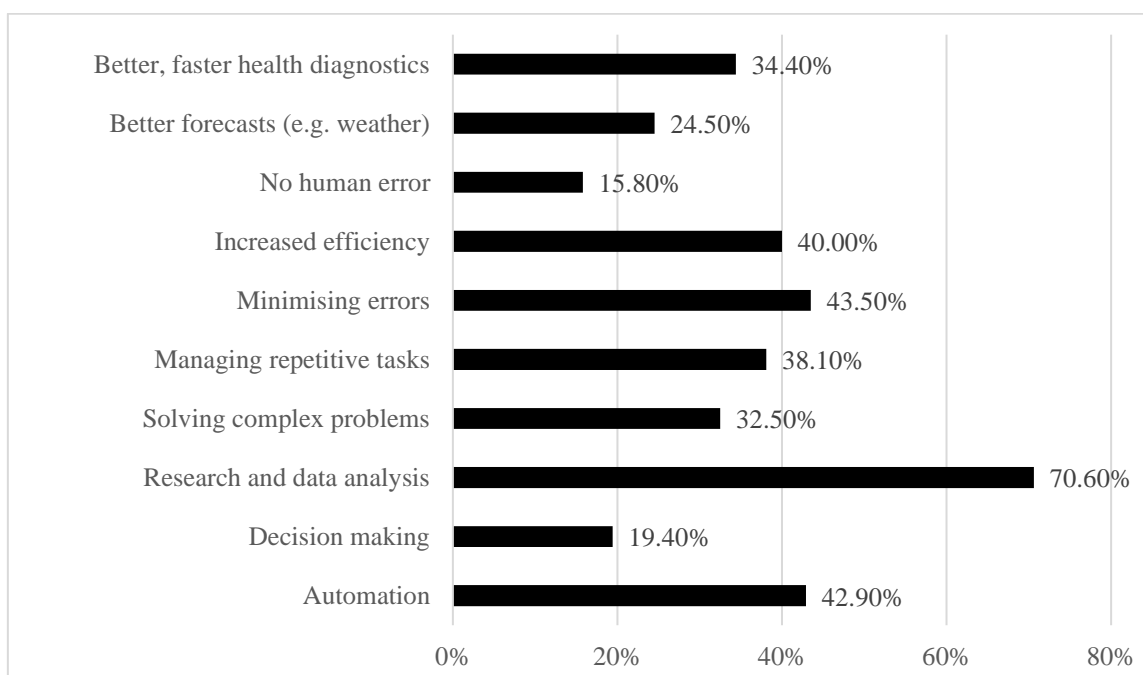


Figure 2: *What are the benefits of AI?*

Most common are: research and data analysis (70,6%), minimising errors (43,5%), automation (42,9%) and increased efficiency (40%).

The disadvantages of AI are shown in Figure 3.

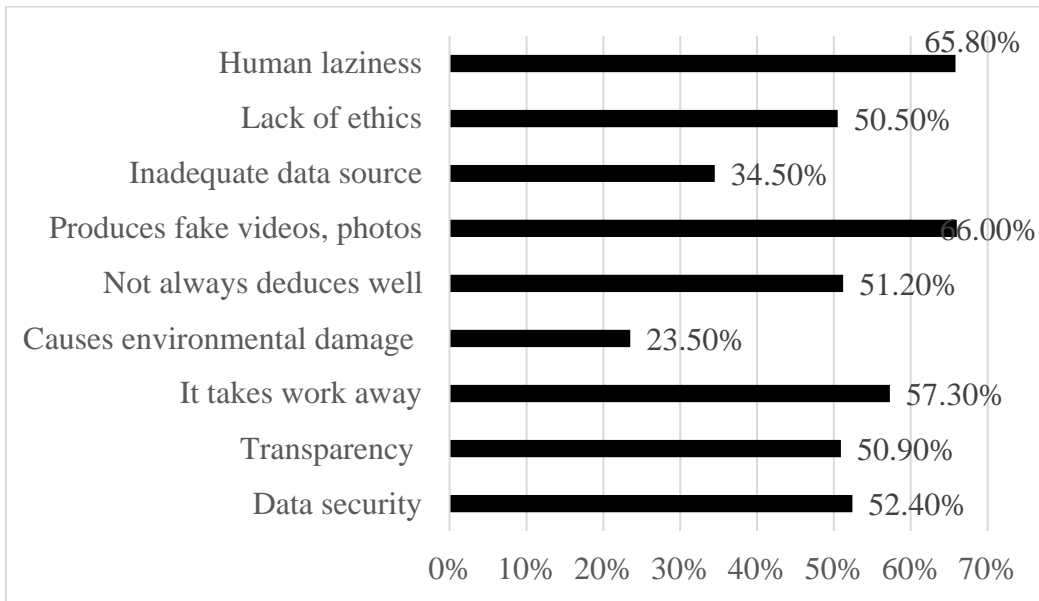


Figure 3: *What are the disadvantages of AI?*

Most common are: produces fake videos, photos (66%), human laziness (65,8%), it takes work away (57,3%) and data security (52,4%).

The use of artificial intelligence is not yet that common among teachers. Teachers' work and leisure habits have changed a little with the use of AI. Students use AI a little more than teachers, and their habits have changed more. True, this rate is not very high.

Figure 4 shows teachers' views on three sets of questions. 1 represents not at all, 5 represents very.

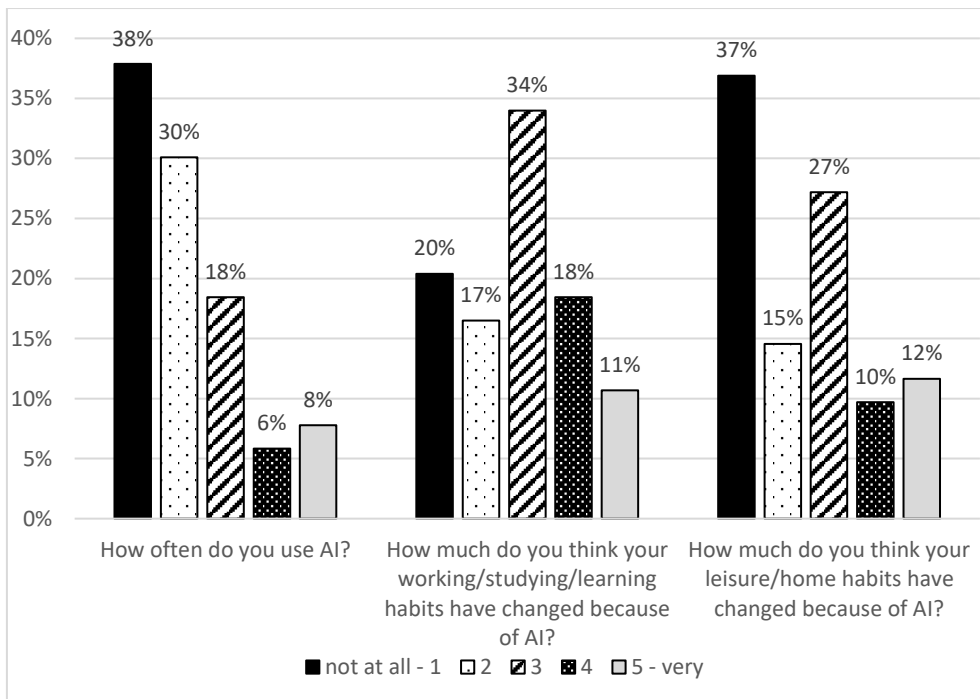


Figure 4: *Teachers' views*

Figure 5 shows students' opinions on three sets of questions. 1 represents not at all, 5 represents very.

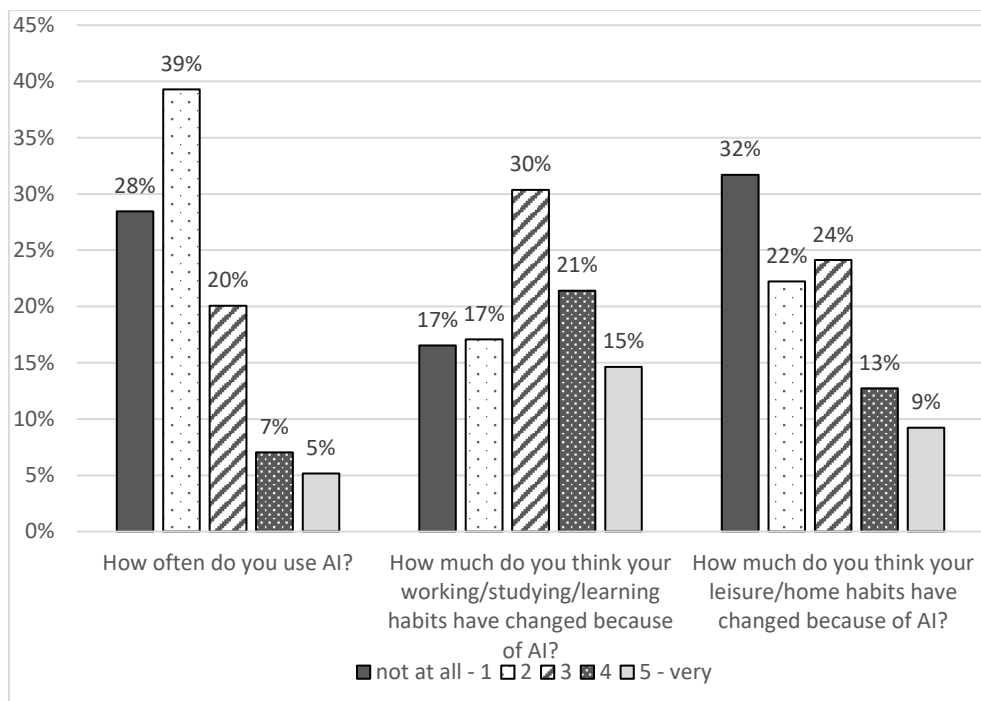


Figure 5: Learners' opinions

Asked how their habits have changed because of AI, 41% of teachers and 76% of students said they had not changed. I asked some students about this in a discussion and they said that they were already using digital content, and for them AI is digital content, so their habits had not changed much.

Some answers given by teachers:

„I often use it for translation when learning a language, intelligent search
It became poorer.

Many people rely entirely on AI for everything. They don't think.

I don't think they've changed significantly, at least not that I've encountered.

AI is in almost every activity, we just don't know about it most of the time. The line between work and leisure is infinitely thinner anyway.

More time spent in front of the phone, computer

Spending more time on the internet

More leisure time spent in the online space.

More people are looking at it instead of thinking about it

A conscious and critical attitude”

Answer given by some students:

„Less book use, less social communication.

Less human contact

Less time spent writing notes and essays, adding more information to what we get at school

Less time spent in front of the computer.

Less motivation to learn, we get everything "ready", less learning

Less thinking, made me more comfortable

Learning is easier.

It is especially for programming problems. The concrete situation can be described to ChatGPT, which returns a ready code. Before AI you had to search forums, it took much more time to solve a coding problem.

We move significantly less in real life, which has a serious negative impact on our mental and physical health.

People have become lazier.
I use it daily to learn languages.
I often search for information that is relevant to me. Faster problem solving. Faster more efficient.
Speed, creativity in the field of ideas
AI has totally taken over simple notebook note taking
It's easier to gather material on different subjects in my education with the help of these at home it's not but my learning habits definitely are, as I always have a helper I can turn to without any obstacles.
Instead of a Google search, I turn to chatGPT/Copilot sooner
People start to isolate themselves from each other
I feel his hobbies are unnecessary, since AI is "better" than me :/
Constant competition”

Do you think artificial intelligence will replace humans 46.6% said no, 35.45% said yes, it will replace to some extent. Of course, there were also longer answers. Some of them are:

„Not entirely but to a large extent in finance, commerce, education, health, there is and will be a place for it.

It will certainly replace it at some level, I'm thinking more of areas where it would be more thought provoking and easier to use AI.

It cannot replace it because it was not designed for that. I find it useful in the field of industrial technology, but I have my doubts in the field of education. The proliferation of humanoid robots as a projected vision of the future does not worry me. Dehumanising ourselves and our fellow human beings is enough for our own moral crisis.

Partial replacement. virtual assistant, chatbot, repetitive computer routine tasks

Probably yes. Computer science, data analysis, assistants, accounting.

Yes. Economy

No, the human will always be needed.

I think it will replace it better in IT, engineering, economics, but where subjectivity plays a bigger role, such as even pedagogy, special education or arts, it will be harder.

In some areas this is already happening. I hear more and more references to the drafting of response letters or other textual documents by AI.

In some areas, yes, which requires automation. But it cannot replace humans in jobs that require creativity and problem solving.”

People have many different ideas on this issue, but the majority of people prefer AI not to replace humans in education.

2.3. ChatGPT's answer

ChatGPT's answer to the question of what AI can be used for in education was. He believes it can be useful in education in these areas:

- personalised learning
- automated assessment and feedback
- monitoring and analysis of the learning process
- virtual teachers and advisors
- content development and testing
- language support and translation
- mental health support
- support for admission and counselling processes.

Summary: AI in education plays primarily a supportive role, helping teachers and students to make the learning process more effective. However, it is unlikely to replace human teachers, as human relationships, empathy and personal support are crucial in education. Rather, AI can be a complementary tool to enable more personalised and experiential education.(ChatGPT, 2024).

ChatGPT's response to the question of whether teachers will become replacable. No substitutions in these areas:

- human contact and empathy
- developing creative thinking and critical thinking skills
- ethical leadership and the transmission of social norms
- flexibility and individual approach
- mentoring and motivation
- working with parents and the community.

Summary: AI may be able to perform some teaching tasks, such as adapting curricula or automatic assessment, but it is unlikely to fully replace human teachers. In education, AI is more of a complementary tool to support the work of teachers and help make teaching more effective and personalised. AI cannot replace the empathic, motivating and inspiring role of human teachers, and they will continue to play a key role in education. (ChatGPT, 2024).

The AI, ChatGPT also agreed that in some areas it is not a substitute for the teacher, but only a supportive role.

3. Summary

The use of artificial intelligence is changing the way people live, work and learn. Lifelong learning is becoming more and more important, with a focus on digital learning, learning and using new and innovative technologies. These provide new forms of assessment that measure learning, in real time, to personalise the learning experience. AI creates opportunities to accompany learners throughout their learning, at school and in the labour market, helping them to achieve higher levels of skills and competences.

AI is an evolving field, its application can complement educational activities, support teachers' work and students' learning methods. Teachers and learners need to pay attention to how they use these tools, as they are neither good nor bad in themselves, but their impact depends on the user.

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