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Unleashing the Potential of AI in Classrooms

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Change is the only constant in life.
Heraclitus

Abstract:
The integration of Artificial Intelligence into classrooms has opened the way for a new era in education, transforming traditional learning environments into dynamic, adaptive spaces. This article tackles the evolution and impact of AI-powered classrooms, highlighting the potential benefits, challenges and ethical considerations associated with the use of AI in education. AI has the potential to become a teacher's co-worker, as long as the teacher filters and reviews AI's products. What is important to understand is that while AI can put together the structure of an educational paradigm, it is the teacher's task to fill in the missing components. AI-powered classrooms represent a transformative shift in education, offering unprecedented opportunities for personalized learning, efficient administrative processes and enhanced content creation.

Keywords: *challenges, opportunities, technology, impact, revolution.*

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Introduction

As teachers, little did we realize in the last few years that Artificial Intelligence would soon become our co-worker. To put in a chronological order, it all started with the invention of the personal computer in the early 1970's with the Kenbak-1, designed and invented by John Blackenbacker of Kenbak Corporation. At that time, the technology of the personal computer was both immersive and addictive and it was there to stay. Then, no longer than two decades ago, we were introduced to two breakthroughs in technology: one was the Internet and the other was the mobile phone. Only few people realized the significant impact of the new technology represented by the internet and the personal computer. Some people simply got a hint of what was just around the corner later on, with the expansion of the internet and technology.

The development of AI – The fourth Industrial Revolution

The last decade was quiet, although we saw some developments in technology, but nothing as impactful as the development of Artificial Intelligence. AI has been around for quite some time, although few of us really paid any serious attention to its presence. Whether we watch TV, go online, use a mobile phone or drive a new-generation car equipped with all kinds of high-tech sensors, AI is present. In addition to this, AI is heavily present in various branches of industry because machines and robots can execute tasks more accurately and for endless periods of time with little or maybe no feedback at all, whereas humans are prone to errors. Not only the industrial domain is the place where AI can be found, but also in our homes: widgets, devices and domestic robots are intended to make our lives easier. Recently thought, AI has snuck into the educational domain, stepping into our schools and classrooms. AI is one of the drivers of the 4.0 Industrial Revolution to facilitate education in teaching and learning (Fitria:2021). The questions that naturally arise are: what will be the impact of such change in the paradigm of education and what consequences should we expect?

AI seems to have come out of the blue recently, although it is the natural consequence of all the little steps taken one by one throughout the time, starting with IBM's Deep Blue, the supercomputer that challenged human intelligence in the famous games of chess against Garry Kasparov in 1996 and 1997. During the last few years, several examples of Artificial Intelligence sprang into being, such as smart assistants, e-payment systems, search algorithms, media streaming, smart phones, smart cars, navigation apps, facial recognition, text editors and social media feeds. However, the creation of the Chat Generative Pre-trained Transformer, or simply Chat GPT, is of the outmost importance in our opinion, as it highlights the most important discoveries and developments in the field of Artificial Intelligence. The first version of Chat GPT was easy to interact with and straightforward to use. With little tips and tricks, one could do magical things with Chat GPT, for example brainstorming, outlining essential aspects of a discourse of even creating artificial images. None of these would have been possible not long ago, at least with the same quality or the same speed. Hartono and alii claim that the adaptive nature of AI tools is valued for its ability to cater to individual needs and offers immediate feedback. (Hartono & alii: 2023)

Understanding AI and Chat GPT Terminology

Before we immerse ourselves in the specifics of Chat GPT and its applications, it is essential that we familiarize with some AI terms:

- *Language Learning Models* (LLM): sophisticated AI systems designed to understand and generate human language, enabling powerful interaction with others;
- *Generative AI*: the ability to create various forms of media such as images, texts, videos and more;
- *Open AI*: the visionary organization behind Chat GPT and other groundbreaking technologies;
- *Prompt Engineering*: the skill of crafting effective prompts or instructions to guide AI models like Chat GPT in producing desired outputs;
- *Prompts*: instructions that are provided to generative AI models like Chat GPT in order to produce specific outputs or responses;
- *Inputs*: the commands or instructions given to generative AI models like Chat GPT to generate outputs;
- *Outputs*: the results generated by generative AI models like Chat GPT in response to the given inputs.

First of all, we must understand that AI is here to stay, so it is up to us to understand how it works and how we can benefit from it. AI has the potential to become a teacher's co-worker, as long as the teacher filters and reviews AI's products. What is important to understand is that while AI can put together the structure of an educational paradigm, it is the teacher's task to fill in the missing components. There are some negative perspectives that may make us want to consider the viability of implementing AI in education, for example Goldman Sachs' projection that up to 300 million jobs will be affected by the latest wave of AI. This type of negative aspects, combined with the speed of development in the domain of AI, which is a speed that we have never encountered before in our entire history, not even in the Industrialized Era, can get a bit overwhelming. Of course, every dark cloud has a silver lining, as AI comes with indisputable advantages. A study conducted by Harvard Business School concluded that workers who used GPT-4 completed on average 12.2% more tasks, were 25.1% quicker and 40% produced higher quality results (Black:2023). The key to a successful interweaving of AI in educational activities lies in the understanding of the way in which AI works and in becoming aware of what it can do and especially of what it cannot do.

AI implementation. Conditions and circumstances

In the recent years, some countries have successfully implemented AI in their curricula from primary to high school. The problem of this type of approach is to have empowered teachers able to implement and execute such AI curriculum. In order to solve this problem, a competency framework has been designed for teachers to implement and execute AI curriculum, such as Curriculum of ICT in Armenia, Data Science and Artificial Intelligence in Austria, Computing and Information Technology in Qatar and Information and Programming in Serbia (for more information, see unesdoc.unesco.org/AI curricula). In the near future, all of us will need to further develop and upgrade our competency framework in order to be able to execute AI-empowered curriculum. This is very important and matters a great deal, as jobs tend to switch from physical to virtual. For example, less than 100 years ago, there were jobs that no longer exist nowadays, due to the fact that circumstances that led to their appearance have changed. There were the so-called water carriers, people who used to carry barrels of water down the street selling it to thirsty people, or lamp-lighters, people who would walk in the street at dusk carrying long sticks which they used to ignite

lamps on poles or lift operators. These jobs have disappeared along the way as technology has replaced them with a tap or a simple switch that performs the same task faster, more accurately and definitely much cheaper than a human operator. The point is that jobs, more exactly their particularities and goals, change as time passes and technology evolves. Less than 10 years ago, jobs such as block chain analyst, driverless car engineer, telemedicine physician, cloud architect, drone operator or e-sport game coach were very rare or did not exist at all. It was beyond one's imagination back then that people would actually make money from creating virtual content on social platforms such as Tik Tok or YouTube. The unimaginable is happening now. What is more, as circumstances change, new jobs will appear, dictated by new needs and these will result in new professions, such as space tourism guide, climate change reversal specialist, drone manager, virtual identity defender, data detective, AI Business Manager or even Space Junk Recycler. As new as they are, these jobs will require new knowledge, new skills and competencies and teachers will have to acquire new tools in order to teach and help develop the necessary skills for specialists to perform the tasks implied by these new jobs. What this means is that the concept of teaching will undergo some fundamental changes as well. As Bărbuceanu states, "Subsequent of the growth of ground-breaking didactic technologies, the common apprehension of teaching and didactics progresses together with the expansion of learning theories" (Bărbuceanu:2020). This is equally valid for the development of technology. Some may claim that human teachers will be replaced somewhere along the way by virtual teachers guided by Artificial Intelligence, which is something that may pose a series of problems we have never encountered before, such as how objective can AI be in assessing semi-objective evaluation items or how appropriate is AI in terms of dealing with aspects related to students' emotional intelligence. Is online presence enough for a high-quality teaching session or should teachers just customize their lesson planning and teaching techniques according to future AI existence-related circumstances?

AI competency as a key skill for teachers

AI-powered tools in education are seen as potentially beneficial to both students and teachers since they offer the opportunity to experience personalized, flexible, inclusive and engaging learning. (Delgado:2020). Teachers' activity in the virtual environment will not be limited only to using virtual platforms such as Zoom, EdX or Coursera. Their activity will become more intricate and it depends on us to start preparing for the change that is just around the corner, as the speed at which the progress in the technological domain is unfolding is simply remarkable. What does preparation imply more exactly? Well, we can just assume what the teachers of the future will need to be and what they definitely won't need to be. First of all, there is no need to replace human teachers with robots, for a multitude of reasons, among which ethical reasons are obviously the most important. But the teachers of the future will definitely need to be AI literate and will have to be able to perform several tasks. To me more precise, the fundamental role of teachers will be different. Teachers will move from the paradigm of the person who delivers knowledge to the paradigm of the person who will facilitate and accelerate learning using Artificial Intelligence. In practical terms, this means on the one hand that teachers will have to assist students to use Artificial Intelligence in ethical ways in order to solve problems, do homework, prepare for lessons and then how to engage in more intricate problem-solving using their own minds. On the other hand,

teachers will have to be AI competent, meaning they will need to operate or use different language models, different AI tools or even AI prompting techniques. To such purpose, teachers will have to learn how to use AI for the benefit of students, granting roles to AI as Admin Co-Pilot, Lesson Planner, Auto-Grading, Test Prep Co-Pilot or even Gap Analyst. For instance, using AI as Admin Co-Pilot offers the opportunity to use Voice-2-Text applications, meaning that the teacher only has to activate the function that turns speech into text. Also, applications such as Chat to Any *PDF* allow teachers to upload files into the computer and then, instead of spending time to read tens or even hundreds of pages, simply ask questions such as "What is the topic of this paper?" or "Identify the main events of the story in this document." If, for instance, the teacher uploads a series of documents, AI can identify quite rapidly similitudes and the degree of originality, saving time and energy for teachers and allowing them to get involved in other educational activities. Other online tools, such as Perplexity AI, can prove valuable instruments for teachers' portfolios, as this specific application can help teachers prepare lessons. It gives instant results powered by latest .3 or .4 versions of Chat GPT and links the results to the resources available on the Internet. Other AI-powered applications, such as Bing Chat, use large advanced language and are connected to the internet, making it possible to access any necessary information. Of course, there are search engines, such as Google, that can offer answers to a variety of questions, but instead of searching repeatedly through suggested search results indicated by Google, Bing Chat offers easy-to-understand responses with links in the footnotes to follow in case of need for further clarifications. Bing Chat has a lot of other interesting features: it can be used to find answers to questions related to class or teaching materials, to carry out research for a paper, to find answers for take-home exams or assignments, to make graphs or charts or simply to explain intricate concepts or topics in a proactive, stress-free way. Students may also use Quizlet by building a study set with terms and definitions and then using different learning methods in order to comprehend the notional content. For students who are keen on learning another language, Duolinguo is a great application which can be used as a supplement to courses they take in school and represents a good way to bridge the understanding gap that sometimes is created in class. Duolinguo focuses on vocabulary, grammar, reading, writing, listening and speaking and features gamified language learning with bite-sized lessons, suitable for various proficiency levels. Memrise is another application which focuses on vocabulary and pronunciation and uses mnemonic techniques and multimedia to help students remember words and phrases. Grammarly focuses on grammar and writing and helps students improve their writing by providing grammar and style. Rosetta Stone is another application which focuses on all language skills and offers immersive language learning with a focus on natural language acquisition. Last but not least, there is Google Translate, which is useful for translating texts, practicing pronunciation and learning new words. If parents are somehow worried about the access to various information available on the internet that teenagers can gain just by using AI chatbots, then Socratic is a good alternative, as it allows students to ask questions about their topics of interest and school subjects, to upload their work sheets and to participate in human-like conversations, with responses related to YouTube links, blocking at the same time, to parents' relief, inappropriate questions.

Artificial Intelligence can be an invaluable support for teachers in the process of planning lessons. Open AI launched a new feature in Chat GPT called Vision to Text. This special feature allows teachers to input an image in the program, while Chat GPT

will describe the image layer by layer starting from the background, then moving to the middle ground and ending with the foreground. This feature of describing images in detail can be used by prompting a question to AI such as how that image can make the lesson more engaging for the students. AI will then offer some suggestions that will stir the teacher's creativity and act as a supporting scaffolding for the structure of the lesson. Moreover, AI can be asked questions such as what related tasks the students can perform in order to prepare for the class or what is the best method to deliver information for those students who might find the topic of the lesson too complex. The same approach works for other applications, such as Bart, which basically performs the same tasks as Chat GPT, with the advantage of not having to pay a monthly subscription. Beautiful AI helps turning thoughts and ideas to images, allowing students to create word clouds and quotes. Bing Image Creator is somehow similar to Bart and Chat GPT, in that it creates images starting from requests typed in by the user. PlaygroundAI performs the same tasks, that is creating images, once you have typed in specific instructions. One can simply type in "Atilla the Hun riding a Harley Davidson motorbike, wearing traditional clothes and black Ray-Ban sunglasses" or "Elvis Presley planting roses in the garden", and you can get these amazing images:

Another benefit of using Artificial Intelligence in education is that it can be used in the process of assessment and evaluation. Of course, although assessment and evaluation imply a certain degree of subjectivity, the human factor should perform these tasks still. However, AI can help the teacher in assessing and evaluating students by offering feedback on files containing students' answers, analyzing the weak points and their strong points, thus playing the role of Grading Co-Pilot. Aside from giving feedback, AI can make recommendations on how students can improve their skills and performance, which can be a very useful tool in teachers' work.

Empowering AI in English Language Teaching

Integrating AI into teaching English can enhance the learning experience for students by providing personalized, adaptive and interactive tools. Using AI in education is not necessarily about tools, but about building competencies and life skills, including abilities regarding data mining, digital literacy, media literacy or asking purposeful questions. Using AI in education is also about fostering engagement, collaboration and creativity. Here are some ways teachers can leverage AI in teaching English:

- AI-Powered Language Learning Apps

Language learning apps are programs that use AI algorithms to adapt to each student's proficiency level and learning style. These apps often provide personalized lessons, quizzes and feedback.

- Automated Assessment and Feedback

AI-driven tools are implemented for automated grading and feedback on written assignments. This can save teachers' time and provide students with immediate insights into their language skills.

- Speech Recognition Technology

Speech recognition technology is integrated in order to help students improve their pronunciation and speaking skills. AI-driven systems can provide real-time feedback on pronunciation accuracy and fluency.

- Chatbots for Conversational Practice

AI-powered chatbots are used to facilitate conversational practice. Chatbots can engage students in dialogues, answer questions and provide language exercises in a conversational format.

- Adaptive Learning Platforms

Adaptive learning platforms that use AI are implemented to adjust the difficulty and content of lessons based on individual student performance. This ensures that each student receives content that is tailored to their specific needs.

- Language Translation Tools

AI-driven language translation tools are used for exploring and understanding English texts. These tools can help students translate unfamiliar words, phrases or sentences, whilst promoting comprehension.

- Virtual Reality (VR) and Augmented Reality (AR)

VR and AR applications help create immersive language learning experiences. These technologies can simulate real-world scenarios, making language learning more engaging and contextual.

- Grammar and Writing Assistants

AI-driven grammar and writing assistants can help students improve their writing skills. These tools can provide suggestions for grammar, style and vocabulary enhancements.

- Interactive Language Games

AI can be incorporated into interactive language games that make learning English enjoyable and engaging. These games can reinforce vocabulary, grammar and language skills in a playful manner.

- Data Analytics for Progress Tracking

AI-driven data analytics tools are used to track student progress and identify areas where additional support may be needed. This data can inform instructional strategies and interventions.

- Personalized Learning Plans:

Personalized learning plans can be developed and customized for students using AI algorithms. These plans can be based on initial assessments and continuously adjusted as students improve skills and gain more knowledge, ensuring a tailored learning experience.

Potential results of using AI in classroom

Klaus Schwab, Founder and Executive Chairman of the World Economic Forum, stated that "In the 21st century, the capacity to continuously learn and apply/integrate new knowledge will be the key competency. Every child should be inspired and empowered to be a life-long learner" (see unicef.org/media). Starting from this quote, we can go even further and predict that in the AI era, a growth set will represent our wings towards the future and lifelong learning will be our power.

Combined, these two concepts will help us keep the pace with the machines and use their potential to help us evolve as human beings. Intelligence and abilities can thus develop overtime with hard work and effort, as using AI in classrooms can result in higher motivation and better performance. Students will learn how to tackle challenges, how to become resilient and persistent when facing a setback and how to view failure as a learning experience rather than simply a failure. More than that, students will be able to learn from their mistakes and develop critical thinking, reasoning, problem solving thinking and analytical thinking. More important than anything, students will have to be able to discern, to gather information, verify and put it in various contexts and to handle generated knowledge. However, Alhalangy and Abdalgane point out that in order to have a positive impact on the field of English language teaching and learning, AI needs to be better integrated into educational settings. (Alhalangy and Abdalgane:2023)

All things considered…

As technology continues to evolve, the collaboration between teachers, policymakers and technologists will be crucial in shaping the future of AI in classrooms. AI-powered classrooms represent a transformative shift in education, offering unprecedented opportunities for personalized learning, efficient administrative processes and enhanced content creation. While the benefits are substantial, careful consideration of ethical implications, privacy concerns and equitable access is essential in order to ensure that the implementation of AI in education serves the best interests of students and teachers alike.

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