Applications, Tools and Perspectives of AI in Education for Secondary School Teachers

HELLENIC MINISTRY OF Education, Religious Affairs and Sports

CTI DIOPHANTUS

Co-funded by the Erasmus+ Programme of the European Union

eTwinning National Support Organisation

AI in eTwinning Projects

Patras, *10-12 May 2024*

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Contact Seminar

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What is AI?

Artificial Intelligence, or AI, refers to the ability of machines to perform tasks that typically require human intelligence.
This includes tasks such as

- understanding natural languages, (Chatbots and Virtual Assistants, Language Translation, Sentiment Analysis, Text Summarization, Question Answering Systems. etc
- recognizing patterns, (Image Recognition, Speech Recognition, Financial Fraud Detection, Predictive Maintenance, Market Analysis. etc) and
- making decisions based on data (Recommendation Systems, Autonomous Vehicles, Credit Scoring, Healthcare Diagnosis, Supply Chain Optimization, etc)

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Why has the AI debate opened up lately? Is there really any significant scientific progress?

- The topic was opened around 2016
- Tremendous revolution happened in the AI industry.
- After 2016, algorithms were developed that could translate texts from one language to another – such as Google Translate – or recognize images, etc.
- Highly complex algorithms were developed thanks to the existence of very powerful machines, infinite data from social networks, sensors, applications, etc.
- "Attention Is All You Need" is a landmark (2017) research paper authored by eight scientists working at Google (introduced a smarter way for computers to understand and translate languages by focusing on important parts of text as they go, leading to better translations and language understanding)

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AI vs HI

- Common sense reasoning
- Creativity and innovation
- Emotional intelligence
- Adaptability and flexibility
- Self-awareness and consciousness

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Pros and Cons

Pros

Efficiency: AI can automate repetitive tasks, leading to increased efficiency and productivity in various industries.

Accuracy: AI algorithms can analyze large datasets and make predictions or decisions with a high degree of accuracy, outperforming humans in certain tasks.

Personalization: AI enables personalized experiences in areas such as **education**, healthcare, and marketing, tailoring services and recommendations to individual preferences and needs.

Innovation: AI fosters innovation by enabling the development of new products, services, and applications that were previously not possible.

Safety: In fields like transportation and healthcare, AI-powered systems can enhance safety by detecting potential risks and making real-time decisions to mitigate them.

Cons

Job Displacement: AI automation may lead to job displacement in certain industries, as machines and algorithms replace human workers in repetitive or routine tasks.

Bias and Fairness: AI algorithms can inherit biases from the data they are trained on, leading to unfair or discriminatory outcomes.

Privacy Concerns: AI systems often rely on large amounts of data, raising concerns about privacy and data security, especially when personal or sensitive information is involved.

Ethical Dilemmas: ethical questions, such as how to ensure accountability and transparency in AI decision-making, and how to address issues of fairness and social impact.

Dependence and Vulnerability: Society's increasing reliance on AI technologies raises concerns about dependence and vulnerability, particularly if AI systems malfunction or are manipulated by malicious actors.

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Let's Recall what eTwinning is about

The eTwinning action was launched in January 2005.

Its main objectives complied with the decision by the Barcelona European Council in March 2002 in order to

- Promote School collaboration in Europe through the use of Information and Communication Technologies (ICT), Encouraging Digital Literacy by providing support, tools and services for schools
- Promote Awareness of the multicultural European model of society
- Enhance Professional Development
- Foster Innovation in Education
- Support Inclusion and Diversity

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What are the evaluation criteria taken into account?

- **Pedagogical innovation:** how aspects of the projects can be considered more innovative and creative regarding content and objectives, the approach, activities and methodology, final products, dissemination and publication.
- **Curricular integration:** how the project was integrated into the curriculum.
- **Collaboration between partner schools:** how each member of the project contributed to its development by working together with the other members.
- **Use of technology:** how the project made use of ICT tools creatively.
- **Results, impact and documentation:** what outcomes and benefits resulted from the project's activities and how they were disseminated beyond the members.
- Overall quality of the project, its replicability, the level of collaboration among partners from different countries, etc

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Pedagogical innovation

AI tools have the potential to enhance pedagogical innovation in eTwinning projects by

- providing personalized learning experiences,
- generating actionable insights from data,
- facilitating collaborative learning,
- supporting content creation and curation, and
- promoting multilingual communication and cross-cultural exchange.

By leveraging AI technologies effectively, teachers can enhance the quality and impact of eTwinning projects and provide engaging and meaningful learning experiences for their students

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Collaboration between partner schools

AI can play a significant role in enhancing collaboration between partner schools in eTwinning projects by providing tools and technologies that facilitate communication, coordination, and knowledge sharing.

- Language Translation
- Collaborative Document Editing
- Content Recommendation
- Virtual Collaboration Spaces
- Project Management Tools
- Virtual Collaboration Assistants

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Results, impact and documentation

There are several AI-powered tools and technologies that can support these activities:

- Data Analytics Platforms
- Natural Language Processing (NLP) Tools
- Learning Analytics Tools
- Document Automation Platforms
- Survey and Assessment Tools

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Where and How?

Everywhere

AI Tools Search Site: https://theresanaiforthat.com/

And

https://medium.com/@maximilian.vogel/5000x-generative-ai-intro-overview-models-prompts-technology-tools-comparisons-the-best-a4af95874e94

There are several courses on Coursera and EDX that cater to professional development for teachers looking to integrate AI into their educational practices:

- **Artificial Intelligence (AI) Education for Teachers** offered by Macquarie University - This course is designed to equip teachers with foundational knowledge in AI, focusing on computational thinking, critical thinking, and practical applications of AI in educational settings
- **Generative AI in Education** offered by the University of Glasgow - This course dives into generative AI technologies, discussing their potential uses in education, including lesson planning and content generation, while also addressing ethical considerations
- **Innovative Teaching with ChatGPT** offered by Vanderbilt University - This course provides practical techniques for educators at all levels to integrate ChatGPT and other generative AI tools into their teaching, enhancing both student learning and classroom engagement

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Tools 1

Graphy- visualize and share your data (https://graphy.app)

Llava - AI to help you evaluate images, like school exercises or even YouTube thumbnails (https://llava.hliu.cc/)

Ideogram - Generate images with text that is spelt correctly (https://ideogram.ai/)

Pixelcut - Enhance, upscale and edit your existing photographs and images (https://www.pixelcut.ai/)

Suno AI - Create songs and music out of prompts (https://suno.ai/)

Scispace - Conduct literature review or summarize complex research papers in seconds (https://bit.ly/SciSpace-telumetar)

Math Solver- Get step-by-step solutions to your math problems (https://math.microsoft.com/en)

Fotor- Free online software for image extraction from linguistic description (https://goart.fotor.com/)

Lunapic - Free online software for general online photo editing (https://www7.lunapic.com/editor/)

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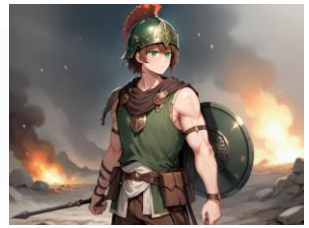
Tools 2

DeepDreamer - Online software for extracting image and video from linguistic description (https://deepdreamgenerator.com)

Comic AI- AI-based comic creation software (https://comicai.ai/)

- Creating a school frame comic
- Create an educational comic
- Comic creation to create an educational comic through artificial intelligence including advantages - disadvantages arising from the use of AI techniques



OR https://www.comicsmaker.ai/

Synthesia- AI-based video production platform (https://www.synthesia.io)

Elai- Create AI-based tutorial training videos with a presenter (https://elai.io/)

Clipchamp - AI-based video multipurpose software (https://clipchamp.com/en/)

Includes, Automatic subtitles, Text to sound, Dimensional change, Speech trainer, Automatic AI editing

Kickresume- General AI-based career toolbox. **Verify your teacher status and get six months of Kickresume Premium for free, need an ITIC**, (https://www.kickresume.com/en/)

DeepL- Automatic translation generation and paraphrasing beta version (https://www.deepl.com/translator)

Fliki AI- Produce videos with AI, Use prompts with few keywords to create videos, Convert Powerpoint to video, (https://fliki.ai/)

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Character AI: https://beta.character.ai/

It's a chatbot service in much the same sense that ChatGPT is. The difference of the service lies, to a large extent, in the fact that users are given the possibility to create "characters" with corresponding "personalities" (which simulate specific persons, or completely new ones, or having specific purposes and goals, etc.), characters that can then be made available to the rest of the user community to chat with.

1. Creating characters with specific personalities, through descriptions from the character's point of view:
   - Simulation of specific characters
   - Creation of historical figures
   - Creating a character of different purposes:
     - Assistant
     - Cartoon or game characters
     - Comedians
     - Hysterics, philosophers, researchers in various fields
2. Create a game (with language interaction)
   - Fantastic rules and framework made by the respective character
3. Create a book
4. Create a teacher:
   - E.g. philology instructor

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Example

Step-by-step video creation of a historical figure speaking (e.g. about its work) – to introduce tools from the widest range of applications: image, text, speech, music, video

1. Using AI to extract an image of the historical face (https://lexica.art/?q=leonardo+da+vinci)
2. Using ChatGPT to generate the script (https://chatgpt.com)
3. Using Elevan labs to produce the speech (https://elevenlabs.io/app/speech-synthesis)
4. Use Studio D-ID to produce visuals that seem to speak (https://studio.d-id.com/share?id=4d7400f335c191f71703c66b2c940463&utm_source=copy)
5. Use Suno ai to create background song

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Questions

Can we teach with machines Or should we deny?

Artificial Intelligence A new frontier Can it enrich education?

Questions about Pedagogical issues

Questions about Ethical issues

Questions about Accessibility Issues

Questions about Educators' Professional Development Issues

Questions for Assessment Topics

Questions about Future Effects

Collaborative Issues Questions and Research Conclusions

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Questions 2

Questions about Pedagogical issues

- How can artificial intelligence improve teaching and learning experiences in primary and secondary education?
- What are the possible benefits and disadvantages of integrating artificial intelligence into the everyday teaching process?
- How AI can adapt to different learning styles and individual student needs?
- How are AI technologies currently being applied in educational settings?
- What Challenges and Risks Does AI Pose in Education?

Questions about Ethical issues

- What ethical factors should be considered when implementing artificial intelligence in the educational context?
- How can bias and fairness be addressed in AI-powered educational tools and systems?
- What are the implications of using AI for the privacy and security of student data?
- What are the ethical considerations of using AI in schools (e.g., privacy concerns, data security)?
- How can schools address the potential for bias in AI-driven tools?
- What are the limitations of AI in understanding complex human behaviors and interactions?

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Literature Review

What are the key advantages of incorporating AI chatbots in education from the viewpoint of students?

The integration of chatbots and virtual assistants into educational settings has the potential to **transform support services, improve accessibility, and contribute to more efficient and effective learning environments** (Chen et al., 2023; Essel et al., 2022).

AI tools have the potential **to improve student success and engagement**, particularly among those from disadvantaged backgrounds (Sullivan et al., 2023)

Students acknowledge that ChatGPT's answers **are not always accurate** and emphasize the need for solid background knowledge to utilize it effectively, recognizing that it cannot replace human intelligence (Shoufan, 2023).

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Literature Review

What are the key advantages of integrating AI chatbots in education from the viewpoint of educators?

- **Time-Saving Assistance**. However, The expertise, experience, and comprehension of the teacher are essential in making pedagogical choices, as AI is not capable of replacing the role of a teacher (Cooper, 2023)
- **Improved pedagogy**. (Herft, 2023)
- **Adapts educational content** to cater to the distinct needs, interests, and learning preferences of each student, offering personalized learning materials and activities (Al Ka'bi, 2023; Fariani et al., 2023)

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Literature Review

What are the main concerns raised by researchers/scholars regarding the integration of AI chatbots in education?

- **Homework and Study Assistance**. AI-powered chatbots can provide detailed feedback on student assignments, highlighting areas of improvement and offering suggestions for further learning (Celik et al., 2022).
- Offer Flexible personalized learning (Fariani et al., 2023; Kikalishvili, 2023; Schiff, 2021;Kasneci et al. 2023)
- **Skills development**. It can aid in the enhancement of writing skills (by offering suggestions for syntactic and grammatical corrections) (Kaharuddin, 2021), foster problemsolving abilities (by providing step-by-step solutions) (Benvenuti et al., 2023), and facilitate group discussions and debates (by furnishing discussion structures and providing real-time feedback) (Ruthotto et al., 2020; Wang et al., 2020
- **Reliability and Accuracy**. AI chatbots may provide biased responses or non-accurate information (Kasneci et al., 2023; Sedaghat, 2023)
- ChatGTP should not be regarded as a reliable information source (Sevgi et al., 2023)
- Within the field of medical education, it is crucial to guarantee the reliability and accuracy of the information chatbots provide (Khan et al., 2023)
- Concerns about academic integrity and fair assessment practices (AlAfnan et al., 2023; Kung et al., 2023)
- The integration of AI chatbots in education **raises several ethical implications**, particularly concerning data privacy, security, and responsible AI use, (Masters, 2023; Miao & Ahn, 2023; Sedaghat, 2023; Thurzo et al., 2023)

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Quiz: AI in Education

https://quizizz.com

- 10 questions
- 30 sec each
- Not a competition
- Take your time

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Thank you for your attention

May the AI-Force be with You

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