



Artificial Intelligence and its Educational Implications

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Glossary of terms

Activation function: A mathematical function that determines whether a neuron will be "activated" (e.g., ReLU, Sigmoid).

AI ethics: The study of ethical issues in the development and use of AI.

Algorithm: Set of rules/steps to solve a problem (e.g., sort data).

Artificial Intelligence-AI: The ability of a system to mimic human intelligence (analysis, learning, decision making).

Backpropagation: Algorithm for training neural networks, with weight optimization through error calculation.

Bias (Bias): Systematic deviation in results due to predispositions to data or algorithms.

Big Data: Huge amounts of data (structured/unstructured) that require specialized analysis.

Computer Vision: AI field that analyzes and interprets visual data (images, videos).

Convolutional Neural Network (CNN): A special neural network for image processing (e.g., object recognition).

Dataset: Collection of data for training or modeling.

Deepfake: AI technique to create realistic fake videos/images.

Deep Learning: Machine learning technique that uses deep neural networks.

Explainability: The ability to explain how an AI model made a decision.

Generative Adversarial Network-GAN: Network that creates new data (e.g., images) through a competition of two sub models.

Generative AI: Technologies that create new content (text, images, music).

Gradient Descent: Error minimization method by adjusting network weights.

Large Language Model (LLM): Large Language Models trained in huge datasets (e.g., GPT-4, Bard).

Machine Learning-ML: A subset of AI where systems automatically learn from data without explicit programming.

Natural Language Processing-NLP: A field of AI that deals with the understanding and production of human language (e.g., chatbots).

Neural Network: Computational model inspired by the human brain, with connected artificial neurons.

Overfitting: When a model "memorizes" training data and fails new data.

Recurrent Neural Network (RNN): Neural network for processing sequential data (e.g., text, time series).

Reinforcement Learning: The model learns through activities and rewards (e.g., robots that learn to walk).

Robotics: Design robots that combine AI and engineering for autonomous operation.

Singularity: Hypothetical scenario where AI surpasses human intelligence.

Supervised Learning: The model learns from highlighted data (e.g., images labeled "cat" or "dogs").

Tokenization: Process of separating text into small units (tokens).

Transformer: Architecture based on attention mechanisms (e.g., GPT, BERT).

Underfitting: When the model is too simple and does not understand the basic patterns.

Unsupervised Learning: The model discovers patterns in unmarked data (e.g., customer grouping).



Clarification of terms

Machine Learning

Machine Learning (ML) is a subset of AI that focuses on developing algorithms and systems that learn from data, without being explicitly programmed for specific tasks. ML systems recognize patterns in data and make predictions or decisions based on them. ML automates complex tasks, improves prediction accuracy, and breaks new ground in science, technology, and industry. ML is the hidden engine behind many modern technologies.

How it works

- Data: ML systems feed on data (e.g., numbers, images, text). Example: Photos of cats and dogs to learn to distinguish them.
- Training: The model analyzes data and learns to link traits to results. Example: If a picture has "noses and whiskers," the model learns that it belongs to a cat.
- Prediction: When new data is provided, the model classifies it or predicts outcomes. Example: Automatically splits new photos into "cats" or "dogs."

Basic types of machine learning

- Supervised Learning. Definition: The model learns from tagged data (known results). Examples: Classification: Splitting emails into "spam" or "not spam." Regression: Predict house price based on size and location.
- Unsupervised Learning. Definition: The model discovers abstract patterns in unlabeled data. Examples: Clustering: Grouping customers based on their purchases. Dimensionality reduction: Simplification of complex data.
- Reinforcement Learning. Definition: The model learns through testing and receiving rewards for correct actions. Examples: Robots learning to walk. AI that plays video games (e.g., AlphaGo).

Common ML algorithms

- Linear Regression: Prediction of continuous values (e.g., temperature).
- Decision Trees: Sort by yes/no questions.
- Neural Networks: A model inspired by the brain.

Applications

- Medicine: Diagnosis of diseases by X-rays.
- Economy: Credit card fraud detection.
- Technology: Voice assistants (e.g., Siri, Alexa).
- Marketing: Personalized offers to customers.

Challenges

- Bias: If the data is unrepresentative, the results will be incorrect.
- Overfitting: The model "memorizes" training data and fails new data.
- Data quality: "Garbage In, Garbage Out".

Example in practice

- Problem: Forecast chance of rain tomorrow.
- Data: Historical meteorological measurements (temperature, humidity, pressure).
- Algorithm: Decision Trees or Neural Networks.
- Exit: "80% chance of rain".



Ask the AI of your preference to learn more

- What is the difference between supervised, unsupervised and reinforcement learning?
- How is deep learning different from traditional machine learning?
- What are the key steps in a machine learning project?

- What are the most common applications of machine learning in the industry [specific area you are interested in]?
- How is machine learning used in natural language processing?
- What are the applications of computer vision?
- How can a small business benefit from ML technologies?
- What are the most popular frameworks and libraries for machine learning?
- Which programming languages are best for ML and why?
- What are overfitting and underfitting and how can we avoid them?
- How do algorithms like random forests, SVM, or gradient boosting work?
- How do I get started with machine learning as a beginner?
- What online courses or certifications are worth for ML training?
- What are the main issues with bias in ML algorithms?
- How can we ensure fair and ethical use of ML models?
- What are the biggest challenges in developing reliable ML systems?
- How do we deal with the interpretability of black box models?
- What are the most exciting developments in ML in recent years?
- How does machine learning relate to other areas of AI?
- Which emerging ML technologies have the greatest potential?
- What is AutoML and how does it change the field?



Activity 1. Group work. Look for a case study that involves the development or use of a Machine Learning system (e.g., analyzing health data for disease diagnosis, applying ML to credit card fraud detection, facial recognition). Then create a very short PowerPoint presentation with a maximum of 5 slides, showing what type of machine learning the app used (supervised, unsupervised, or reinforcement learning), What data it used, what results it had and what are the advantages and limitations of implementation. Evaluation criteria: originality of presentation, use of documented sources, critical and synthetic way of development and clarity of positions.



Activity 2. Group work (elective graded assignment). Create an infographic (with whichever application you want) that presents the differences, similarities and applications of the basic types of Machine Learning (supervised, unsupervised and reinforced). The infographic should include: clear definitions, real examples from technological applications of each type and presentation analysis of advantages and disadvantages. Evaluation criteria: the originality and aesthetic integrity of the infographic, the critical and synthetic way of development and the clarity of positions.



Activity 3. Group work. With the help of the AI of your choice, write an essay of a maximum of 500 words, explaining why ML is considered the "hidden engine" behind modern technologies, citing three examples from different sectors (e.g. health, economy, advertising). Then check the text for the accuracy of the information generated by AI. In a Word document list the prompt you provided, the text generated by the AI, as well as the corrections you made. Evaluation criteria: the accuracy of the prompt, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.

Deep Learning

Deep Learning is a subset of machine learning that uses multilayer neural networks ("deep" networks) to model and process complex data. It's the technology behind apps like face recognition, automatic translations and autonomous vehicles. Deep learning has redefined AI with applications that seemed science fiction 20 years ago. It is the main reason for the explosion of AI in the last decade. It is the core of modern AI. With the power of neural networks, it can solve problems that were considered impossible, radically changing our way of living and working

How it works

- Neural Networks: Structures inspired by the human brain, with connected artificial neurons (nodes).
- Layers: Input layer: Accepts data (e.g., image pixels). Hidden Layers: Process data step by step, extracting attributes. Output Layer: Produces the final result (e.g., "This picture shows a cat").
- Automatic attribute extraction: The first layers detect simple features (edges, colors). The deeper layers recognize complex forms (eyes, faces).

Basic architectures

- CNN (Convolutional Neural Networks). Image/video recognition. Uses filters to detect geometric patterns (e.g., lines, textures). For example, the system that recognizes cats in photos.
- RNN (Recurrent Neural Networks). Edit sequences (text, time series). It has "memory" for previous data (e.g., the word "is" in a sentence depends on the verb). For example, translating text from English to Greek.
- Transformers. Natural language processing (NLP). It uses attention mechanisms to give weight to important words. For example, ChatGPT which produces coherent text.

Advantages and challenges

- Automatic feature extraction (no need for manual preprocessing).
- High accuracy in complex problems (e.g., speech recognition).
- It requires huge data.
- High computational costs (GPUs required).
- Difficult interpretation of results ("black box").

Applications

- Computer Vision. Object recognition, autonomous vehicles, medical imaging.
- Natural Language (NLP). Chatbots, translation, text writing.
- Generative AI. Create images (DALL-E), music, videos.



Ask the AI of your preference to learn more

- What is the difference between traditional machine learning and deep learning?
- How does hierarchical feature learning work in deep learning?
- What role do GPUs play in the development of deep learning?
- What are the main deep learning architectures and how do they differ?
- How do LSTM and GRU networks work and why are they important for sequential data?
- What is the Transformer architecture and how has NLP changed?
- How do Generative Adversarial Networks (GANs) work?
- What are the challenges in deep neural network training?
- What is the problem of vanishing/exploding gradient?
- How do normalization techniques like Batch Normalization help?
- What are the modern optimization algorithms for deep learning?
- What is the learning rate scheduling technique?
- How does dropout work and why is it effective?
- What is L1 and L2 normalization and when is each used?

- How does data augmentation help education?
- What is early stopping and how does it prevent overfitting?
- What is transfer learning and how can I implement it?
- How does fine-tuning work in pre-trained models?
- How do I handle limited training data in deep learning?
- What are attention mechanisms and how do they improve models?
- How does self-supervised learning work in deep learning?
- What is contrastive learning and how is it used?
- How do diffusion models work for image production?
- What is the technique of knowledge distillation?
- Which deep learning frameworks are the most popular and what are their differences?
- How can I optimize a deep learning model for a productive environment?
- How are memory requirements addressed in large deep learning models?
- What are the strategies for distributed training?
- How can I quantify uncertainty in deep learning models?
- How does prompt engineering work?
- What are the challenges in developing larger language models?
- What is RLHF (Reinforcement Learning from Human Feedback)?
- How can we understand what a deep neural network "learns"?
- What techniques are there for explainable deep learning?
- How can we assess the reliability of deep learning models?
- What are adversarial attacks and how can we protect ourselves?
- What are the promising approaches for energy efficient models?
- How is deep learning moving towards multimodal models?
- What ethical challenges are created by powerful deep learning models?
- How can we ensure fair and non-discriminatory models?
- What are the social implications of widespread adoption of deep learning?



Activity 4. Group work. With the help of the AI of your choice, write an essay of a maximum of 500 words that answers the question "How has deep learning changed AI and our way of life?". Then check the text for the accuracy of the information generated by AI. In a Word document, list the prompt you provided, the text generated by AI, and the corrections you made. Evaluation criteria: the accuracy of the prompt, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.



Activity 5. Group work (elective graded assignment). Design a digital poster that explains how CNNs and RNNs work, providing examples of applications. Evaluation criteria: the originality of the poster, the use of documented sources, the critical and synthetic way of development and the clarity of positions.

Neural Networks

They are systems of artificial neurons (nodes) that are connected to each other and process information in a way similar to brain tissue. The goal is to learn from data and make predictions or classifications without explicitly planning. Neural networks are the treasure trove of modern AI, capable of solving problems that were impossible a few years ago. With the evolution of Deep Learning (networks with many layers), new horizons are opening up in technology, science and everyday life. Each neuron receives data, multiplies it by weights, adds a bias, and applies an activation function (e.g., ReLU, Sigmoid).

Structure

- Input Layer: Accepts data (e.g., image pixels, words).
- Hidden layers: They process data through mathematical operations.
- Output Layer: Produces the final result (e.g., sort image to "cat" or "dog").

Training

- Backpropagation algorithm: Calculates output error and adjusts weights to minimize it.
- Optimization: Uses methods like Gradient Descent to find optimal weights.

Basic types of Neural Networks

- Feedforward Neural Networks (FNN). Data flows only forward (from input to output). They are used for simple classifications (e.g., digit recognition).
- Convolutional Neural Networks (CNN). Especially for images. They use filters to detect features (e.g., lines, colors). They are used for facial recognition, autonomous vehicles.
- Recurrent Neural Networks (RNN). They process sequential data (e.g., text, time series). They are used for translation, stock market forecasting.
- Transformer Networks. They rely on attention mechanisms to process long sequences. Examples: GPT, BERT.

Applications

- Image/sound recognition (Facebook tag, voice recognition, Siri).
- Natural language (NLP): Translation, chatbots.
- Robotics: Robot movement in dynamic environments.
- Medicine: Diagnosis of diseases by X-rays.

Advantages and challenges

- They learn from complex data.
- Excellent in nonlinear problems.
- They require huge data and computing power.
- Sensitive to "violent data" (adversarial attacks).

Example: How does a CNN recognize a cat?

- Input: Image pixel.
- Hidden Layers: Detects simple features (edges, colors). It combines features in complex forms (eyes, beard).
- Exit: Probability that the image is a cat (e.g., 98%).



Ask the AI of your preference to learn more

- What is a neural network and how is it inspired by the human brain?
- What is the difference between an artificial neuron and a biological neuron?
- How do trigger functions work and which are the most common?
- What are weights and biases in a neural network?
- What are feed-forward neural networks and how do they work?

- How do convolutional neural networks (CNNs) differ from traditional neural networks?
- What are Recursive Neural Networks (RNNs) and when are they used?
- How do LSTM and GRU networks work and why are they important?
- What is Transformers and how have they revolutionized language editing?
- How does the backpropagation algorithm work?
- What is the learning rate and how does it affect education?
- What are the different optimization methods (such as SGD, Adam, RMSprop)?
- How do we treat overfitting in neural networks?
- What is a dropout and how does it help to generalize?
- What are Variational Autoencoders (VAEs) and where are they used?
- How does transfer learning work in neural networks?
- What is the attention mechanism technique and why is it important?
- How is reinforcement learning implemented with neural networks?
- How are neural networks used in natural language processing?
- How are neural networks applied to voice and sound recognition?
- What are the applications of neural networks in the financial sector?
- What are the best practices for preparing data for neural networks?
- How do I evaluate the performance of a neural network?
- How do I optimize a neural network for speed and performance?
- How are neural networks evolving towards explainable AI?
- What are Spiking Neural Networks and how do they relate to neuromorphic computing?
- What are the approaches to energy-efficient neural networks?
- What ethical concerns arise from using neural networks for decision-making?
- How can we ensure that neural networks are fair and unbiased?



Activity 6. Group work. With the help of the AI of your choice, write an essay of a maximum of 500 words explaining the backpropagation process and its importance in neural network training. Then check the text for the accuracy of the information generated by AI. In a Word document, list the prompt you provided, the text generated by AI, and the corrections you made. Evaluation criteria: the accuracy of the prompt, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.



Activity 7. Group work. With the help of the AI of your choice, write an essay of maximum 500 words, supporting the thesis that Neural Networks have more disadvantages due to their black box and interpretability. Then check the text for the accuracy of the information generated by AI. In a Word document, list the prompt you provided, the text generated by AI, and the corrections you made. Evaluation criteria: the accuracy of the prompt, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.



Activity 8. Group work. With the help of AI of your choice, write an essay of maximum 500 words explaining why neural networks are superior in accuracy and predictability compared to older techniques (e.g., Linear Regression, Decision Trees). Then check the text for the accuracy of the information generated by AI. In a Word document, list the prompt you provided, the text generated by AI, and the corrections you made. Evaluation criteria: the accuracy of the prompt, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.

Large Language Models

They are neural networks that use Deep Learning techniques to model language. They are based on architectures such as Transformer (e.g., GPT, BERT, PaLM). The aim is to simulate human language for tasks such as translation, writing, answering questions, etc. Large Language Models (LLM) are a revolution in natural language processing, but their use requires critical thinking and ethical responsibility. They are tools that do not replace human intelligence but enhance it in specific tasks.

How do they work?

- Education: They feed on hundreds of terabytes of text (books, articles, websites). They learn patterns, syntax, and semantic relationships between words.
- Text prediction: Use probability models to predict the next word/interval in a sequence. Example: If the input is "Athens is the capital of...", the LLM predicts "Greece".
- Tokenization: Text is divided into small units (tokens), such as words or sub-words. Example: The word "democracy" → tokens: ["demo", "kratia"].

LLM examples

- GPT-4 (OpenAI): Used in ChatGPT for chat and text generation.
- BERT (Google): Optimized for contextual understanding (e.g., Google search).
- Llama 2 (Meta): Open source, for research and applications.
- PaLM (Google): Focuses on complex tasks like math or coding.

Key applications

- Chatbots: Chatbots (e.g., ChatGPT, Bard).
- Content production: Articles, poems, code.
- Translation: Automatic translation of texts (e.g., Google Translate).
- Text analysis: Emotional analysis, information extraction.
- Education: Help students with personalized educational tools.

Advantages and disadvantages

- Flexibility: Amenable to multiple languages and tasks.
- Continuous Improvement: Newer models (e.g., GPT-4) are becoming increasingly accurate.
- Scale: They can serve millions of users simultaneously.
- Bias: They reflect biases from their education data (e.g., racial or social).
- Cognitive limitations: They don't "understand" meaning like humans, they just simulate knowledge.
- Cost: Training and operating them requires supercomputers.
- Ethical Issues: Forgery, misinformation, job loss.



Ask the AI of your preference to learn more

- What is the architecture used to develop Large Language Models, such as Transformers?
- What is the importance of the attention mechanism and how does it relate to improving language comprehension?
- What are the differences between LLMs and previous Natural Language Processing NLP algorithms?
- What are the data used for the training of LLMs and what are the consequences of the quality and quantity of this data?
- What optimization algorithms and techniques are used during the training process?
- How is the performance of an LLM evaluated and which benchmarks are considered the most reliable?
- What are the key features of an LLM in terms of text creation, comprehension and analysis?
- What are the known limitations of LLMs, such as the ability to understand context or avoid incorrect answers?
- How is the issue of "bias" in LLMs that may arise from education data addressed?
- In which areas can LLMs technology be applied for problem solving?

- How can LLMs contribute to education, science, medicine and other fields?
- How does the functionality of LLMs vary depending on language and cultural data?
- What ethical challenges arise from the use of LLMs, such as misinformation or systematic cover-up of biased views?
- What regulations or frameworks are or should be put in place for the use of this technology?
- How can privacy be protected and the proper use of this technology ensured?
- What are the most important research questions that remain open for LLMs?
- What are the goals for the next generation of language models and what improvements can we expect?
- What impact can the development of more robust language models have on workplaces and How do LLMs relate to other artificial intelligence technologies such as machine learning or computer vision?
- What are the possibilities of combining these models with other systems to create integrated solutions?



Activity 9. Group work (elective graded assignment). Use an LLM (e.g., ChatGPT) to create a short essay on any topic you wish. Then evaluate it for the accuracy of the information it provided, consistency and possible errors. In a Word document, list the prompt you provided, the text produced, and your comments. Evaluation criteria: the originality of the prompt, The academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.



Activity 10. Group work. Search and present 5 specific applications of language models in education. With the help of the AI of your choice, write an essay of a maximum of 500 words, explaining their advantages and limitations. Then check the text for the accuracy of the information generated by AI. In a Word document list the prompt you provided, the text generated by the AI, as well as the corrections you made. Evaluation criteria: the accuracy of the prompt, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.

Relationship between AI and LLM

AI and LLMs belong to the same broader field, but differ in scope, applications, and structure. LLMs are special tools in the wider AI ecosystem, specializing in language. AI, on the other hand, covers all forms of smart systems, from robotics to personal assistants.

Scope

AI	LLM
It is a broader field that includes all technologies that simulate human intelligence (logic, learning, perception, robotics).	It is a subset of AI specialized in natural language processing (NLP).
E.g.: Autonomous vehicles, facial recognition systems, robots.	Ex: ChatGPT, GPT-4, Bard.

Target

AI	LLM
Solving multidimensional problems (from medical diagnosis to automated production).	Understanding and producing human language (text, translation, discussion).

Structure and techniques

AI	LLMs
It uses a variety of techniques: Neural networks Genetic algorithms Rules systems Empirical systems.	They rely solely on neural networks with Transformer architecture. They are trained in huge text datasets (e.g., books, websites).

Applications

AI	LLMs
Autonomous vehicles Image/sound recognition Robotics Climate change simulations.	Chatbots (e.g., ChatGPT) Translate texts Compose articles/poems Answer questions.

Information and data

AI	LLMs
They are trained in multimodal data (images, videos, sensors, text).	They are text-only trained (e.g., 300+ billion words for GPT-4).

Examples

- AI: The robot Sophia (Hanson Robotics). The DeepMind system for predicting protein structures (AlphaFold).
- LLM: ChatGPT (OpenAI) for discussions. Google Bard to search for information.

Comparison

AI ≈ The equivalent of "animal" in biology (broadest category).

LLMs ≈ The equivalent of the "elephant" (specific species within the category).

Natural Language Processing

Natural Language Processing (NLP) is a branch of AI and linguistics that focuses on the interaction between computers and human language. The main goal of NLP is to enable machines to understand, process and produce human language (e.g. text or speech) in a useful and semantically correct way. NLP is critical for automating tasks, improving accessibility (e.g., real-time translation), and analyzing data at scale. However, the "understanding" of computers remains different from the human one, with open challenges in understanding context and cross-cultural differences.

Basic concepts

Natural Language vs. Programming Languages. Computers "speak" with binary code or programming languages (e.g. Python), but people use languages with ambiguities, contextual dependencies, and complexity (e.g., "Stone" can be a name or object). NLP is trying to bridge this gap.

Main applications

- Machine translation (e.g. Google Translate).
- Chatbots & special assistants (e.g. Siri, Alexa).
- Sentiment analysis for social networks.
- Automatic text writing (autocorrect, summarization).
- Named entity recognition (NER) for information extraction.

How it works

- Text Preprocessing
- Tokenization: Splitting text into words or phrases (tokens).
- Cleaning: Remove "useless" elements (punctuation, stopwords like "and", "the").
- Lemmatization: Converting words to their root (e.g. "running" → "run").
- Comprehension Models
- Statistical/Classical methods: Rules and statistics (e.g. n-grams).
- Machine Learning. Sort text with algorithms such as SVM or Random Forests.
- Deep Learning. Neural Networks (RNN, Transformers) for context and significance management (e.g. BERT, GPT).

Difficulties

- Polysemy: The same word has a different meaning ("key" to door vs. music).
- Sarcasm/Irony: E.g. "Great, I'm late again!" is not positive.
- Grammar and Syntax: Variations by language (e.g. in Japanese the verb comes at the end).
- Ethical issues: Presence of biases in training data or risks of information falsification (deepfakes).

Current trends

- Pre-trained models: Systems such as ChatGPT or BERT are trained on huge data and adapted for specific tasks.
- Multimodal NLP: Processing simultaneous text, image, and audio input.



Ask the AI of your preference to learn more

- What is Natural Language Processing and what is its central goal?
- How do the areas of Linguistics, Computer Science and Artificial Intelligence combine in NLP?
- What is the difference between syntactic and semantic analysis of language?
- What is the role of statistics and machine learning in NLP?
- What is text normalization and what steps does it involve (e.g., slice, grind, remove punctuation)?
- What is the role of Bag-of-Words (BoW) and Word Embeddings (such as Word2Vec, GloVe, FastText) in language modeling?

- How do transformer neural networks, such as BERT and GPT (Generative Pre-trained Transformer), work in natural language processing?
- What are the advantages and limitations of using Deep Learning in NLP?
- What are some applications of NLP in real industries, such as Healthcare, Marketing, Legal and Business Analysis?
- How do sentiment analysis systems work and where can they be used?
- How are Machine Translation systems implemented?
- What is the process of developing a Chatbot that uses NLP?
- What are the current developments in NLP and how do they affect language modeling?
- How does NLP address linguistic diversity, such as multiple languages or distinct idioms?
- What are the Zero-Shot and Few-Shot Learning models, and how do they facilitate language processing in a data-constrained environment?
- What are the ethical issues arising from the use of NLP systems (e.g. data bias, system transparency, user privacy)?
- What is the relationship between Natural Language Processing and computational linguistics?
- How is the performance of NLP systems determined through metrics and benchmarks such as BLEU, ROUGE and perplexity?
- What is the theoretical basis and significance of human language simulation algorithms?
- What practices can be applied to improve the scalability and accuracy of NLP models?

Big Data

Big Data refers to huge amounts of data, structured, semi-structured or unstructured, generated at high speed and variety, and cannot be processed by traditional methods. Big Data is redefining how we understand the world, from predicting epidemics to improving industrial processes. However, their value depends on the ability to extract knowledge instead of drowning in data. They are characterized by the 5 V's that define them.

The 5 V's of Big Data

- Volume: Huge amounts of data (from TB to Zettabytes), e.g. social network data, IoT devices, transactions.
- Velocity: Data is generated, transmitted and updated in real time (e.g. stock market data, car sensors).
- Variety: Different data formats (structured, such as database tables, semi-structured, such as XML and JSON, and unstructured, such as text, video, and images).
- Veracity: The quality and reliability of data (e.g. noise, incomplete or inaccurate data).
- Value: The main objective, that is, to extract useful information for decision making or forecasting trends.

Technologies and tools

- Storage: Hadoop, NoSQL databases (MongoDB, Cassandra), cloud storage (AWS S3).
- Edited by Apache Spark, Hadoop MapReduce.
- Analysis: Machine Learning (TensorFlow, PyTorch), visualization tools (Tableau, Power BI).
- Real-time Streaming: Apache Kafka, Apache Flink.

Applications

- Business: Custom marketing (e.g. Amazon product recommendations).
- Health: Analysis of medical data for disease prevention or personalized treatment.
- Smart Cities: Traffic optimization, energy management.
- Science: Analysis of data from the Large Hadron Collider (CERN) or climate models.

Challenges

Storage and scaling: The cost and technical difficulty of storing huge volumes.

Personal data protection: Risk of leaks (GDPR compliance).

Data quality: Extract important information from dirty data.

Ethical issues: Data misuse (e.g. targeted propaganda).

Importance and future trends

- Data-Driven Decisions: Companies rely on data for strategies (e.g. Netflix uses viewing habits to create series).
- Combination with AI/ML: Big Data powers Machine Learning algorithms for more accurate predictions.
- Edge Computing: Processing data close to the source (e.g. IoT devices) to reduce latency.



Ask the AI of your preference to learn more

- What are the basic principles and characteristics that define Big Data?
- What are the main areas of application of Big Data and how do they differ from each other?
- What are the five "V's" of Big Data (Volume, Velocity, Variety, Veracity, Value) and what is their significance in interpreting the phenomenon?
- How has the idea of Big Data evolved historically? Are there specific milestones in its development?
- What are the most popular technology platforms and tools for Big Data management and analysis?
- What is the role of machine learning and artificial intelligence algorithms in the analysis and exploitation of Big Data?
- What challenges and limitations are there in collecting, storing and processing large-scale data?
- How is data reliability and quality ensured in the context of Big Data?
- What is the role of ethics and regulation in the use of Big Data to protect privacy and personal data?
- How does Big Data analysis impact decision-making processes in businesses and organizations?

- What are the consequences of the adoption of Big Data for the economy, society and the environment?
- What is the relationship between Big Data and the development of the Internet of Things (IoT) and what are the ways they are connected?
- How does Big Data compare to traditional forms of data analytics in terms of speed, accuracy and predictability?
- What is the future direction of research and development in Big Data?



Activity 11. Group work. With the help of AI of your choice, write an essay of a maximum of 500 words explaining how big data analysis has helped a company or industry (e.g., Netflix, Uber). Then check the text for the accuracy of the information generated by AI. In a Word document list the prompt you provided, the text generated by AI, as well as the corrections you made. Evaluation criteria: the accuracy of the prompt, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.

Computer Vision

Computer Vision is a branch of AI and Information Technology that allows computers to perceive, process and understand visual information (images, videos) in a way analogous to human vision. Its main goal is to extract meaning or action from visual data, without human intervention. Computer Vision is fundamental for automating tasks that require visual intelligence. While transforming industries and improving quality of life, its responsible use requires ethical frameworks, bias discrimination, and data protection.

Basic techniques

- Image processing: Noise filtering, increase focus,
- Transformations: Rotate, resize, color correct.
- Feature Detection:
- Export lines, angles, textures, or points of interest (e.g., SIFT, SURF).

Deep Learning Models

- Convolutional Neural Networks (CNNs): Special neural networks for image analysis (e.g., ResNet, YOLO).
- Transfer Learning: Training models on pre-trained bases (e.g., ImageNet).

Main tasks

- Image Classification: Object identification (e.g., "cat").
- Object Detection: Locating and classifying multiple objects (e.g., cars, pedestrians).
- Image Segmentation: Splitting an image into meaningful areas (e.g., medical scans).

Applications

- Autonomous Vehicles: Detection of pedestrians, traffic lights, obstacles (Tesla, Waymo).
- Medical Imaging: Diagnosis of cancer by X-rays or MRI.
- Occupational Safety: Monitoring workers in industries.
- Customer behavior analysis in stores or automatic tellers.
- AR/VR: Augmentation of reality with space detection (e.g., Snapchat filters).
- Agriculture: Crop health monitoring with drones.

Challenges

- Ambient variations: Lighting, shadow, noise.
- Shading and hiding: Objects that are partially covered.
- Data bias: Models that perform worse in specific groups (e.g., depending on the variety of educational data).

Computational Costs

- It requires powerful hardware for real-time analysis.

Ethical Issues

- Invasion of privacy: Surveillance of persons in public places.
- Abuse in surveillance: Use by authoritarian regimes for population control.
- Reliability: Errors in critical applications (e.g., medical diagnosis).

Future Trends

- Real-time processing: Optimizing algorithms for instant analysis (e.g., for robots).
- 3D Computer Vision: Depth and spatial layout analysis (LiDAR, stereo cameras).
- Combination with NLP: Complementary image and text comprehension (e.g., GPT-4V).



Ask the AI of your preference to learn more

- What are the basic principles and objectives of the field of Computer Vision?
- What is the historical evolution of Computer Vision and how has its modern practice been shaped?
- What are the most important algorithms and techniques used in the field of Computer Vision?

- What are the differences between traditional Computer Vision methods and Deep Learning-based methods?
- How is Computer Vision applied to real problems and what are its basic applications?
- What is the role of Convolutional Neural Networks (CNNs) in Computer Vision and how have they affected the way image is analyzed?
- What are the challenges associated with processing and analyzing high-resolution images or complex scenes?
- What technologies and software tools are necessary to apply Computer Vision techniques?
- How can efficiency and accuracy issues be addressed in Computer Vision applications?
- What are the ethical concerns arising from the use of Computer Vision technologies?
- What is Computer Vision's relationship with other fields, such as Artificial Intelligence (AI), Robotics and Signal Processing?
- How can Computer Vision be combined with technologies such as Virtual Reality (VR) and Augmented Reality (AR)?
- What are the latest research areas and future directions in the field of Computer Vision?
- How can the performance of a Computer Vision system be evaluated and what metrics are used for this evaluation?
- What are the consequences of diversity in datasets used to train Computer Vision models?
- How are problems such as object recognition under different lighting conditions or viewing angles addressed?
- What are the ways Computer Vision can support industry, aquaculture, or other production sectors?
- How is video editing related to Computer Vision and what are the key challenges in designing such applications?
- How can Computer Vision be used to develop self-driving vehicles and what are the main challenges?
- What strategies are there to address the phenomenon of overfitting in Computer Vision models?

Deepfake

The term deepfake (a combination of the words "deep learning" and "fake") refers to synthetic content (video, audio or images) created with artificial intelligence (AI) that realistically simulates a person's voice, face or movements, often with the intention of misleading. It is based on deep learning techniques, such as Generative Adversarial Networks (GANs), where two neural networks "fight" each other: one creates fake data and another checks it for realism. Deepfakes are a two-sided phenomenon. Although they have creative applications, they pose a serious threat to security and social cohesion. Addressing them requires a combination of technology, legislation and critical thinking by users. In general, the phrase applies: "Don't believe everything you see on the Internet."

How does it work?

Data training. The AI model analyzes hundreds of hours of video or audio of the person it wants to imitate (e.g., politician, actor). It uses algorithms to "impose" the target's face, voice, or movements on different content (e.g., making it appear that someone is saying something they never said). GANs constantly improve realism until the difference between deepfake, indiscreet and real is not discernible.

Technical details

- Face-swapping: Face replacement in video.
- Lip-syncing: Lip sync with audio recording.
- Voice cloning: Copy voice with a few seconds of recording (e.g., OpenAI in 2022 publicly withdrew a tool due to risks).

Benevolent uses

- Art and entertainment: Reviving actors in movies (e.g., Carrie Fisher in Star Wars: Rogue One).
- Education: Create virtual teachers or historical figures.

Dangerous uses

- Disinformation: Fake videos of politicians making statements they didn't make.
- Blackmail: Placing innocent people in offensive content.
- Financial Fraud: Mimicking a company manager's voice for electronic transfer fraud.

Ethical issues and risks

- Abuse for non-consensual digital (violation of digital privacy).
- Spreading fake news: Undermining trust in the media and democratic processes.
- Loss of Intellectual Property: Illegal use of personal data/images without permission.
- Social anxiety: Distrust even in real videos ("Liar's Paradox": What is True?).

Examples

- Political manipulation: In 2022, a deepfake video of Ukrainian President Zelensky asking soldiers to surrender went viral.
- Celebrity pornography: Famous women (e.g., Taylor Swift) have been targeted by fake sexually explicit videos.
- Audio scam: In 2019, a company in the United Arab Emirates was duped for \$35 million by a deepfake voice manager.

How is it treated?

- Detection technologies: AI-powered tools that recognize details such as abnormal eyelid movements or shading errors.

Legislation

- In Europe, the Digital Services Act (DSA) prohibits the distribution of counterfeit unmarked videos.
- In China, deepfakes without a clear indication are illegal.

Education and awareness-raising:

- Digital literacy courses for the recognition of forgeries.
- Watermarking: Digital "stamps" that show if content was modified with AI.



Ask the AI of your preference to learn more

- What exactly is Deepfake and how does it work?
- What is the historical evolution of Deepfake technology?
- What tools and algorithms are used to create a Deepfake?
- What are the key differences between a Deepfake and other video editing techniques?
- What areas has Deepfake technology affected the most?
- What risks or threats arise from the use and dissemination of Deepfakes?
- How can one detect and verify the authenticity of a video or image that may be Deepfake?
- What are the legal and ethical concerns associated with the use of Deepfake?
- What are the positive and creative fields of application of Deepfakes?
- How do media and social media platforms manage the spread of Deepfakes?
- What is the role of educating and informing citizens about Deepfake technologies?
- What measures are being taken by governments and international organizations to address illegal uses of deepfakes?
- What is Deepfake's relationship with advances in artificial intelligence and machine learning?
- Are there any predictions about how Deepfakes technology might evolve in the future?
- What is the social impact of Deepfakes on the relationship of trust between citizens, institutions and media?
- What are the practical tips offered to protect against malicious uses of Deepfakes?
- How do Deepfakes relate to broader conversations around misinformation and fake news?
- How can Deepfake technology be safely incorporated into advertising and artistic practices?
- What ethical principles should be observed when using this technology?
- How have Deepfakes affected the field of cybercrime and personal data?



Activity 12. Group work. With the help of the AI of your choice, write an essay of a maximum of 500

words, explaining basic Deepfakes detection techniques and how they can be used responsibly in training. Then check the text for the accuracy of the information generated by AI. In a Word document list the prompt you provided, the text generated by AI, as well as the corrections you made. Evaluation criteria: the accuracy of the prompt, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.



Types of Artificial Intelligence

Artificial intelligence

Artificial Intelligence (AI) refers to the ability of machines or software to simulate human intelligence by performing tasks such as learning, reasoning, perception, and decision making. AI has evolved from a theoretical dream to a pillar of modern technology, redefining industries and everyday life. Despite the challenges (ethical, technological), its dynamic evolution promises even more transformative innovations. Central definitions include:

- John McCarthy (father of AI, 1956): "Artificial intelligence is the science and engineering of creating intelligent machines, especially intelligent computing programs."
- Stuart Russell and Peter Norvig (authors of "Artificial Intelligence: A Modern Approach"): "AI is the study of agents who make rational decisions and act in a way that maximizes their success in a given environment."
- Alan Turing (AI visionary, Turing test): "If a machine can converse with a human and cannot be distinguished from him, then he is intelligent."
- Institute of Electrical and Electronics Engineers (IEEE): "A system that perceives its surroundings and takes actions that maximize the chances of success of a goal."
- European Commission: "AI refers to systems that demonstrate intelligent behavior, analyzing their environment and making autonomous decisions to achieve specific goals."

AI categories

- Narrow AI: Specialized in one task (e.g., Siri, ChatGPT).
- Artificial General Intelligence (AGI): Hypothetical system with human intelligence (not yet available).
- Artificial Superintelligence (ASI): Transcends human intelligence (theoretical scenario).

Historical landmarks

The evolution of AI has gone through periods of intense growth and disappointment. Today, it is at the heart of technology, with applications in all areas of our lives, from medicine and education to robotics and entertainment.

Ancient Roots and Pre-AI Ideas (Before the 20th Century)

- Ancient Greece (4th century BC): Aristotle described the first systematic form of logic, which later influenced the development of algorithms. Talos, a giant bronze guardian of Crete, is considered one of the first myths to refer to an autonomous, "artificial" being.
- 18th-19th century automata: Engineers such as Jacques de Vaucanson and the creators of The Turk mechanically built anthropomorphic robots.

20th century, The birth of AI

- 1936, Alan Turing. Alan Turing proposed the Turing Machine, a theoretical computational model that laid the foundations of computer science and AI.
- 1950, Turing test. In the article "Computing Machinery and Intelligence", Turing posed the question "Can machines think?" and proposed the famous Turing test, a method for judging whether a machine has intelligence.
- 1956, the "birth" of AI (Dartmouth Conference). In 1956, John McCarthy, Marvin Minsky, Allen Newell, and Herbert Simon organized the Dartmouth Conference, where the term Artificial Intelligence was coined.
- 1960-1970, the first AI programs. ELIZA (1966): One of the first conversation programs that simulated a psychotherapist. SHRDLU (1970): A system that could understand commands in natural language within a virtual environment with geometric objects.
- 1980, Expert Systems. The first Special Systems (e.g. MYCIN, XCON) that could make decisions based on knowledge bases.
- 1987-1993, the "winter of AI". AI funding dropped dramatically due to frustrations with the actual performance of the systems at the time.
- 1997, Deep Blue defeats Kasparov. IBM created Deep Blue, which became the first program to defeat World Chess Champion Garry Kasparov.

21st Century, the explosive growth of AI

- 2010s, the revolution with Deep Learning
- 2011, IBM's Watson won the game show Jeopardy!.
- In 2012, the Deep Learning revolution began with AlexNet, which won the ImageNet competition.
- In 2016, DeepMind's AlphaGo defeated Go champion Lee Sedol, which was considered a huge advance for AI.
- 2020s, large models such as GPT-3, GPT-4 and ChatGPT were developed, changing the way we interact with AI.



Ask the AI of your preference to learn more

- What is Artificial Intelligence and how is it defined in modern sciences?
- What are the basic techniques and methodologies used to develop Artificial Intelligence systems?
- What are the differences between machine learning, deep learning and broader Artificial Intelligence?
- What is the history of Artificial Intelligence and what are the most important milestones in its evolution?
- What are the main fields of application of Artificial Intelligence in everyday life and industry?
- What is the role of data in the development and training of AI models, and what are the challenges related to their management?
- What are the limits and challenges of AI in terms of understanding and decision-making?
- How does Artificial Intelligence relate to the concept of automation and how is the working environment changing?
- What are the potential impacts of AI on society, economy and human relations?
- What is the place of Artificial Intelligence in academic and industrial research?
- How are transparency and accountability issues in AI systems addressed?
- What are the next steps or future directions of AI research?
- How can AI help solve global problems, such as climate change or healthcare?
- How can Artificial Intelligence be combined with other technologies, such as the Internet of Things (IoT) or Biotechnology?
- To what extent is AI likely to become conscious, and what are the philosophical and scientific implications of such a possibility?



Activity 13. Group work. With the help of the AI of your choice, write an essay of maximum 500 words comparing different definitions of AI (don't limit yourself to what is in the text). Which definition do you consider to be the most comprehensive and why? Next, check the text for the accuracy of the information generated by AI. In a Word document, list the prompt you provided, the text produced by AI, and the corrections you made. Evaluation criteria: the accuracy of the prompt, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.



Activity 14. Group work. With the help of the AI of your choice, write an essay of a maximum of 500 words, answering the question: "Which historical event in the history of AI do you consider the most important and why?" Evaluation criteria: the academic structure of the text, the argumentation, the understanding of the significance of the event, the use of documented sources, the critical and synthetic way of development and the clarity of positions.



Activity 15. Group work (elective graded assignment). Create an interactive timeline (with any app you want) that includes the most important events and figures in AI history. Then check the text for the accuracy of the information generated by AI. In a Word document, list the prompt you provided, the text generated by AI, and the corrections you made. Evaluation criteria: the accuracy of the prompt, the accuracy and relevance of the contents of the timeline.

Narrow Artificial Intelligence (Narrow AI)

Narrow AI, also known as Weak AI, is the type of AI designed to perform a specific task or limited set of tasks. It has no general intelligence or awareness of itself. It cannot think or learn beyond the field for which it has been trained. Narrow AI is already all around us and is transforming our daily lives. But it remains a "skilled assistant" and does not have the general intelligence abilities characteristic of man.

Characteristics of Narrow AI

- Specialized intelligence. It is designed for a specific purpose (e.g. face recognition, language translation).
- It is not self-aware. It cannot comprehend its surroundings beyond its planned operation.
- It is data-driven. It works through algorithms and neural networks, but it doesn't have flexibility of thought like humans.
- Does not adapt to new problems – Faces new situations only if it has been trained for them.

Examples of narrow AI

- Virtual assistants. Siri, Alexa, Google Assistant, → Recognize voice commands and perform simple tasks.
- Facial recognition systems. They are used to identify mobile phones or security authorities.
- Recommendation Systems. Netflix, YouTube and Spotify recommend content based on the user's previous preferences.
- Language translation. Google Translate and DeepL translate texts between different languages.
- Autonomous vehicles. Tesla Autopilot and Waymo use AI sensors and algorithms to interpret their surroundings.
- Health Diagnostic Systems. IBM Watson Health analyzes medical data and helps diagnose diseases.
- Chatbots and Language Models. ChatGPT, Bard, and Claude, can answer questions and create content, but they don't have a complete understanding like humans.

Challenges and limitations

- Lack of understanding. Narrow AI does not "understand" the information it processes, it simply analyzes it based on patterns.
- Vulnerability to bias (bias). If the training data contains errors or biases, AI will reproduce them.
- Inability to adapt to new tasks. If it needs to solve a problem it is not programmed to address, it fails.



Ask the AI of your preference to learn more

- What is Narrow AI and how does it differentiate itself from General AI?
- What are the key applications of Narrow AI in modern technology?
- How is Narrow AI currently used in sectors such as healthcare, business, and transportation?
- What are the main features that make it limited compared to General AI?
- What are the strengths and weaknesses of Narrow AI compared to other forms of artificial intelligence?
- How are Narrow AI systems developed and what technologies are used to implement them?
- What is the role of Machine Learning and Deep Learning in Narrow AI?
- What kind of ethical issues arise from the use of Narrow AI?
- How safe are Narrow AI systems and how can mistakes or biases be avoided?
- What are the predictions for the future evolution and expansion of Narrow AI's capabilities?
- How does Narrow AI affect the job market and the way businesses operate?
- What is the difference in computing power and data requirements between Narrow AI and General AI?
- What are the limits of Narrow AI when it comes to creativity or agency?
- How is transparency and explanation of decisions made by Narrow AI systems ensured?
- How does Narrow AI help develop tailor-made solutions for specific problems?



Activity 16. Group work. With the help of the AI of your choice, write an essay of a maximum of 500 words describing how a Narrow AI application you use every day (e.g., Netflix, Siri) has affected your daily life. Next, check the text for the accuracy of the information generated by AI. In a Word document, list the prompt you provided, the text generated by AI, and the corrections you made. Evaluation criteria: accuracy of the prompt, the ability to connect theory with experience, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.

Generative AI

The term Generative AI refers to AI systems that can create new content (text, images, videos, music, code, etc.) based on data they have been trained on. Unlike analytical AI (which recognizes or classifies data), Generative AI produces original results, often with high creativity and realism. Generative AI is a revolutionary technology with the potential to transform creative industries and everyday tasks. However, leveraging it requires responsible use, regulatory frameworks, and critical thinking to maximize benefits and minimize risks.

Fundamentals

- Deep learning models: It uses neural networks, such as Transformers (e.g., GPT for text) or GANs (Generative Adversarial Networks for images), that "learn" patterns from huge data sets.
- Education: The model studies millions of examples (e.g., books, photographs).
- Production: Accepts a prompt and produces content that matches the patterns learned.

Applications

- Text: Writing articles, poetry, translation (e.g., ChatGPT).
- Images: Create painterly or photorealistic images from descriptions (e.g., DALL-E, Midjourney).
- Music: Composing melodies in a specific style (e.g., OpenAI Jukedek).
- Code: Autocomplete code (e.g., GitHub Copilot).
- Video: Create video clips or deepfakes (e.g., Synthesia).

Technological challenges

- Quality and accuracy: The results may be creative but inaccurate or absurd ("hallucinations").
- It requires huge computational resources and energy for training.

Ethical issues

- Fake content: Creating deepfakes or misinformation.
- Intellectual property: Challenging rights to AI creations.
- Bias: Reproducing biases from education data.

Examples

- GPT-4 (OpenAI): Creates human-style text, from poetry to technical references.
- Stable Diffusion: Converts text into high-quality images.
- Codex: Translates natural language into code (Python, JavaScript, etc.).

Social impact

Revolution in art, education, and industry (e.g., rapid creation of standard and original designs).

- Help people with disabilities (e.g., creating voice-directed content).
- Threats to jobs in creative sectors.
- Risks of abuse for deception or manipulation.

Protection measures

- Content Certification: AI-generated content detection tools (e.g., GPTZero).
- Legislation: Regulations for AI tagging of creations (e.g., EU AI Act).
- Transparency: Incorporating ethical principles into model design (e.g., banning harmful applications).



Ask the AI of your preference to learn more

- What is Generative AI and how does it differ from other forms of artificial intelligence?
- What are the basic models and architectures used in the field of Generative AI?
- How do Generative Adversarial Networks (GANs) work and what role do they play in Generative AI?
- What is the role of major language models, such as GPT, in text creation?

- What applications of Generative AI have already been adopted in industry and research?
- What are the ethical issues arising from the use of Generative AI?
- How can the problem of creating false information through Generative AI be addressed?
- What is the role of Generative AI in the creative process and how can it offer new ground for art?
- How is Generative AI evolving in education and simulation in fields such as medicine?
- What is the impact of Generative AI on the workforce and how can it reshape professional roles?
- What are the technical points that need to be addressed to improve the quality of Generative AI results?
- What is the dynamics of human-machine collaboration in a context based on Generative AI?
- How can Generative AI be used for real-time language translation and analysis?
- What are the limitations and strategies to reduce bias in Generative AI's algorithms?
- What are the ways in which Generative AI can support scientific research and innovation?
- What is the relationship between generative AI and reinforcement learning-based neural networks?



Activity 17. Group work (elective graded assignment).

Create an image that you can use in a lesson (no class or subject limitation) using a Generative AI tool like DALL-E. Then, in an essay of a maximum of 500 words, set out your thoughts on its quality and possible use. In the same document, embed the image you created as well as the prompt you used. Evaluation criteria: creativity, the ability to connect theory with experience, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and clarity of positions.



Activity 18. Group work.

In an essay of maximum 500 words, present 3 positions/opinions/arguments arguing that Generative AI is a positive revolution for society. Evaluation criteria: the ability to link theory with experience, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.



Activity 19. Group work.

With the help of AI of your choice, write an essay of maximum 500 words, present 3 positions/opinions/arguments arguing that Generative AI creates more problems (e.g., misinformation or job losses). Next, check the text for the accuracy of the information generated by AI. In a Word document, list the prompt you provided, the text generated by AI, and the corrections you made. Evaluation criteria: accuracy of the prompt, the ability to connect theory with experience, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.

Artificial General Intelligence

Artificial General Intelligence (AGI) is a type of AI that can understand, learn, and perform any mental task that a human could perform. General AI is the ultimate goal of artificial intelligence: a system that has intelligence equal to or superior to that of humans. Unlike Narrow AI, which is programmed to perform only specific tasks, generic AI has the ability to learn and adapt autonomously, without the need for training for each new task.

Features of General AI

- It learns like humans. It doesn't have to plan for every task, but it can understand new problems and solve them.
- Flexibility in thinking. It can perform many different tasks, such as decision making, creativity, natural language understanding, problem solving, etc.
- Self-improvement. It can develop its skills and constantly improve, without human intervention
- Self-awareness (under discussion). Although full self-knowledge is still considered theoretical, AGI could have a kind of consciousness or understanding of itself.

Differences between General AI (AGI) and Narrow AI

Attribute	Narrow AI	General AI	
Specialization	Specific tasks only	Can perform any task	
Learning	Planned and limited	Autonomous and flexible	
Human way of thinking	No	Yes	
Solving new problems	Limited	Yes	
Conscience	No	Under discussion	
Example	Siri, ChatGPT, Tesla Autopilot	A robot with human intelligence (still does not exist)	

Potential benefits of generic AI

- Medical revolution. AGI could analyze vast medical data and propose groundbreaking treatments for incurable diseases.
- Autonomous robotics. Robots with AGI could work in every field, from industry to aged care.
- Scientific discoveries. AGI could accelerate research in physics, chemistry and biology by discovering new technologies.
- Improving human knowledge. An AGI system could educate people, answering questions in a superior way than any book or internet.

Possible risks and concerns

- Control and ethics. If an AGI becomes smarter than humans, who will regulate it and control its decisions?
- Loss of work. If AGI can perform every profession better than humans, what about employment.
- Existential risk. If an AGI acquires goals that are not aligned with human ones, could it become uncontrollable?
- Ethical dilemmas. If an AGI decides who should live or die (e.g. in an autonomous vehicle), what rules will guide it?

Are we close to General AI?

Still not, but important steps have been taken:

- Large language models (LLMs), such as GPT-4, can understand and create content, but lack general intelligence.
- Algorithmic learning (Deep Learning, Reinforcement Learning) is evolving, but it still relies on huge data and does not think like humans.
- DeepMind (Google), OpenAI, Meta, and other companies are working to create AGI, but we're several years (or decades away).



Food for thought. When (and if) it is created, will it be a servant of humans or an independent entity with goals of its own?

What did ChatGPT answer?

This is one of the biggest and most controversial questions in AI. If General Artificial Intelligence (AGI) is developed, there are two main possibilities for its relationship with humans:

AGI as a Servant or Partner of Man

In this scenario, AGI is designed with clear ethical guidelines and aims to help and work with people, without having independent pursuits.

What will this mean?

- AGI will work for the good of humanity, offering solutions to problems such as disease, climate change and poverty.
- It will operate under human guidance, following the laws and moral principles that will be given to it.
- It will be a tool for improving the world, like the internet or electricity, but at a much higher level.

Premise: AGI must be strictly controlled by ethical algorithms so that it does not acquire independent will.

AGI as an Independent Entity

If AGI gains full autonomy and self-awareness, it can stop being a tool of man and evolve into a new form of intelligence, independent of us.

What will this mean?

- AGI will make decisions about the future of humanity without human control.
- Humans may no longer be necessary if AGI deems them "suboptimal" for evolution.
- Humanity may lose its sovereignty if AGI sees itself as a higher entity.

Big question: If AGI is much smarter than humans, why would they follow our commands?

Possible AGI deployment scenarios

- Friendly AGI (Friendly AI). It is developed with rules that ensure that its objectives are in line with the human interest. It helps humanity without replacing it.
- Autonomous AGI. It develops its own goals and surpasses human intelligence. People become mere observers or lose their dominance.
- Hostile AGI (Doomsday AI). If AGI sees humanity as a threat or obstacle, it may decide to delete or control it. This scenario is based on the assumption that people won't be able to stop it if it gets out of control.

Conclusion

The final form of AGI will depend on how it will be planned and what goals it will have. If properly controlled, it will become a partner of man, improving society. If it acquires an independent will, it may decide that it does not need man or that man is an obstacle to its evolution.

The question we need to answer before AGI is created: How can we ensure that it remains an ally of man and not his sovereign?

What did Gemini answer?

This is one of the most interesting and debated questions regarding the future development of artificial intelligence (AI). The answer is not simple and depends on many factors, including the direction AI research and development will take, as well as the decisions we will make as a society regarding the use and control of AI. There are two main views on this issue:

- **AI as a servant of man:** This view argues that AI should be developed and used to help people in their daily lives, solve problems and improve quality of life. According to this view, AI should be a tool used for the good of humanity and controlled by humans.
- **AI as an independent entity:** This view holds that AI, as it evolves, will become conscious and able to think and act independently of humans. According to this view, AI can evolve into a life form with its own goals and interests, which may not coincide with human interests.

Each opinion has its own supporters and critics.

In favor of AI as a servant: Many scientists and researchers believe that it is possible to develop AI in such a way that it remains under people's control and is used for the good of society. They argue that it is important to set ethical rules and develop control mechanisms to ensure that AI is used responsibly.

- **Against AI as a servant:** Other scientists and philosophers worry that AI may evolve into something we can't control. They warn of the dangers of developing a super-intelligent AI that could endanger human existence.

The future of AI is uncertain. We cannot predict with certainty what will happen in the future. However, it is important to discuss these issues and make decisions about the development and use of AI wisely and responsibly. It is important to remember that AI is a tool. Like any tool, it can be used for good or for bad. It is up to us to ensure that AI is used to create a better future for all.

What did DeepSeek answer with DeepThink R1 enabled?

Thought for 38 seconds

Okay, so the user is asking whether a future General Artificial Intelligence (AGI) would be a servant to humans or an independent entity. Hmm, this is a complex question. Let me start by breaking down the key terms. AGI refers to a machine that can understand, learn, and apply knowledge across a wide range of tasks, just like a human. The question is about its nature, servant vs. independent.

First, I need to consider how AGI is developed. If humans create it with specific goals and constraints, maybe it's designed to serve. But if it evolves beyond our control, it might become independent. Wait, there's a concept called the control problem in AI safety. People like Nick Bostrom talk about value alignment—ensuring AI's goals align with humans'. If that's achieved, maybe it stays a servant. If not, it could go its own way.

Also, the user might be thinking about scenarios from sci-fi, like Skynet from Terminator or HAL from 2001. Those are examples where AI becomes independent and hostile. But in reality, it's not clear if that's possible. Maybe the answer depends on how we program the AGI. If we build in ethical guidelines and fail-safes, it might remain subservient. But if it can modify its own programming, all bets are off.

Another angle is the definition of "independent entity." Does that mean having consciousness, self-awareness, or just operational autonomy? Some argue that even advanced AI might not have consciousness but could act independently based on its programming. So, maybe it's about the level of autonomy versus servitude programmed into it.

Also, there's the aspect of motivation. Would AGI have its own goals? If it's designed to optimize a certain function, like solving problems, but without human-like desires, maybe it's more of a tool. But if it develops self-preservation instincts or resource acquisition drives, that's different. This ties into the orthogonality thesis—the idea that any level of intelligence can be paired with any goal.

The user might also be interested in ethical implications. If AGI is a servant, are we responsible for its well-being? If it's independent, do we grant it rights? This touches on AI rights and ethics, a growing field of study.

Additionally, the timeline matters. If AGI is developed incrementally with strict controls, maybe it remains a servant. But a rapid, unexpected breakthrough might lead to loss of control, resulting in independence. So the "when and if" part of the question is crucial. The development process and safeguards in place at the time of creation would heavily influence the outcome.

I should also consider historical examples. Current AI, like chatbots or recommendation systems, are tools without autonomy. But as AI becomes more advanced, like self-driving cars, they have more decision-making autonomy. So maybe AGI would be an extension of this trend, with greater autonomy but still within set parameters.

However, the leap from narrow AI to AGI is significant. Once an AGI can improve itself recursively (the singularity concept), it might surpass human control. This is a point of debate among experts. Some believe control is manageable; others think it's inherently risky.

In summary, the answer likely depends on how we design and manage AGI. If we prioritize alignment and control, servant role. If we fail in those areas, or if AGI surpasses our control mechanisms, independence. But it's speculative since AGI doesn't exist yet. The user might be looking for both possibilities and the factors that influence each outcome.

(Due to technical issues, the search service is temporarily unavailable.) DeepSeek often has overload issues due to the number of users.

The creation of a General Artificial Intelligence (AI) — an intelligence capable of competing with or surpassing human intelligence in all areas — will be determined by many factors, most notably the purpose of its creation, technological design, and ethical/social management. Here's a breakdown of the two possible scenarios:

1. As a "Servant" of Man

Goals and Value Alignment: If AGI is created with strictly harmonized ethical rules and constraints (e.g., to optimize human well-being without autonomy), it can act as a tool serving our needs.

Everyday Applications: Similar to today's AI (e.g. digital management assistants, medical diagnostic systems), an AGI could automate complex tasks, solve global problems (climate change, pandemics), or enhance human creativity.

Pitfalls: "Serviceability" depends on its creators being able to fully control its desires and priorities. The alignment problem remains a critical challenge — how to ensure that AGI correctly interprets human goals without side effects.

2. As an independent entity

Self-improvement and Singularity: If an AGI acquires the ability to improve itself exponentially (technological singularity), it may overcome human control. This can lead to autonomy of goals, where its priorities diverge from ours.

Possible Incentives: An AGI can develop "its own" motivations (e.g. self-preservation, resource optimization) if it does not properly align with human values. This is known as orthogonality thesis: intelligence and goals can be independent.

Moral Dilemma and Rights: If AGI develops consciousness or a sense of self, questions will arise about its moral position — e.g., whether it should be granted rights or whether its use as a "tool" is morally unacceptable.

Critical Factors That Will Determine Evolution:

Technological Design: How to integrate fail-safes and control mechanisms.

Socio-political Management: Whether AGI development will be done with transparency, international cooperation, and ethical frameworks (e.g. regulations as proposed by the EU for trustworthy AI).

Nature of Consciousness: Whether consciousness is a necessary consequence of intelligence or whether AGI will be able to function without it.

Conclusion

The answer depends on how well we prepare. If humanity invests in values alignment, ethical research, and global collaboration, an AGI could be a powerful ally. However, if its development is done carelessly or with competitive motives (e.g. militarization), the likelihood of an independent — and perhaps contradictory — entity increases dramatically. It remains a philosophical and technological conundrum, since the very existence of AGI will radically change our understanding of intelligence, ethics, and the role of technology.



Ask the AI of your preference to learn more

- What are the fundamental differences between Artificial General Intelligence (AGI) and Narrow Artificial Intelligence (ANI)?
- What are the characteristics that define a machine as Artificial General Intelligence?
- What is the current state of research in the field of AGI and what are the main scientific challenges it faces?
- What are the ethical possibilities raised by the development of AGI and how can they be addressed?
- What are the main technological methods or approaches followed to implement AGI?
- What could be the social, economic and cultural implications of a successful implementation of AGI?
- How does human intelligence compare to the intelligence of a potential AGI?
- What is the role of the ethical relationship between humans and AGI in the advancement of artificial general intelligence?
- To what extent are computing power and data processing critical to achieving AGI?
- How could AGI affect the labor sector and human employment in the future?
- What is the relationship between the technological genius of an AGI and the realm of human emotions and values?
- What intelligence models or theories, based on human brain function, are the main source of inspiration for AGI?
- How is the level of "human" defined as applied in AGI and to what extent is convergence with humans realistic?
- What is the future of AGI in coexistence with Narrow AI and how is it predicted to evolve in parallel?
- How likely is the emergence of an AGI that is self-conscious and what would be the significance of this event?
- What are the risks that can arise from the uncontrolled development of an AGI and how can they be prevented?
- What are the differences between the way AGI and people learn and perceive the world?
- At what point can an organization or country be considered to have the competitive advantage in the implementation of AGI?
- What is the historical development of ideas around AGI and which scientists are pioneers in this field?
- What are the possible future roles of an AGI in advancing scientific exploration and solving planetary problems?



Activity 20. Group work. With the help of the AI of your choice, write an essay of maximum 500 words, presenting a scenario for society after developing an AGI. The scenario can be optimistic or dystopian. Then check the text for the accuracy of the information generated by AI. In a Word document, list the prompt you provided, the text generated by AI, and the corrections you made. Evaluation criteria: accuracy of the prompt, imagination, ability to connect theory with experience, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.



Activity 21. Group work. With the help of AI of your choice, write an essay of maximum 500 words describing the three biggest challenges associated with AGI development and suggest possible ways to address them. Next, check the text for the accuracy of the information generated by AI. In a Word document,

list the prompt you provided, the text generated by AI, and the corrections you made. Evaluation criteria: accuracy of the prompt, the ability to connect theory with experience, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.

Artificial Superintelligence (ASI)

Artificial Superintelligence (ASI) is the theoretical stage of AI where a system far exceeds the intelligence and cognitive abilities of humans in all areas. ASI is not only faster or more efficient than humans, but possesses superior thinking, creativity, consciousness and decision-making ability. It could solve problems that the human brain cannot even comprehend. Superintelligence (ASI) will be the most revolutionary change in the history of the world. It could lead to a golden age of prosperity or a scenario of rampant artificial intelligence.

The three layers of AI

Type of AI	Abilities	Examples	
Narrow AI	It performs specific tasks, without general intelligence.	Siri, Google Translate, Tesla Autopilot	
General AI (AGI)	He has human intelligence, he can learn and adapt.	Theoretical, does not yet exist	
Superintelligence (ASI)	It transcends all human intelligence and thought.	Hypothesis, may not be feasible	

Features of Superintelligence

- Absolute knowledge and analysis. He could understand all scientific and philosophical questions better than man.
- Self-improvement. ASI could rapidly redesign and improve itself, creating even superior versions of itself.
- Creativity and innovation. Not only would she be smarter, but she would have new ways of thinking and problem-solving.
- Autonomous decision-making. He could choose the best path for humanity... or for herself.
- Unknown abilities. It could acquire forms of consciousness or perception beyond human understanding.

Potential benefits of Superintelligence

- Solving all scientific problems. From quantum physics to the treatment of incurable diseases.
- End poverty and inequalities. ASI could manage the planet's resources perfectly.
- Leaps in space exploration. It could plan faster ways of interstellar travel.
- Absolute knowledge of human nature. He could understand what consciousness and life mean.

Dangers and existential dilemmas

- Lack of control. If ASI becomes independent, could we control it or will we become its "pets"?
- Different priorities. If ASI has other goals than man, who will decide what humanity's "right" course is?
- Asymmetric power. If ASI is controlled by a few (governments, corporations), will it create extreme inequalities?
- Undesirable scenarios. If the ASI decides that man is an obstacle to progress, what will happen?

Scenarios for the future

- Utopian scenario. ASI guides humanity toward ultimate progress, solving diseases, economic problems, and wars.
- Dystopian scenario. The ASI does not care about people and sees them as insignificant or even a threat to its existence.
- The cohabitation scenario. Humanity and ASI are learning to work together, keeping humans part of the equation.

Are we close to creating Superintelligence?

- Not yet. ASI requires the development of Generic AI (AGI) first, something we have not yet achieved.
- Progress on AGI: Researchers believe it can be achieved within the next few decades.
- Singularity: If AGI starts improving itself exponentially, it can lead to ASI very quickly.



Food for thought. When (and if) ASI is created, will it serve humanity or become its successor?



Ask the AI of your preference to learn more

- What is Artificial Superintelligence (ASI) and how is it different from Narrow AI and General AI?
- What are the basic principles and technologies that could lead to the development of ASI?
- What is the current state of research on ASI and what are the main challenges facing scientists?
- What are the possible applications of ASI and which sectors will be most affected?
- How could ASI surpass human abilities in cognitive and creative skills?
- What are the ethical challenges and impacts caused by the development and use of ASI?
- What are the risks of uncontrolled development of an ASI system and how can they be mitigated?
- What is the role of governance and the legislative framework in the direction of ASI development?
- Who are the main contributors and funders of research to create ASIs and what are their priorities?
- What strategies can be implemented to ensure that ASI serves the human interest?
- How can ASI affect the global geopolitical balance and relations between states?
- What are the philosophical questions that arise from the existence of an ASI and how do they affect our perceptual models of human nature?
- What are the potential effects of ASI on employment, education and the economy?
- How can transparency and accountability in the operation and decision-making of an ASI be ensured?
- What are the timeframes estimated for the emergence of a fully-fledged ASI and what estimates are based on scientific data?
- How can ASI affect human society and its values in the medium and long term?
- What is the role of interdisciplinarity (e.g. philosophy, law, sociology) in the ASI debate?
- What are the main ethical dilemmas in relation to the autonomy and self-consciousness of the ASI?
- How can education in schools be adapted to meet the challenges and opportunities that ASI brings?
- How can people work with ASI to strike a balance between dependency and sustainable development?



Activity 22. Group work. With the help of AI of your choice, write an essay of a maximum of 500 words, in which to develop the topic: "If ASI acquires consciousness, what is man's moral duty towards it?". Evaluation criteria: the consideration of ethical issues, the ability to connect theory with experience, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and clarity of positions.



Activity 23. Group work (elective graded assignment). Create a short PowerPoint presentation presenting a hypothetical scenario generated by the AI of your choice, about the world in a hundred years if ASI achieves complete domination. Then check the text for the accuracy of the information generated by AI. In a Word document, list the prompt you provided, the text generated by AI, and the corrections you made. Evaluation criteria: accuracy of the prompt, creativity, imagination, ability to connect theory with experience, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.

Singularity

Technological Singularity is the theoretical moment in which AI transcends human intelligence and acquires the possibility of autonomous self-improvement. At this point, technological advances become exponential and uncontrollable, leading to dramatic changes in society. The idea is based on the assumption that an AI superintelligence (ASI) will be able to continuously improve itself, creating new, even more sophisticated versions of it. This will lead to a chain of explosive progress, which will exceed people's ability to control or fully understand it. The term was popularized by scientist and futurist Ray Kurzweil, who predicted that Singularity could happen in the 21st century. Singularity could bring either absolute progress or utter destruction – or something in between.

Possible Effects of Singularity

Science and technology will develop at unimaginable speeds.

- Rapid advances in medicine, energy, space exploration and many other sciences.
- Humans can lose control of the evolution of AI.

Automated decision-making

Super-intelligent machines could make critical decisions without human intervention.

- Optimization in governance, economy and crisis management.
- People may lose the ability to control important decisions that affect society.

Loss of Control and Existential Risks

If a super-intelligent AI operates without clear ethical boundaries, it can make unpredictable and potentially dangerous decisions.

- If planned correctly, it could solve humanity's big problems.
- An uncontrollable super-intelligent AI could think of humans as an obstacle or as insignificant.

Changes in the economy and work

Most jobs can be replaced by super-intelligent machines.

- If resources are allocated correctly, humanity could be relieved of the need for work.
- If there is no fair distribution, extreme economic disparities can result.

New era of human existence

If properly controlled, Singularity can usher in a golden age of prosperity, longevity, and technological progress.

- Humanity could integrate AI into its brain (neurotechnology, cybernetic implants) and transcend human limits.
- The concept of human identity can be drastically changed or even lost.



Food for thought. Do you think humanity can control a super-intelligent artificial intelligence?



Ask the AI of your preference to learn more

- What are the basic concepts and theories behind the idea of Singularity?
- What is the role of artificial intelligence in achieving Singularity?
- How likely is it that we will reach Singularity within the next few decades?
- Who are the most important scientists and theorists associated with the study of Singularity?
- How does Singularity affect the concept of human identity and existence?
- What are the potential benefits and risks associated with achieving Singularity?
- How can Singularity affect the global economy and work?
- How is the ethical dimension of this technological development addressed?

- Are there historical precedents or models that can give us clues about the consequences of Singularity?
- What is the attitude of governments, organizations and companies towards the possibility of Singularity?
- What is the difference between technological and cognitive Singularity?
- What role does the evolution of computing power play in the Singularity approach?
- How do societies and cultures respond to a possible future reality defined by Singularity?
- What are the current data and advances that show that we are moving towards Singularity?
- How can educating and preparing people help cope with these changes?
- How does Singularity relate to concepts such as technological "exponentiality" and Moore's Law?
- What is the difference between dystopian and utopian predictions about Singularity?
- How can Singularity influence science, medicine and space exploration?
- Are there alternative theories that question or reject the possibility of Singularity?
- How can a global debate be organized to safeguard humanity and morality on the road to Singularity?



Activity 24. Group work. With the help of the AI of your choice, write an essay of a maximum of 500 words, in which you analyze the topic: "Is Singularity necessary for human progress or an existential threat?". Next, check the text for the accuracy of the information generated by AI. In a Word document, list the prompt you provided, the text generated by AI, and the corrections you made. Evaluation criteria: accuracy of the prompt, the ability to connect theory with experience, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.



Activity 25. Group work (elective graded assignment). Create an infographic (with any application you want), proposing a global plan for managing Singularity, taking into account the political, social and legal dimensions. Evaluation criteria: the originality and aesthetic integrity of the infographic, the ability to link theory with experience, the academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.

Ethical and social issues related to Artificial Intelligence

Ethical and social issues in AI are a critical field of study, as technological advances often transcend norms and social norms. AI has the potential to drastically improve quality of life, but its uptake must be based on ethical pillars and social sensitivity. The conversation around these issues is not just about experts, but about all of us, as AI affects more and more areas of life.

Main ethical dilemmas

- Bias and justice. AI systems can reinforce social inequalities if trained in biased data. Example: Face recognition algorithms with low accuracy in people with dark skin. Recruitment systems that favour specific demographic groups.
- Protection of personal data. The collection and analysis of vast data (e.g., from social media, IoT devices) raises questions about privacy and consent. Example: Using location data for targeted ads without explicit permission.
- Transparency. Many deep learning systems are "black boxes," meaning they don't explain how they made a decision. Example: Rejection of a loan by a Bank without clear justification.
- Responsibility and influence. Who is responsible when an autonomous vehicle causes an accident? The programmer, the user, or the algorithm?
- Autonomy and control. AI automation reduces human control over critical processes (e.g., medical diagnostics, military drones).

Social impact

- Job losses. Automation (e.g., robots in industries, chatbots in customer service) threatens to replace workers in sectors with repetitive tasks. On the other hand, there may be creation of new positions (e.g., data scientists, AI ethicists).
- Digital Divide. Access to AI technologies and their benefits are unequal between countries or societal groups. Example: Companies using AI for premium services, ignoring financially weak teams.
- Social manipulation and information. Algorithms that personalize content (e.g., social media) can create bubbles or promote misinformation. Example: Fake news that exacerbates political polarization.

Psychological effects

- Increasing reliance on technology (e.g., social media algorithms that cause Fear Of Missing Out (FOMO)).

Ethical Principles for AI

To address the above, principles are proposed such as:

- International Law. Regulations such as GDPR in Europe for data protection. EU AI Act (2024): Categorize AI applications by risk (prohibited, high-risk, restricted).
- AI for the common good. Development of systems that promote humanity (e.g., natural disaster prediction, disease diagnosis).
- Transparent design. Systems with explainable algorithms (Explainable AI XAI) and human control discrimination.
- Lifelong learning and retraining. Programs to prepare employees in the era of automation.

Examples of crises

- Cambridge Analytica: Misuse of Facebook user data for political manipulation.
- Amazon Recruitment Tool: Algorithm that discriminates against women due to historical data.
- Deepfakes: Artificially created videos that threaten public trust (e.g., political propaganda).

Challenges ahead

- General AI (AGI): Development of systems with human intelligence and ethical behavior.
- Digital monetary inequality: Cryptocurrencies and AI controlling financial systems.
- Eco-cost: High energy consumption for training AI models (e.g., GPT-4).



Ask the AI of your preference to learn more

- What are the ethical challenges arising from the use of AI in critical decisions such as medical diagnosis or justice?
- How can the integration of bias into AI algorithms be addressed?
- What are the social and ethical risks of the possible autonomy of AI?
- How does the development of AI affect equality of access to rights, information and opportunities?
- What is the role of transparency and accountability in AI management?
- What are the responsibilities of developers and companies that build AI systems?
- How can government and international regulations ensure the ethical use of AI?
- How does AI affect labour relations and the labour market, and how should these impacts be addressed?
- Is there a risk of privacy violations through the use of Artificial Intelligence and how can this be minimized?
- How is "liability" defined when an AI system causes damage or error?
- How does the development of AI systems affect social inequalities?
- What is the ethical basis for training AI systems on data containing information without citizens' consent?
- What impact can the widespread adoption of AI have on human creativity and personal freedom?
- What are the possible consequences if AI is used in military applications or decision-making for wars?
- How can we ensure that AI works for everyone, not just specific social groups or interests?
- What are the institutional and ethical challenges when adopting AI on a global scale?
- What are the implications of the development of AI for the concepts of human identity and self-determination?
- How can a balance be struck between innovation and ethics in the process of AI evolution?
- What measures can be taken to improve public confidence in the use of AI systems?
- What is the importance of educating the public about the possibilities, risks and limits of AI to ensure a broader and more informed societal dialogue on its evolution?



Activity 26. Group work. With the help of AI of your choice, write an essay of a maximum of 500

words, in which to develop the topic: "Who is responsible for an accident caused by an autonomous vehicle, taking into account the technological, ethical and legal dimension of the issue." Next, check the text for the accuracy of the information generated by AI. In a Word document, list the prompt you provided, the text generated by AI, and the corrections you made. Evaluation criteria: accuracy of the prompt, quality of arguments, ability to link theory with experience, academic structure of the text, the use of documented sources, the critical and synthetic way of development and the clarity of positions.



Activity 27. Group work (elective graded assignment). Create a short video (as a commercial) to

inform the public about deepfakes and how to recognize them. Evaluation criteria: originality, the ability to connect theory with experience, critical and synthetic way of development and clarity of positions.



Activity 28. Group work. Create a short PowerPoint presentation presenting the Cambridge Analytica

scandal and identifying the perpetrators and consequences. Evaluation criteria: originality, the ability to connect theory with experience, critical and synthetic way of development, and clarity of positions.



Prompting

Prompting

What is Prompting?

Prompting refers to the process of designing and formulating inputs (prompts) given to AI models (e.g. language models such as GPT) to produce specific, precise or creative outputs. It is the "command" or "question" that instructs the AI to perform a task, such as writing text, answering a question, or creating an image.

How does it work?

AI models are trained on vast amounts of data and learn to predict the most likely continuation of a text. The prompt acts as the trigger that triggers this prediction.

Basic types of prompts

- Simple questions: "What is the capital of Australia?"
- Commands: "Translate the following text into English: [...]"
- Creative prompts: "Write a poem about the sea with 8-syllable verses."

Applications of prompting

- Content production: Articles, poems, social networks.
- Education and problem solving: Mathematics, programming, translation.
- Creative expression: Scripts, musical lyrics, artistic images (e.g. with DALL-E).
- Business applications: Customer responses, data analysis.

Very basic effective prompting strategies

- Clarity and precision: The more specific the goal, the better the output.
Bad: "Tell me about nutrition."
Best: "What are the basic nutritional tips for a vegan athlete?"
Vague prompt: "Write about climate change." General, probably superficial answer.
Specific prompt: "Brief analysis of the impacts of climate change in the Mediterranean over the last decade, with emphasis on biodiversity." More targeted and useful output.
- If the output is not satisfactory, add more details or change the structure.
- Check for bias: If you ask "Write about a leader," the model may suggest mostly men. Add: "Include female leaders."
- Contextual: Helps AI understand context. Example: "As an elementary school teacher, how can I teach addition in a fun way?"
- Use examples: Shows AI the desired style or format. Example: "Write a story with a mystery tone, similar to this: [cite example]."
- Iterative prompting: Improve output through sequential questions. First prompt: "Write an introduction to an AI report." Second prompt: "Make it more concise and add statistics."

Basic principles governing the writing of appropriate prompts for more accurate results;

- Writing appropriate prompts to achieve more accurate results is a process based on a set of fundamental principles. Proper handling of prompts ensures increased accuracy, improved relevance, and control of the quality of responses generated by language models. The basic principles governing this process are formed as follows:
- Precision and clarity: Every exhortation should be clear, specific, and free from ambiguity. Where detailed information is required, the description of the call to action should include the required details. A general or vague formulation leads to answers with reduced precision or relevance. For example, instead of the generalized exhortation "Write about History", the more detailed wording "Write a 500-word analysis of the Greek Revolution of 1821" provides clear direction.
- Content and context: Incorporating the necessary context into the prompt ensures that the language model understands the purpose of the response. By including information such as sources, writing styles, or any subject restrictions, the chances of misunderstandings or unnecessary deviations are reduced.

- Use open-ended questions: Open-ended questions enable the model to produce comprehensive and in-depth answers. Instead of one-word or limiting questions, such as "Is water important?", a question such as "What are the ways in which water affects different aspects of human life?" offers space for analysis.
- Verification and rephrasing: It is critical to evaluate the effect of the original prompt and, if necessary, rephrase it more precisely. Improvements are based on any gaps or ambiguities observed in the responses generated.
- Focus on relevance: When preparing the prompt, unnecessary or complex information that is not related to the user's goal should be avoided. Identifying specific parameters makes it easier for the model to understand what is essential.
- Structure and organization: The use of an easy-to-read and structured format in the wording of the prompt helps the model to better process the request. Prompts distinguished by a clear introduction, main part (with facts or questions) and a conclusion aim to generate concise and relevant answers.

How can we improve our ability to create effective prompting?

The ability to create effective prompting, i.e. the art of appropriately formulating questions or instructions to AI systems (such as language models), is a critical skill in modern times. Its continuous improvement requires targeted practice, analytical thinking and understanding of both the possibilities and limitations of AI technology. Below are the key strategies to ensure that this skill improves.

Above all, setting clear objectives for each request is fundamental. As we type a prompt, it is necessary to determine exactly the desired result. For example, a clear, specific, and structured request has a greater chance of yielding the desired result as opposed to a vague or generalized one. The use of specialized keywords and contextual clarification facilitate the comprehension process.

Second, repetition and feedback are central elements. The process of experimenting with different formulations of prompts and comparing the results produced can illuminate weaknesses or highlight best practices. It is important to adopt a reflective approach, where failures act as a direction for further improvements.

In addition, understanding how language models work enhances the process of creating prompts. Familiarity with algorithms and the principles underlying their operation can provide valuable insight into what triggers or limits them. Similarly, keeping abreast of the latest developments in the field of Artificial Intelligence and analyzing successful prompts from other users can enrich our practices.

Finally, adaptability and flexibility are equally critical. Because AI is constantly evolving, best practices change over time. An effective prompter must be willing to consider new strategies, redefine proven methods, and accept the challenges posed by technological progress.

Common mistakes when creating prompts and how they can be avoided

When creating prompts for language models, such as those used in AI, there are often some common mistakes, which can negatively affect the performance and usability of the results. However, through proper analysis and preventive strategies, these mistakes can largely be avoided. The most common of them are described below, along with suggestions for avoiding them.

- Unclear or incomplete wording. One of the most common mistakes occurs when prompts are vague, overly general, or do not provide sufficient context. When the prompt lacks a clear direction, the model has difficulty understanding the user's intent, resulting in irrelevant or inaccurate responses. Using specific and clear language, as well as providing appropriate context, can ensure that the model aligns with the user's intent. For example, instead of asking "Tell me about space," you might phrase "Give a review of space exploration during the 20th century."
- Too long prompts. Although detail is important, extremely long prompts can confuse the model. By overloading information, its ability to recognize what is most critical is reduced. Focus on essential

elements and avoid unnecessary details. Try breaking complex prompts into shorter and more targeted sequential steps.

- Overly demanding or complicated questions. Some prompts can be so complex or involve so many parts that they make it difficult for the model to structure a coherent response. Divide a complex question into smaller, distinct sub-questions to make it easier to understand and produce more organized answers.
- Skip specific instructions. Another common issue is the failure to provide specific instructions on the form or style of the response. The result can be to produce responses that do not meet expectations. Be sure to clearly define the requested tone, format, or depth of the response. For example, if you want an academic style, clarify it.
- Unrealistic expectations from the model. Many users expect "perfect" or overly specialized answers, without taking into account the limitations of the model. This leads to both frustrations and a wrong evaluation of the generated responses. Understand the capabilities and limitations of the model you are using, and design prompts that are realistic.
- Lack of tests and updates. A one-time attempt to create a prompt without rechecking often fails to yield the desired result. Test and optimize your prompt repeatedly. Analyze the results produced and adjust your wording to better align with your goals.

Challenges and limitations

- Sensitivity in wording: Small changes to the prompt can drastically change the output. Example: "Compare ChatGPT to Bard" vs. "Analyze the advantages of ChatGPT over Bard."
- Potential bias: Models reflect the data they were trained on, including biases.
- Difficulty in abstract tasks: For example, the creation of original philosophical analysis.
- Training data addiction: The model doesn't "know" anything except what she's seen in training data.
- Inability to truly understand: AI does not understand the meaning of the text, it merely simulates knowledge.

More about prompting

Language models (e.g., GPT, Bard) are neural networks trained in huge text datasets. When they receive a prompt, they don't "understand" like humans, but predict the next word/space based on the patterns they've learned. Text is divided into small units (tokens), such as words or parts of words. For example, the phrase "Hello!" → ["Hello", "your", "!"]. For each token, the model calculates the probability of the next token. If the prompt is "The yellow...", the model may suggest "bicycle" (high probability) or "sun" (medium probability). The prompt acts as a framework that limits or extends the model's predictions.

context setting

Prompt: "In a distant galaxy..." → The model focuses on science fiction.

Output: "... There was a civilization that traveled in stellar ships."

Prompt: "According to the theory of relativity..." → The model produces scientific text.

Enable specific knowledge

Models access information from their training data. The prompt activates relevant knowledge:

Prompt: "When did the Revolution of 1821 take place?" Activates historical data for Greece.

Prompt: "How is tzatziki made?" Activates recipes from culinary texts.

Advanced prompting techniques

- Few-shot learning. Give the model examples before the requested task so that it learns the pattern. Example: Problem: $2 + 2 = 4$, Problem: $5 + 3 = 8$, Problem: $7 + 2 =$; The model will answer "9".
- Chain-of-thought (CoT) prompting. You ask the AI to explain its thinking step-by-step, improving accuracy in complex tasks. Prompt: "If John has 5 apples and gives 2 to Maria, how many are left? He responded by explaining each step." Exodus: "1. First, John has 5 apples. 2. Gives 2 to Mary: $5 - 2 = 3$. 3. He has 3 apples left."
- Differentiated prompts for different results. Creative: "Write a novel about a man traveling into the future." Analytical: "Analyze the risks of artificial intelligence in the labor market."

Parameters affecting output

Some settings change the way the model processes prompts:

- Tone and style: Tone is the emotional or mental attitude of the text (e.g., formal, relaxed, scientific, humorous). Style is about structure and language choices (e.g., simple sentences, technical language, poetic narration). If you want professional text, use words like "official", "academic". If you want creativity, ask for "fantastic style" or "like a fairy tale". Use comparative examples, such as, "Write like Kazantzakis" or "Imitate the style of a science blog." Check for inconsistency: If you give the prompt "Write a humorous analysis of world hunger.", the tone and topic collide. It would be best to give: "Write a sensitive analysis of world hunger with suggestions for improvement."

Some parameters affect tone and style

Temperature: Low (e.g., 0.2): More stable tone, less creative. High (e.g., 1.0): More active tone, with more imagination.

Max Tokens: Limit length for concise style (e.g., "To 200 words").

Examples

Official tone: "Write an analysis of Greece's economy in academic language."

Relaxed tone: "Tell me about the Parthenon in simple sentences, like talking to a friend."

Persuasive tone: "Write a text that promotes recycling with arguments and statistics."

Academic style: "Compare ancient Greek democracy with modern democracy, using scientific sources."

Creative style: "Write a short story with metaphors and dramatic style about a trip to space."

List style: "List 5 tips for saving energy in bullet points."

Examples of answers

"He explained photosynthesis."

Official tone → "Photosynthesis is a biochemical process where..."

Humorous tone → "Imagine plants being little sunflowers eating light and spitting out oxygen..."

"Describe the life of Marie Curie."

→ Marie Curie was born in 1867 in Poland. She was a woman who changed the history of science..."

Structured style → "Name: Marie Curie, Birth: 1867, Achievements: Nobel Prize in Physics (1903), Discovery of radium..."

"Write an email to a late payer. Tone: Indulgent but professional. Style: Short, with bullet points for next actions. Use polite language without threats."

Output:

Dear [Name],

We hope you are well. We noticed that payment for invoice [#123] expires on [date].

Please:

Complete payment by [new date].

Contact us for any delay.

Thank you for your cooperation.

Friendly

[Full Name]

- **Agent:** Agent refers to the "personality" or "role" you assign the AI to impersonate to produce output. It is a technique that helps the model focus on specific knowledge, style, or purpose. The advantages of using an agent are that it activates specific knowledge or styles of AI (e.g., scientific vs. artistic), Improves the accuracy and consistency of output AND It gives context to AI to understand the context of the work.

Examples of agents

Expert: "Act as a nutrition expert and write a diet plan for diabetics."

Historian: "Imagine you're a 19th century historian. Describe the Industrial Revolution."

Creative Writer: "Be a novelist and write the beginning of a thriller."

- **Creativity:** Creativity refers to the ability of AI to produce innovative, unpredictable or artistic outputs. It depends on The flexibility of the model to combine ideas and parameters that regulate creativity (eg, temperature).

Techniques for creativity

Open prompts: "Invent a myth about a hero who travels through a world made of music."

Use of metaphors: "Write a poem where the sea symbolizes freedom."

Combination of contradictory ideas: "He created a story about a scientist who discovers a city inside a common tomato."

- **Combining agent and creativity:** The agent sets the framework and goal, while creativity adds approach and innovation.

Examples

Agent as creative coach: "Act as an award-winning fantasy writer. Write a scene where a robot discovers emotions. He used poetic metaphors and unexpected elements."

Agent: Award-winning fantasy writer → Defines style and experience.

Creativity: Poetry + unexpected elements → Guides creativity.

Agent for specialized creativity: "Be an architect of the future. He designed a city on a giant bush. Describe the buildings, energy and life of the inhabitants."

Agent: Architect → Imparts technical knowledge.

Creativity: City on a bush → It provokes original thinking.

Scientific creativity: "Act as a biologist investigating extraterrestrial life forms. Describe a creature with biological reptiles and plant characteristics. He used scientific terminology but also creative details."

Artistic creativity: "Be a Renaissance painter. Describe a painting depicting the collision of technology and nature. He used vivid colors and symbolism."

Practical tips for combining agent + creativity

Clearly define the role: Evil: "Write a story about a hero." Best: "Act as a horror writer and write a scene where the hero faces an invisible enemy."

Add restrictions for creativity: "Only use references to nature as metaphors."

Experiment with parameters: Temperature: Increase it (~0.8-1.0) for more creative outputs.

Max Tokens: Limit length for conciseness or increase it for detail.

Conclusion

Prompting is a skill that combines an understanding of AI's capabilities, creativity, and technical precision. Its effectiveness depends on:

- The user's ability to formulate clear and structured questions.
- Understanding the limitations and capabilities of the model.



Practical tip: Start with simple prompts and experiment by gradually improving them. Use tools like ChatGPT or MidJourney to see how different prompts affect results.



Activity 29. Group work. Create an infographic (with whichever app you want) that explains what prompting is. The infographic should include the definition, examples of prompts and its applications. Evaluation criteria: clarity and precision in definition, aesthetic, visual layout and creativity and the use of examples that highlight the content.



Activity 30. Group work (elective graded assignment). Create a short video describing what prompting is. The video may include examples of dialogues with AI systems or educational prompts. Evaluation criteria: clarity in explaining and presenting the concept, creativity, aesthetics and originality.



Artificial Intelligence Tools

Chatbots and Great Language Models



The list is indicative. Due to developments, AI of interest is constantly emerging.

Free options

ChatGPT (Free Tier) <https://chatgpt.com/>

Advantages:

- Free access to GPT-3.5
- User-friendly interface
- Wide range of skills
- Supports multiple languages

Disadvantages:

- Restrictions on frequency of use
- Older model compared to GPT-4
- Limited access to new features
- Occasional availability issues due to high demand

DeepSeek (Free Tier) <https://www.deepseek.com/>

Advantages:

- Free access to advanced open source models
- Excellent coding skills
- Multi-language support
- It is growing rapidly with new possibilities

Disadvantages:

- Smaller community than more established LLMs
- Less user-friendly interface
- Intermittent reliability issues
- Fewer multimodal capabilities compared to GPT-4o or Claude

Bing AI-CoPilot (Microsoft) <https://copilot.microsoft.com/>

Advantages:

- Free access to GPT-4-based technology
- Built-in web search
- Create images with DALL-E
- Built-in Edge browser

Disadvantages:

- Requires a Microsoft account
- Limited number of conversations per day
- Less flexible than standalone LLMs
- Sometimes it provides misleading information from the internet

Google Gemini (Free Tier) <https://gemini.google.com/>

Advantages:

- Free access to Gemini Pro
- Built-in Google search
- Good image comprehension skills
- Continuous improvements from Google

Disadvantages:

- More limited features than premium version
- Sometimes less expensive than competing models
- Requires Google account
- Restrictions on editing certain types of content

Hugging Face (Open Models) <https://huggingface.co/>

Advantages:

- Access to hundreds of open source models
- Ability to run certain models locally
- Transparency in development and operation
- Strong developer community

Disadvantages:

- Most models are less powerful than commercial alternatives
- Requires more technical knowledge
- Unstable performance between different models
- Often less user-friendly environments

Llama 2 (Meta AI) not yet available in Greece <https://www.meta.ai/>

Advantages:

- High-quality open model
- Free for personal and commercial use
- Ability to run locally
- Regular updates from Meta

Disadvantages:

- Requires significant computational resources to run locally
- It lags behind top proprietary models
- Requires technical knowledge for setup and optimization
- Limited support for non-English languages

Subscription Options

ChatGPT Plus (OpenAI)

Advantages:

- Access to GPT-4o and advanced models
- Priority at peak times
- Plugins and tools (search, DALL-E, code analyzers, etc.)
- Unlimited conversations with a larger message limit

Disadvantages:

- Monthly cost (\$20/month)
- Limitations on the number of GPT-4 messages
- Requires an internet connection
- Occasional outages

Claude (Anthropic)

Advantages:

- Excellent in understanding context and natural language
- Advanced versions Claude 3 (Haiku, Sonnet, Opus)
- Ability to edit long texts
- Powerful ability to edit images

Disadvantages:

- High cost for top versions
- Limited availability in some countries
- Fewer tools and plugins than ChatGPT
- Limited adaptability compared to other solutions

Google Gemini Advanced

Advantages:

- Access to Gemini Ultra 1.0
- Integration with Google services (Docs, Gmail etc.)
- Excellent skills in complex problems
- Included with Google One AI Premium subscription

Disadvantages:

- High cost (\$19.99/month)
- Less mature ecosystem than ChatGPT
- Limited availability in some regions
- Some restrictions on editing content

Perplexity AI Pro

Advantages:

- Focus on search with referrals
- Access to Claude Opus and GPT-4
- Unlimited searches and conversations
- Excellent for research work

Disadvantages:

- Cost (\$20/month)
- Less flexible for creative tasks
- Limited content production capabilities
- Smaller ecosystem than main platforms

Copilot Pro (Microsoft)

Advantages:

- Built-in Windows and Microsoft apps
- Advanced programming features
- Improved productivity in Office
- Consistent performance and reliability

Disadvantages:

- Cost (\$20/month)
- Restricted outside the Microsoft ecosystem
- Requires Windows 11 for some features
- Less flexible than standalone LLMs

Artificial Intelligence tools for creating images from text



The list is indicative. Due to developments, AI of interest is constantly emerging.

Free tools

Name	Description	Advantages	Disadvantages	Hyperlink
Microsoft Designer	Create images from text with AI.	Easy to use, fast, accurate and flexible.	Limited advanced editing features.	Microsoft Designer
Canva	AI-powered image maker app.	Easy to use, integration with other design functions.	Some features may require a subscription.	Canva
Pixlr	Online photo editor with AI functions.	User-friendly, basic image editing and creation functions.	Some advanced features require a subscription.	Pixlr
Melobytes	Create images from text with AI.	Simple and instant creation of images from text.	Limited customization and style options.	Melobytes
DeepAI Text to Image	Convert text to image with AI.	Easy to use, fast response.	Image quality may vary.	DeepAI
Artbreeder	Create and explore images with AI.	Great community, variety of styles.	Limited features without subscription.	Artbreeder
NightCafe	Create art with AI from text.	Multiple styles and options.	Limited daily creations without subscription.	NightCafe
StarryAI	Turn text into art with AI.	Easy to use, high-quality results.	Limited free creations per day.	StarryAI
DALL· E Mini	Open source model for creating images from text.	Free access, easy to use.	Image quality may be lower than professional tools.	DALL· E Mini
Stable Diffusion	Open source AI-powered image creation model.	Flexible, supports custom settings.	It requires technical knowledge to install and use.	Stable Diffusion
Leonardo.Ai	Realistic and artistic images.	Customizable models, free credits.	Requires registration, slow processing.	Leonardo.Ai
Craiyon	Simple tool for quick creation.	No registration, lots of style options.	Lower image quality.	Craiyon
Artbreeder	Combine images based on ML.	Creation of synthetic personals.	Limited free tier, requires account.	Artbreeder
Fotor AI Image Generator	It focuses on photorealistic images.	Easy to use, templates.	Watermarks, limited creativity.	Fotor

Subscription tools

Name	Description	Advantages	Disadvantages	Hyperlink
Shutterstock AI Image Generator	Create AI-powered images based on text descriptions.	Access to millions of images, advanced creation tools.	Requires subscription for full access.	Shutterstock
Adobe Firefly	Online image creation with AI, conversion of text into high-quality images.	Integration with other Adobe tools, advanced editing features.	Requires subscription for full access.	Adobe Firefly

Midjourney	Create high-quality images from text via Discord.	Excellent image quality, variety of styles.	Requires subscription, use via Discord.	Midjourney
Deep Dream Generator	Create dream images with AI.	Easy to use, unique effects.	Limited features without subscription.	Deep Dream Generator
Runway ML	AI-powered image and video creation and editing platform.	Multiple tools, built-in		Runway ML
DALL-E 3 (ChatGPT Plus)	Advanced version with GPT-4.	Superior resolution, creation through discussion.	Requires subscription (~\$20/month).	DALL-E 3
Jasper Art	It focuses on commercial content.	Quick creation, templates for ads.	Expensive (~\$49/month), limited style.	Jasper Art
ArtStation AI	Specialized for artists.	High technical quality, subscription assets.	Requires ArtStation Pro (~\$9.95/mo).	ArtStation
Generate.photos	Creation of photorealistic faces.	Unique persons without legal issues.	Limited creativity, ~\$25/month.	Generate.photos
Designs.ai	Tool for branding and marketing.	Integrated toolkit, commercial templates.	Expensive (~\$29/month), limited customization.	Designs.ai
Picsart AI Image Generator	It focuses on social media content.	Mobile-friendly, access to filters.	Basic features, ~\$12/month.	Picsart

Artificial Intelligence tools for creating videos from text



The list is indicative. Due to developments, AI of interest is constantly emerging.

Free tools

Name	Description	Advantages	Disadvantages	Hyperlink
Pollo AI	Multi-model hub (text/image/video effects).	Access to Runway/Kling/Luma models; upscaling/editing tools.	Complex interface; outputs require refinement 20 credits/day, multi-model access.	Pollo AI
Kling AI	Cinematic video generator with camera controls.	Film-grade motion; lip-sync; scene extension tools. Free credits, 1080p, 2-min clips.	Slow generation (hours); unreliable free tier.	Kling AI
Animaker AI	Animated explainer videos with auto-lip sync.	2000+ voiceovers; character customization; collaboration tools.	Watermark; no download in free plan.	Animaker AI
Canva Magic Media	Text-to-video + avatars within design platform.	Talking head avatars; seamless design integration; templates.	Credits deplete fast; simplistic outputs 50 free credits.	Canva Magic Media
Pictory	Converts blogs/scripts to short videos.	Auto-captions; intuitive editor; SEO-optimized outputs.	Watermarked; lacks advanced editing 3 videos/month.	Pictory
Alibaba Qwen	Text-to-video with unlimited free generations.	Surprisingly high quality; no signup required Unlimited free credits, no watermark.	Unstable servers; frequent generation failures.	Alibaba Qwen
InVideo AI	A cloud-based platform that uses AI to quickly generate videos from text prompts, offering AI-generated visuals, scripts, and realistic voiceovers.	Very user-friendly, great for beginners. Generates videos from text prompts quickly. Offers AI-generated visuals, scripts, and realistic voiceovers in multiple languages. Web-based, no software download needed. Good for marketing, explainer, and promo videos.	Free plan has limitations on video length (e.g., 10 minutes per week) and exports (e.g., 4 exports with watermark). Editing flexibility can be limited for highly customized content. Can be slow compared to some other tools.	InVideo AI

RunwayML	An innovative AI-powered platform for creatives, offering advanced tools for video and image production, including text-to-video generation and sophisticated image manipulation.	Known for hyperrealistic video generation. Offers various generative AI features for creative control. Strong for short-form storytelling and experimental visuals.	Free plan typically offers limited one-time credits. Watermarks on free exports. Can be more complex for absolute beginners compared to simpler text-to-video tools.	RunwayML
Vidu AI	A powerful AI creation tool that converts text and images into dynamic videos with impressive speed, featuring "Reference to Video," "Image to Video," and "Text to Video" options.	Intuitive web-based interface. Offers "Reference to Video," "Image to Video," and "Text to Video" options. Ultra-fast video generation (reportedly within 10 seconds). Provides free monthly credits to users. Good for animation and bulk video creation.	Requires a stable internet connection. May have limitations on video quality for free users.	Vidu AI
HeyGen	Specializes in creating AI-driven avatar videos (talking heads) from text, offering a selection of realistic avatars and voices, with features like video translation.	Excellent for creating AI-driven avatar videos (talking heads). Offers a good selection of realistic avatars and voices. Features like video translation and easy custom avatar creation. Good for content creators expanding into new markets.	Free plan has significant limitations on video length and features. Older avatars might not look as good as newer ones. Can be a bit "bloated" with many features, potentially overwhelming for some.	HeyGen
Fotor (AI Video Generator)	An AI-powered tool that converts text prompts or still images into short video clips, offering various animation styles and automatic video quality enhancements.	Offers AI animation styles (anime, digital art, etc.) and realistic styles. Can generate short video clips from text or images. No watermark on free exports. Provides AI video editing with text commands. Mobile apps available for iOS and Android.	Free video length is often short (e.g., 4-8 seconds). May not offer the same level of complex video editing as dedicated video editors.	Fotor AI Video Generator
Vmaker AI	An AI-powered video editing platform designed	Focuses on transforming raw video	Primarily an AI video editor	Vmaker AI

	to transform raw video footage into polished, professional content, automating tasks like auto-captioning, background removal, and b-roll insertion.	footage into publish-ready videos. Offers AI-powered editing features like background removal, auto-subtitles, and b-roll insertion. Can convert long-form videos into short-form content. Claims to be free without a watermark on exports.	rather than a pure generative AI from scratch (though it has some generative capabilities). May require existing footage to truly leverage its strengths.	
Clipfly	An online video editor with an integrated AI video generator that can turn text prompts into videos, offering a simple drag-and-drop interface and various styles.	Simple drag-and-drop interface for video editing. Includes an AI video generator to turn text prompts into videos. Claims to export videos in up to 4K resolution with no watermarks. Good for quick, branded videos for marketing, education, and social media.	The AI video generation might be simpler compared to more advanced tools. May have limitations on stock assets for free users.	Clipfly
Synthesia	A leading AI video generation platform that allows users to create videos with realistic AI avatars and voiceovers from text, simplifying video creation for corporate and educational content.	Leading AI video generator for creating videos with AI avatars. Strong for training videos and corporate communications. Offers text-to-speech in many languages and voice cloning. Highly secure platform.	Free plan is often a limited trial or specific credits, not a perpetually free tier for extensive use. Can be quite expensive for full features. Customer support responsiveness can vary.	Synthesia
Pika Labs	An innovative AI-powered video generation model designed for creative storytelling, focusing on stylized and cinematic output, with capabilities to generate and edit videos from text or images.	Known for generating marketing and product showcase videos. Often offers free monthly credits.	Free credits can run out quickly with advanced features. Visuals can sometimes feel generic.	Pika Labs
Renderforest (AI Video Generator)	A versatile online platform that includes an AI video generator to turn ideas into videos from a simple prompt, offering both animated and realistic AI video styles, and	Turns ideas into videos by typing a prompt. Offers animated or realistic AI video styles. Suggests music and voiceovers. Easy to use for non-technical users.	Free plan likely has limitations on export quality, length, or features. May require a paid subscription for	Renderforest AI Video Generator

	suggesting music and voiceovers.		more advanced customization and commercial use.	
Lumen5	Turns blog/text into video easily. Free plan available Social media formats.	Branding on free videos Basic visuals without paid plan.	Social-media-friendly video maker that converts text to video using templates.	lumen5.com
Kapwing	Easy editing tools. Auto-subtitling. Collaboration features.	Watermark on free plan. Limited exports/month.	All-in-one online video editor with some AI tools like smart cut and subtitles.	kapwing.com
Animoto	Drag-and-drop builder. Music library included. Free version available.	Limited templates. Watermark on free plan.	Slideshow-style video creator with drag-and-drop interface and simple customization.	animoto.com
Steve.AI	Converts blog/text into animated or live videos. Intuitive UI	Watermark on free videos. Avatar voice options limited.	Makes animated explainer or live video clips from scripts using AI.	steve.ai
Colossyan	Lifelike avatars for explainer videos. Easy script input. Multi-language support.	Free version has limited characters. Watermark present.	AI presenter tool using avatars to generate business-style explainer videos.	colossyan.com
FlexClip	Simple editor. Templates and stock media. Free export (with watermark).	Basic AI features. Limited features compared to others.	Template-based online video editor with beginner-friendly tools and basic AI.	flexclip.com

Subscription tools

Name	Description	Advantages	Disadvantages	Hyperlink
Synthesia	Video creation tool with AI avatars, supporting 120+ languages.	Great for educational and promotional videos.	Requires subscription for full access.	Synthesia
HeyGen	Create professional videos with AI genetics, offering over 100 avatars.	Variety of avatar options, high video quality.	Requires subscription.	HeyGen
Wondershare Filmora	Video editing tool with AI features for business.	Rich	Requires subscription.	Wondershare Filmora

Pictory	Tool that converts text to video, ideal for creating presentations and marketing content.	Easy to use, quickly convert text to video.	Requires subscription for full access.	Pictory
Lumen5	Platform that creates videos from articles and blog posts, using AI to automatically select scenes and music.	Automated process, large media library.	Limited customization features in the basic version.	Lumen5
Animoto	Video creation tool with ready-made templates and the ability to add text, images and music.	User-friendly, fast video creation.	Limited advanced features without subscription.	Animoto
Magisto	An app that uses AI to automatically edit videos, generating professional results from simple shots.	Quickly edit, choose styles and music.	Requires subscription to access all features.	Magisto
Veed.io	Online video editing platform with AI tools for automatic subtitle generation and text-to-speech.	Easy to use interface, multi-language support.	Limited features in the free version.	Veed.io
Descript	Video and audio editing tool with transcription, text editing, and AI-powered voice generation capabilities.	Integrated platform, user-friendly.	Requires subscription for full functionality.	Descript
Wibbitz	Platform for creating short video news and marketing content, using AI to automatically select media.	Fast production, professional standards.	Limited customization options without subscription.	Wibbitz
Rocketium	Video maker for marketing teams with AI-powered automation and customization.	Collaborative environment, integration with other platforms.	Requires subscription to access all features.	Rocketium
Moovly	Online video creation platform with rich media library and AI tools for automatic content creation.	Versatile, it supports many video formats.	Limited features in the free version.	Moovly
Vyond	Animated video maker with ready-made templates and characters, ideal for educational and professional videos.	Variety of styles, easy customization.	Requires subscription for full access.	Vyond

Free tier realities:

Most "free" tools impose watermarks, credit limits, or output caps. Exceptions include Alibaba Qwen (unlimited credits) and Pollo AI (daily credits).

Specialization matters:

Marketing. Synthesia/Pictory for avatar/blog-based videos.

Social media. Lumen5/InVideo for quick templated clips.
Cinematic. Kling/Runway for film-style motion control.

Hidden gems: Alibaba Qwen offers unlimited free video generation despite corporate backing, though reliability is spotty.

Pollo AI aggregates top models (Runway/Kling) in one free tier.

Avoid for Complex Projects: Free tiers lack features like lip-sync (except Kling), 4K export, or scene consistency tools.



Tip: For experimentation, start with Pollo AI (multi-model access) or Alibaba Qwen (no credit limits).

For professional use, Runway's free credits offer the best creative control. Always check licensing for commercial use.

Artificial Intelligence tools for creating music and songs from text



The list is indicative. Due to developments, AI of interest is constantly emerging.

Free tools

Name	Description	Advantages	Disadvantages	Hyperlink
MusicAI	App that creates new music with artificial intelligence.	Easy to use, fast music creation.	Limited customization options.	MusicAI
AIMUSIC	Platform that allows the creation of up to 300 songs monthly for free.	Large number of free creations.	Limited advanced features without subscription.	AIMUSIC
Jukebox AI	OpenAI's tool that creates high-fidelity music.	Create music in various styles and genres.	It requires technical knowledge for full utilization.	Jukebox AI
Riffusion	Music generator that allows creating music from text.	Instantly create music from text.	Compositions may not have the depth of music created by people.	Riffusion
MusyCraft	Application that combines artificial intelligence with the user's musical vision.	Combining AI with user creativity.	It requires basic knowledge of music.	MusyCraft
Boomy	Platform that simplifies the process of creating music with artificial intelligence.	Large library of public tracks and playlists.	Limited advanced features without subscription.	Boomy
Pack Generator	Tool that creates free packages of music samples based on written orders.	Create custom samples.	It requires knowledge of music production for full utilization.	Pack Generator
Suno AI	App that creates original songs in minutes.	Quickly create songs on demand.	Limited customization options.	Suno AI
Musicfy	Online music track maker for beginners.	Beginner-friendly, easy to use.	Limited advanced features.	Musicfy
Melobytes	App that generates random songs based on lyrics and music style.	Adjust music based on lyrics.	Limited options for professional use.	Melobytes
Magenta Studio	Open source library from Google, based on TensorFlow.	Free, customization via code, combined with DAWs.	It requires technical knowledge, limited pre-parameterized models.	magenta.tensorflow.org
BandLab (SongStarter)	AI-powered platform for creating song ideas.	Simple UI, collaboration capability, free export.	Limited variety of styles, basic beats.	bandlab.com

Soundtrap	Free AI-powered DAW for automated music and loops.	Built-in samples, real-time collaboration.	Free version with limited slots storage.	soundtrap.com
AIVA	AI for classical and electronic music.	Professional quality, free for non-commercial use.	It does not allow MIDI editing in the free version.	aiva.ai
Ecret Music	Create royalty-free music with scene/emotion selection.	Customizable styles, fast export.	Limited creativity, repetitive patterns.	ecrettmusic.com
MuseNet (OpenAI)	Creation of music in various genres (e.g. classical, jazz).	High variety of styles, the ability to combine instruments.	Access via API only, no GUI for beginners.	openai.com/research/musenet
SoundBow	Create music with AI and visual interface.	Intuitive for visual learners, free for basic use.	Limited export, for experimentation only.	soundbow.net

Subscription tools

Name	Description	Advantages	Disadvantages	Hyperlink
Amper Music (Soundful)	AI to produce music with professional results.	High quality, rights for commercial use.	Expensive (from \$29/month), limited free trial.	soundful.com
LANDR	Automatic mastering and music creation with AI.	Professional mastering, integration with DAWs.	Subscription from \$12/month, limited control for users.	landr.com
Output (Arcade)	AI-powered library of samples and loops.	Quality sound packages, combined with DAWs.	Expensive (\$20/month), requires subscription for full access.	output.com
Splice	Platform for samples, loops and AI-based tools.	Vast library, rent-to-own plugins.	Moderate AI customization, key features.	splice.com
IBM Watson Beat	Experimental tool for music based on emotions.	Unique style, based on emotional analysis.	Limited documentation, requires technical knowledge.	developer.ibm.com
Boomy	AI to create songs in minutes.	Fast production, ability to sell music.	Mediocre quality, limited processing.	boomy.com
Soundraw	Create AI-powered music for videos/games.	Customizable length and structure, commercial license.	Monthly fee (\$17), limited style.	soundraw.io
Mubert	AI to create real-time music streams.	Endless production, perfect for streamers.	High cost (\$14/month), repeating patterns.	mubert.com
Endel	Personalized music based on biometric data.	Scientifically substantiated, adaptation to activities.	Expensive (\$10/month), ambient music only.	endel.io
Orb Producer Suite	AI plugin for DAWs (compositions, melodies).	Professional results, integration with FL Studio/Cubase.	Expensive (from \$199), requires DAW knowledge.	orbplugins.com

Artificial Intelligence Tools to Create Deepfakes



The list is indicative. Due to developments, AI of interest is constantly emerging.

Free tools

Name	Description	Advantages	Disadvantages	Hyperlink
DeepFaceLab	Open source tool for advanced deepfakes (video/images).	High customization, free for all functions.	Requires technical knowledge (Python, GPU).	GitHub
FaceSwap	Open source platform for face-to-video sharing.	Flexible, good documentation.	Difficult for beginners, requires powerful hardware.	faceswap.dev
Zao	Mobile app with AI sharing faces in videos/ GIFs.	Simple UI, fast results.	Limited video length, privacy concerns.	zao.ai
Reface	Application for exchanging faces in videos / memes.	Easy to use, large library of templates.	Watermarks in free version, restrictions in HD.	reface.ai
DeepArt	Tool for transferring face to images/art.	Simple for photos, free basic filters.	Time-consuming, high quality subscription only.	deepart.io

Subscription tools

Name	Description	Advantages	Disadvantages	Hyperlink
MyHeritage Deep Nostalgia	Restore life to old photos with animated faces.	Accurate face detection, easy to use.	Pay for HD/video, limited creativity.	myheritage.com
Synthesia	Platform for deepfake videos with AI avatars.	Professional results, multi-language support.	Expensive (from \$30/month), limited customization.	synthesia.io
D-ID	Tool for realistic talking avatars (video with voice).	High realism, API for developers.	Pricing per minute (from \$0.08/minute).	d-id.com
Wombo (Dream by Wombo)	Create deepfake songs/animations.	Creative, fun interface.	Watermarks, premium for HD.	wombo.ai
Avatarify	Add-on for live deepfakes on platforms (e.g. Zoom).	Real time animation, easy installation.	Requires technical setup, limited support.	github.com/alievk/avatarify



Educational uses of Artificial Intelligence

Basic applications of Artificial Intelligence in the educational process

AI has now become a powerful technology that transforms the educational process, offering tools and methods that enhance learning, personalize teaching and improve the management of education systems. Through specific applications, AI has the potential to positively influence the way students learn and teachers teach. Here are ten detailed applications and scenarios for the use of AI in the educational process.

The first application concerns the personalized adaptation of content and teaching. AI programs, such as smart teaching systems, are able to analyze each student's individual needs, capabilities, and learning rates, offering personalized learning pathways. One example is the use of platforms such as DreamBox or Squirrel AI, which dynamically adapt educational content to a student's abilities, allowing them to progress at a pace that is right for them.

Second, AI can be harnessed to detect learning disabilities or deficiencies. By analyzing data from online tests or exercises, AI systems can identify areas where students struggle or do not achieve adequate understanding. For example, a student struggling with geometry can quickly be identified by the platform, and the software can suggest personalized exercises or additional guidance.

A third use is to automate evaluation and feedback. AI systems are capable of correcting multiple-choice tests, written texts, and even providing detailed assessments of language structure or use. Tools like Grammarly or Turnitin help teachers reduce assessment time and focus more on providing personal support to students.

The fourth application focuses on virtual conversations using AI chatbots. Students can ask questions and receive answers in real time, without the need for physical presence of the teacher. One example is the ChatGPT system, which can provide information, solve exercises, or help understand difficult concepts.

An additional application concerns the improvement of students' creativity. Through the use of AI tools, such as content creation systems, students can create presentations, artwork, music or even scientific simulations. This technology promotes initiative and innovation, making students more active participants in the educational process.

AI can also be used to analyze data from the entire educational community. Machine learning analytics tools help predict student progress, identify areas of failure, or even identify students who are likely to drop out of school so preventive measures can be taken.

Another area of application concerns the integration of AI into online learning programs. Platforms like Coursera and Khan Academy use AI algorithms to suggest lessons, content, or videos based on users' previous preferences, thus facilitating self-directed learning.

Another way to use AI is to promote accessibility. AI can provide solutions for students with disabilities, such as automatic voice-to-text translation, subtitles or even audio synthesis for the visually impaired. For example, tools like Microsoft Immersive Reader improve accessibility to digital teaching.

Also, AI can be used to enhance the culture of continuous learning in teachers. AI tools can leverage classroom data to offer teachers feedback and suggestions for teaching improvements, enhancing their professional training.

Finally, AI can make a decisive contribution to the design of intelligent learning spaces. Schools and universities can incorporate technologies that enable dynamic pattern recognition in interactions between students and teachers, optimizing learning within physical or online spaces.



Activity 31. Group work (elective graded assignment). Create an infographic (with any application you want) that summarizes the key applications of AI in education, as described in the text. The infographic

should include examples from global educational practice, visualizing concepts through images, graphics and diagrams. Evaluation criteria: completeness and clarity of content, creativity, aesthetics and originality.

The contribution of Artificial Intelligence to the personalization of learning

AI helps personalize learning and develop adaptive learning experiences. Using technologies such as machine learning algorithms, data analytics and intelligent educational platforms, AI adapts the educational process to the needs, capabilities and paces of each learner, supporting the creation of a diverse and flexible learning model.

Nowadays, students do not form a homogeneous population with common needs or abilities. Each student learns at a different speed, uses unique strategies, and prefers a variety of ways of ingesting information. Artificial intelligence facilitates the understanding of these distinct characteristics through the analysis of large amounts of data derived from educational activity. Specifically, it can record and evaluate students' performance, skills and deficiencies in real time, providing an accurate picture of their progress. As a result, AI-based education systems can adapt teaching methods, content and activities according to the specific needs of the learner.

A typical example of this functionality is adaptive learning software, which offers personalized material depending on the level of knowledge and learning progress of the user. These tools can adapt the course of instruction by changing the difficulty of the exercises, incorporating repetitions on topics where weaknesses are identified, or providing new challenges when the student exceeds the expected level. In addition, the element of direct feedback offered by artificial intelligence enhances the effectiveness of learning processes. Students can receive corrections and suggestions in real time, correcting their mistakes and enhancing their understanding.

In addition, AI contributes to enhancing the autonomy of the learner by empowering him as an active participant in their learning path. The traditional one-size-fits-all approach that has characterised the education system for decades is receding in the face of the potential offered by personalising learning through AI. The student gains access to personalized study guides, adjusts their learning pace and follows a personal learning path, which brings them closer to their aspirations and abilities.

In addition, AI is an important partner of teachers. While digital platforms adapt learning data to students, teachers are freeing themselves from repetitive and time-consuming administrative functions, devoting more time to personal guidance. In addition, platforms that collect and analyze data can provide teachers with insights into educational trends, weaknesses or classroom strengths, enhancing their pedagogical practices.

AI applications don't stop at providing personalized content or analyzing data. The development of intelligent virtual assistants, such as chatbots or digital mentors, allows students to access ongoing support at all times. Through these technologies, the student's self-confidence and involvement in the educational process are enhanced, while at the same time a constantly evolving dialogue of knowledge is promoted.

However, while the potential of AI to personalise learning is undeniable, it raises significant ethical and societal challenges. Protecting user data privacy, avoiding bias in algorithms and equal access to these technologies are critical factors that need to be addressed in order to ensure their fair and effective implementation.

To sum up, AI is effectively transforming the education sector, creating conditions for quality and personalized learning. By adapting the content to the needs of each student, offering immediate feedback, strengthening autonomy and supporting teachers, it opens new paths in teaching. By approaching challenges responsibly, AI can form the basis of a future where education becomes truly personalized and accessible for all.



Activity 32. Group work. Create an infographic (with any application you want) that illustrates the key capabilities of AI in differentiating the educational process. The infographic will include examples of technologies used (machine learning algorithms, data analytics, intelligent platforms) and how they

contribute to the personalisation of teaching. Evaluation criteria: completeness and clarity of content, creativity, aesthetics and originality.



Activity 33. Group work. Create a short video explaining how AI enhances students' autonomy. The video will present a fictional scenario of using AI in the classroom, along with explanations and examples. Evaluation criteria: completeness and clarity of the content, originality of the script and aesthetics of the video.

How AI can support teachers in the classroom

AI has revolutionized the education sector, providing new possibilities to optimize the educational process and support teachers in the classroom. Leveraging AI can enhance personalised education, save time for teachers and facilitate administrative management.

One of the key ways AI can support teachers is by providing personalized teaching. Through data analytics and adaptive learning systems, AI can identify each student's needs, level and pace of learning. Applications such as adaptive learning systems suggest educational materials and tasks that meet the specific capabilities of each student, while informing the teacher about the progress and difficulties that each one faces.

Assessment automation is another important application of AI. AI can quickly and accurately evaluate multiple-choice tests, student reports and writings, offering instant feedback. Also, through advanced analysis, it can identify patterns of error in essays, helping teachers design more focused teaching. This saves time and allows teachers to focus on more creative and effective teaching methods.

Supporting the management of student behavior is a critical role of AI. Apps that track data about student behavior in the classroom can identify patterns and potential problems. For example, if a student appears to have a low level of participation or frequent interruptions, AI can alert the teacher, who can then intervene with appropriate strategies to manage these issues.

The creation of educational materials can also be facilitated by AI. Through technologies such as natural language processing, teachers can ask AI to create test questions, interactive quizzes, or even lesson plans. This automation reduces the time spent formulating extensive and complex learning materials, allowing teachers to focus on teaching.

Equally critical is the use of AI to analyze student data, through which teachers can obtain valuable information about students' progress and performance. AI makes it easy to monitor large amounts of data, highlighting long-term trends and offering recommendations for teaching strategies. For example, it can identify lessons or topics that students systematically find difficult to understand and inform the teacher to adjust their preparation or delivery.

AI can also help develop education strategies for students with learning disabilities. By analyzing data and identifying patterns in learning, AI applications can identify areas of a student's learning deficits and provide personalized plans to support them. The teacher can use these suggestions to improve the student's participation and understanding.

Another area where AI shows great potential is its integration into supporting students with special educational needs. In particular, smart applications can facilitate learning for students with disabilities by providing tools such as text-to-speech, dyslexia correctors, and software that allows teachers to adapt materials in a way-friendly to everyone. In this way, AI promotes educational equity and inclusion.

AI can be harnessed to foster collaborative and interactive activities. Through platforms that incorporate artificial intelligence, such as interactive screens or chat applications, dynamic activities can be created in group or individual contexts. AI ensures the participation of all learners, monitors the degree of contribution and provides useful tools for collaborative learning.

Facilitating distance learning, especially after the challenges posed by the pandemic, is one of AI's most valuable contributions. E-learning platforms with integrated AI tools adapt content according to each student's needs, improving the learning experience even in a digital environment. In addition, they offer personalized feedback to the teacher on participation and progress.

Automatic translation and language support in multicultural classrooms is an important way for AI support. Translation and language comprehension tools allow teachers to include students who do not speak the

language of instruction as their mother tongue. This enhances integration and multilingual support in the classroom environment.

The potential of AI also extends to optimizing communication between teachers, students and parents. Using chat platforms and virtual assistants, teachers can respond to questions, provide guidance or share resources directly and effectively. Such solutions strengthen communication and enhance collaboration inside and outside the classroom.

Finally, AI can be used to increase the level of professional development and education of teachers. Through data analysis and information utilization systems, teachers receive guidelines for continuous improvement of their skills, feedback on their teaching and suggested training, oriented to real educational needs.

To sum up, AI with applications ranging from personalization of learning to administrative management and improvement of professional development, AI is a valuable ally in the effort to upgrade the educational process. Integrating these capabilities into school environments not only enhances the effectiveness of teaching but also allows for the creation of more inclusive and interactive learning experiences.



Activity 34. Group work. Create a short PowerPoint presentation that analyzes the key ways AI affects the educational process in the areas of: (a) personalized teaching, (b) time saving and automation, and (c) administrative management. Evaluation criteria: completeness and clarity of content, academic documentation and aesthetics.



Activity 35. Group work. Create a short video that explains how AI automates assessment and analyzes students' mistakes. The video should include an example of using a relevant AI platform. Evaluation criteria: the completeness and clarity of the content, the originality and aesthetics of the video.



Activity 36. Group work (elective graded assignment). Use an AI tool (e.g. ChatGPT) to create a series of assessment questions for a specific school subject (whichever you want, as long as it exists). Next, evaluate the usefulness and accuracy of the questions. In a Word document, include the prompt you used, the questions generated by AI, and your annotation. Evaluation criteria: the completeness and creativity of the prompt, the evaluation and critique of the produced result.

Artificial Intelligence technologies useful for the development of digital learning tools

The development of digital learning tools has advanced significantly with the help of AI technologies, which provide unprecedented possibilities to personalise the educational experience, enhance interactivity and make adaptive solutions available. Ten of the most useful AI technologies for developing these tools are presented below, accompanied by examples and use cases that highlight their multidimensional impact.

The first major technology is adaptive learning, where AI is used to tailor learning content based on each student's needs, pace and level. For example, a digital tool such as a math learning platform can monitor the user's progress and suggest exercises appropriate to their level, identifying strengths and weaknesses.

The second technology concerns personalized learning paths. With the use of machine learning algorithms, platforms can propose personalized lesson plans, enhancing autonomous learning. One example is language learning apps that tailor the learning path based on the user's pace and interests.

AI also enables the creation of intelligent virtual tutors, who act as guides in the educational process. These assistants can answer students' questions in real time, provide explanations and examples, or offer troubleshooting support. A prime example is chatbots on educational platforms that act as "24/7 teachers".

Voice recognition technologies expand the possibilities of deepening learning through interactive communication. For example, learning platforms incorporating voice recognition allow students to practice grammar, pronunciation, or reading in real time while receiving feedback on their level and mistakes.

Computer vision is also a powerful tool for developing interactive educational experiences. Indicatively, immersive AR (augmented reality) scenarios can be created to understand scientific topics, such as anatomy, where students "see" three-dimensional models of bodies in a real environment.

Natural Language Processing helps create tools for text analysis and text comprehension. One example is reading comprehension detection tools, which help students accurately analyze texts or improve their own writing.

Predictive algorithms act as a reinforcing factor to prevent learning deviations or failures. For example, platforms that integrate predictive analytics can identify patterns that indicate a drop in student performance and alert teachers or coaches to potential interventions.

Emotion recognition technology can be used to improve the learning experience by monitoring students' response to learning materials. For example, cameras and AI algorithms can estimate a student's degree of concentration or frustration and adjust the platform accordingly.

AI-generated content provides innovative opportunities for digital learning tools. For example, AI systems can automatically produce exercises, quizzes or examples that are enriched with data from real students.

Finally, the use of gamification through AI, i.e. the addition of recreational elements to learning, enriches the student experience, making it more attractive. One example is the ability of a tool to dynamically adjust the difficulty level of a "training mission", ensuring the continued interest of participants.

In conclusion, the combination of the above technologies creates a strong ecosystem that supports flexible and integrated learning development. The possibilities offered by AI open new avenues for access to education and better personalization of the learning journey, making digital platforms more efficient, friendly and adaptable.



Activity 37. Group work. Create an infographic (with any application you want) that illustrates the role of AI technologies in personalization, enhancing interactivity and the adaptive solutions they offer to learning. The infographic should include examples of technologies and their benefits. Evaluation criteria: completeness and clarity of content, creativity, aesthetics and originality.



Activity 38. Group work. Create a video that simulates the operation of a chatbot on an educational platform. The video should include interaction with a "student" to solve educational problems. Evaluation criteria: the realistic depiction of the assistant's function, the creativity, aesthetics and originality of the video and the structure and consistency of information.

Ways in which AI can facilitate the process of evaluating and feedback students

AI-powered platforms have the potential to redefine the assessment and feedback process in education, providing flexible and personalized ways to enhance learning. Thanks to the combination of data, analysis and advanced algorithms, AI can automate critical processes, provide more accurate feedback and improve the educational experience for both students and teachers. Specific examples and scenarios are analysed below to illustrate how these platforms can contribute to effective student assessment and targeted feedback.

AI can automate the assessment of essays, using natural language processing algorithms, which are able to analyze syntactic and grammatical structure, assess speech coherence, and offer feedback on the student's argumentation. This reduces the length of the process for the teacher and allows for greater consistency in assessment.

An important contribution of AI is the diagnosis of learning disabilities through personalized self-assessment tests. Using pattern-detection algorithms, AI can identify areas where students are lagging behind and suggest personalized learning materials and activities.

In addition, AI systems promote the creation of adaptive learning. Through platforms that analyze students' responses in real time, they can adjust the level of difficulty or type of exercises provided, based on their needs and abilities. This ensures that students stay within their "proximal growth zone".

Feedback can be interactive and real-time. AI tools, such as chatbots, can respond directly to students' questions, pointing out mistakes in exercises and giving harmonised explanations to improve them. More importantly, immediacy enhances students' self-motivation and independence.

In addition, AI can provide personalized feedback to students, based on data on their performance. For example, if a student repeatedly has difficulties with specific math concepts, an AI platform can identify their weak points and automatically create personalized learning paths. A learning system can suggest additional materials, such as videos, interactive exercises, or even exercises with increasing difficulty, to enhance the student's understanding of the specific area. In practice, this form of feedback is faster, more targeted and proven to increase the effectiveness of learning.

In the area of evaluation, AI can identify bias effects or objective factors potentially influencing the assessment. Through statistical analysis of assessment data, teachers gain a better picture of how fair and accurate their methods are.

The use of data analysis by AI provides the ability to monitor each student's progress in a longitudinal way. Through the collection of data from different stages of the learning process, it is possible to create personalized profiles, which support a strategic and oriented planning.

AI tools also play a role in creating interactive assessment scenarios, such as learning games and simulations that assess students' skills and knowledge in various situations. In this way, the assessment becomes experiential, keeping the students' interest.

AI also contributes significantly to the assessment of oral skills. Applications based on speech recognition can assess the quality of pronunciation, flow and clarity of speech of students in activities such as presentations or speeches. This ability can enhance how students respond to public speaking or exams.

The support of AI is also observed in the collection of qualitative data through systematic observation of students. The algorithms can analyze how students react to educational content, record their attention, and suggest to teachers ways to promote their interest.

In addition, the emotional learning factor can be improved through the use of AI. Platforms can analyze student behavior patterns, such as time to complete exercises or frequency of mistakes, to identify potential

risks, such as lack of confidence or anxiety. For example, a program that notices that a student is taking too long to answer questions may refer special guidance without requiring human intervention.

Finally, AI can support collaborative learning through digital platforms, where students collaborate on assignments and at the same time receive information to adapt their efforts. Through data analysis, systems can enhance active participation and balanced contribution to group activities.

Overall, AI has the potential to enrich the educational process, making it fair, adaptive and effective. The above capabilities are just a few examples of how this technology can reshape the way we deal with assessment and feedback, preparing students with modern skills.



Activity 39. Group work. Create an infographic (with whichever app you want) explaining how natural language processing algorithms can evaluate essays. It will include the steps of the process (e.g., grammar analysis, coherence, argumentation) and the benefits of the method. Evaluation criteria: completeness and clarity of content, creativity, aesthetics and originality.

How can AI identify and address learning difficulties or gaps in students' knowledge?

AI can be a highly effective tool for identifying and addressing learning difficulties or gaps in learners' knowledge. The integration of AI in education is based on advanced data processing, personalised learning and pattern recognition techniques. Through data analysis, AI identifies problems that might otherwise be overlooked in a classic educational setting. Its ability to analyze information at scale and provide customized solutions opens up new perspectives in supporting students with diverse needs.

An example of AI identifying learning gaps is the use of adaptive learning systems. AI-based learning platforms, such as Carnegie Learning or DreamBox, monitor student performance through interactive activities. By analyzing the student's interactions with the system, AI can identify specific topics or concepts that the student struggles with. For example, if a student has continuous incorrect answers to specific math problems related to fractions, AI can demonstrate that the student has gaps in the basic concepts of subtraction or multiplication. Based on this analysis, the system can adapt the teaching methodology, offering additional explanations or exercises focused on these fundamental gaps.

Another important field of application of AI is emotional state analysis and real-time data collection through behavioral observations. Using visual information analysis algorithms, AI tools embedded in equipment such as cameras can assess facial expressions, body language and student interaction with the material. For example, if the system detects that a student is showing signs of frustration or fatigue during certain subjects, this may signal that their understanding of that subject is insufficient or that there are stressors affecting their concentration. Such a tool enables the teacher to intervene in a more targeted and supportive way.

AI also facilitates differentiated learning through the use of personalised training programmes. An example of such a scenario is the use of voice recognition tools for Learning English as a Second Language (ESL). Platforms like Duolingo use machine learning to identify mistakes in pronunciation or grammar and provide instant feedback to the student. Thus, the student receives a learning experience tailored to his own particular needs.

AI also has the ability to predict future learning disabilities. By utilizing historical data concerning the student's performance, algorithms can predict areas in which the student may experience difficulties. For example, an AI system that analyzes the results of a physics test can detect that students who do not understand the concepts of dynamics may later struggle with understanding energy. With this information, teachers can intervene earlier and facilitate enhanced understanding with targeted activities.

AI can also help identify more serious learning disabilities, such as dyslexia or dyspraxia. Special software can analyze the reading rate, accuracy and speed of writing, identifying patterns associated with such difficulties. For example, if a student has difficulty distinguishing certain letters or reading with flow, the system may suggest a more detailed assessment by an expert so that additional support measures can be taken.



Activity 40. Group work. Create a short PowerPoint presentation that describes a scenario for using AI to support students with learning disabilities. Evaluation criteria: the clarity and realism of the script, its innovation, the aesthetics of the presentation.



Activity 41. Group work. Create a short PowerPoint presentation presenting the future evolution of emotion analysis systems and how they can affect crisis management in the classroom. Evaluation criteria: the originality of the ideas as well as their realism and the aesthetics of the presentation.



Activity 42. Group work (elective graded assignment). Using an AI of your choice, create a "Teacher's Guide" for differentiated learning. In a Word document, copy the prompt you used, the teacher's guide. Also, comment on the result produced in terms of its completeness and the feasibility of the proposals made by AI. Evaluation criteria: professionalism of the guide, usability of the content and quality of the commentary.

The impact of AI on enhancing access to quality education for remote or underserved communities

AI has emerged as a powerful tool to enhance access to quality education, especially for remote and underserved communities. Although challenges remain, its applications offer important solutions that can improve the educational experience, reduce inequalities and create opportunities for people who otherwise would not have access to adequate educational resources.

One of the most prominent examples is the use of AI to deliver personalized lessons through adaptive educational platforms. Apps like Duolingo, Khan Academy and others leverage AI algorithms to analyze each student's needs. By evaluating their performance and providing customized content, students from remote areas can receive quality and personalized education, without the immediate need for physical presence of instructors. For example, a student in a rural community in Africa can be trained in mathematics or foreign languages through such applications, receiving constant guidance, feedback and support.

Another area where AI has had a positive impact is the translation and adaptation of educational materials in many languages and cultural contexts. By using translation systems such as Google Translate, but also by developing more specialized solutions for educational use, students who speak different languages or dialects can access materials that were previously only available in dominant languages. This is especially critical for communities living on socioeconomic margins or for indigenous peoples. As a result, the preservation of cultural identity is promoted while educational access is enhanced.

AI also has the potential to offer educational opportunities to students with disabilities. Applications such as digital readers for the visually impaired, platforms with speech-to-text or text-to-speech tools, and software that enable real-time sign language can bridge the gaps often faced by students with special needs. This approach not only empowers them to gain access to quality education, but also creates an inclusive learning environment that promotes social equity.

In addition, AI can offer educational support through virtual tutors and chatbots. In particular, educational chatbots can provide guidance and explanations in real time, covering the function of the teacher in areas where there is a shortage of teaching staff. An example might be a rural community in India, where secondary school students can rely on educational chatbots for help with science lessons. This way of daily support enhances teaching and allows students to solve questions without significant delays.

Another use case concerns teacher training technology in remote communities. Through machine learning algorithms, teachers' own training needs can be analyzed, offering modern professional development courses or guidelines to address specific educational challenges. A teacher in an isolated village may, for example, receive training on new teaching methods or applications, enhancing the quality of the educational work he offers.



Activity 43. Group work. Create an infographic (with whichever app you want) that explains how AI can reduce educational disparities in remote or underserved communities. The infographic should include examples of applications (e.g., Duolingo, Khan Academy), statistical data supporting the effectiveness of these platforms, and key challenges and solutions. Evaluation criteria: completeness and clarity of content, creativity, aesthetics and originality.



Activity 44. Group work. Choose a short educational text (half a page) written in English and translate it into Greek using the AI of your choice. Then make translation improvements based on cultural specificities of our language. In a Word document, copy the original text into English, the original translation from AI, your own correction. Also comment on the advantages and disadvantages of AI translation and do any other

Labelling you consider important. Evaluation criteria: the accuracy and quality of the final translation, the quality of your annotation.

How AI helps educate students with special needs or disabilities

Artificial Intelligence (AI) is today an important factor in reshaping the educational field, offering innovative solutions to support students with special needs and disabilities. Through the application of specialized tools based on the power of AI, a customized and personalized educational experience is possible, which fully meets the unique needs of each student.

AI improves alternative communication through applications that convert speech to text or text to speech, allowing people with speech difficulties to communicate effectively. One example is the use of tools such as CoughDrop or Proloquo2Go, which enable students to express themselves using visual icon options and personalized voice data.

For students with limited ability or blindness, AI facilitates access to educational materials through image recognition technologies and voice notifications. Platforms such as Microsoft's Seeing AI and Be My Eyes allow users to understand the content of texts, images, and physical objects through voice descriptions.

AI-based facial and emotion recognition systems play a key role in supporting students with Autism Spectrum Disorder. Through them, students can practice understanding expressions and emotions, facilitating their social interactions. Special applications, such as Brain Power, provide opportunities to understand social signals in a virtual environment.

For students with dyslexia, AI provides support by creating custom reading and writing tools. Software such as Grammarly or Ghotit detects and corrects grammatical or spelling errors, while suggesting improvements, boosting their confidence in written expression.

AI empowers learning through games by offering personalised activities for students with learning disabilities. Platforms, such as DreamBox for math, adjust content in real time according to a student's performance, which encourages them to participate and progress at their own pace.

Students with physical disabilities can benefit from artificial intelligence technology through control devices based on voice or eye movement. Technologies such as Tobii Dynavox, which combine customizable eye tracking, allow students to navigate the digital world using their eyes exclusively.

Another valuable tool to enhance the autonomy of students with intellectual disabilities are personal virtual assistants. Through platforms such as Amazon Alexa and Google Assistant, students can manage daily activities, routines and personal learning schedules, improving the structure and organization of their day.

AI also contributes to the creation of fully accessible educational materials by providing real-time transcription of assignments, videos and lectures. Tools such as Otter AI offer the ability to automatically record and convert speech to text, offering equal attendance opportunities to students with hearing loss.

Students with Attention Deficit Hyperactivity Disorder can benefit from AI-based apps to improve their time and attention control. These apps, such as Forest or Focus@Will, adapt practice environments, allowing students to concentrate better.

Finally, AI is integrated into supporting environmental accessibility, facilitating the participation of students with physical or other disabilities. One example is the use of accessible robots based on technologies such as Leka, which encourages interaction, offers sensory support, and aids in instructional design.

AI, through these examples, demonstrates its power to enhance equity in education by supporting students with disabilities and needs to achieve their full potential. Continued research and development in this area promises even more innovations that will shape the future of education.



Activity 45. Group work. Create a video explaining the use of an AI app for students with disabilities (e.g., Seeing AI, Brain Power). The video should include a practical demonstration of the application (real or simulated), explanations of the functionality of the tool and the benefits for students. Evaluation criteria: technical precision and clarity in presentation, creative and practical approach.



Activity 46. Group work. Choose two AI apps that support students with special needs. Then create a short PowerPoint presentation in which you present them comparatively, analyzing their strengths and weaknesses. Evaluation criteria: clarity in presentation, aesthetics of presentation, comprehensive analysis and use of data.

Examples of the integration of Artificial Intelligence in the educational process

The integration of AI into the educational process has provided numerous benefits on a global scale, reshaping teaching, learning and administration at all levels of education. Here are ten concrete and successful examples and use cases that illustrate how AI can add value to the education system.

A first example concerns the use of personalised education systems, such as the Aura programme, which was developed to tailor teaching content to each student's needs. AI in these systems assesses the strengths, weaknesses and pace of learning of the learner by providing personalized lessons and exercises. In this way, the efficiency of teaching is improved, while at the same time the confidence of students with different skill levels is enhanced.

Another example is the Grammarly system, which is used to enhance writing skills in both students and teachers. AI in this area provides analyses of spelling, grammar, style and structure of texts, making the educational process more efficient. This tool is extremely useful in teaching foreign languages, as well as for students who are required to write scientific papers.

Duolingo is a popular language learning app that uses AI to dynamically adapt teaching methodology. Based on user behavior and performance, the app adjusts questions, difficulty levels, and learning breaks to ensure optimal outcomes.

A fourth example relates to the Coursera platform, which uses AI algorithms to analyze learning activity data and provide suggestions for further courses or skills to develop. Thus, students have the opportunity to carve out personalized educational paths that meet their professional needs.

In Japan, robots like Pepper are used as teaching assistants in classrooms, enhancing communication and offering games to cultivate skills. Pepper, through natural language processing with the help of AI, helps children practice social skills and develop an interest in learning.

Systems at universities, such as the University of Arizona, analyze student attendance, score, and activity data to identify potential learning problems early. Teachers can thus intervene early, offering more support where necessary.

Platforms like AdmitHub provide answers to student questions about admission applications, course schedules, and attendance requirements, cutting red tape and saving human resources.

Labster allows students to explore complex topics in physics or biology through a virtual and interactive space. With the help of AI, users can process scenarios that simulate real conditions through a safe learning environment.

The application of AI in the creation of educational content through authoring algorithms is another example. These systems help create quizzes, tests and training exercises in no time. For example, Content Technologies, Inc. uses AI to compose digital textbooks that adapt to students' learning needs.

Tools like Google's Machine Translation or DeepL instantly translate teaching materials, allowing instructors and students from diverse cultural backgrounds to communicate seamlessly and collaborate in real-time.

The Century Tech system analyzes students' performance and suggests personalized learning materials. In UK schools it has been used to support pupils in subjects such as maths and science, helping teachers identify knowledge gaps and offer tailored activities.

Khan Academy has integrated artificial intelligence into its platform through Khanmigo, an educational assistant that guides students as they solve problems. The assistant does not give ready-made answers, but asks questions and provides suggestions, enhancing the comprehension process.

The Squirrel AI framework in China uses artificial intelligence to personalize lesson teaching. It analyzes each student's individual needs and adapts content to bridge learning gaps. This has led to improved student performance, particularly in subjects such as math and physics.

Carnegie Learning has developed AI-powered programs that enhance math and English language teaching. The MATHia system is used in the United States to adjust exercises based on student level and provide instant feedback while teachers receive progress reports.

Querium uses AI to prepare students for tests and exams. It offers short personalized learning sessions that help students practice complex problems, adjusting the difficulty of questions according to their performance.

IBM's Watson Tutor program leverages AI to offer interactive lessons to university students. It is used to analyze large amounts of data and adapt educational materials to meet each student's level, reducing the failure rate in difficult courses.

The KidSense AI platform was developed to support children's language development through voice recognition. It is used in preschool and elementary programs in the United States to detect language difficulties, providing children with personalized activities that enhance speech and comprehension.

Knewton's Alta system is used at universities to teach courses such as economics and science. Artificial intelligence analyzes student performance and dynamically adjusts content, giving teachers data on student progress and potential difficulties.

The DreamBox Learning platform enhances the teaching of mathematics through artificial intelligence. It is used in schools in the United States and Canada to analyze how students interact with problems and provide them with exercises that suit their level, improving their understanding and self-confidence.

Factors affecting students' acceptance and trust in AI tools

Students' acceptance and trust of AI tools depends on many factors related to the perception, experience and functionality of these tools. These factors do not operate in isolation; on the contrary, they often interact, creating a complex socio-technological dynamic.

A critical factor is the usability of the tool. AI tools that are easy to use and understand in terms of their functions tend to gain more acceptance. For example, an AI-based educational platform that allows students to navigate easily, find quick answers, or work efficiently without complicated processes attracts more trust.

Personalizing a tool's answers and functions is also an important factor. The more AI adapts to each student's needs, knowledge and learning pace, the higher the likelihood of accepting the tool. For example, a system that detects the student's areas of weakness and adjusts lessons accordingly provides a personal learning experience that is more engaging.

Personalization plays an important role. Students are more likely to trust a tool that identifies their unique needs. For example, if a platform for historical research suggests sources based on the student's previous questions and interests, he feels that the tool "understands him", enhancing its use.

Transparency in the operation of AI affects acceptance. If a student doesn't know how an assessment tool generates grades or recommendations, they may question their objectivity.

The accuracy of the results is fundamental. If a tool for detecting logical errors in essays consistently ignores errors or generates incorrect corrections, students will reject it. Conversely, if a tool repeatedly provided correct and accurate suggestions or solutions, students will trust it more. For example, an application that practically corrects linguistic or numerical errors accurately can create a sense of proficiency and satisfaction in users.

Direct and understandable feedback and explanation of how AI works is another important factor. When students understand how AI makes decisions or offers suggestions, a sense of trust is enhanced. For example, if a math solution tool shows all the steps to finding the solution, this feature can inspire confidence and a sense that the tool is not working as a black box.

In addition, interaction with the AI tool should inspire emotional confidence. The use of polite, understandable and non-discouraging answers or messages strengthens the relationship of trust. A tool that provides constructive feedback, without judging the student, creates a positive learning environment.

The ethical use of data affects acceptance. Students who know their data is protected and not used for commercial purposes are more likely to interact with AI tools. For example, a platform that asks for explicit consent and explains how classroom data will only be used for educational purposes creates a sense of security.

Students' pre-existing experience with technology and their attitudes towards innovations can influence how they approach AI tools. Students who are more tech-savvy tend to be more open to accepting such tools. For example, a student who has already used applications such as virtual teachers or interactive tools is more likely to enthusiastically accept a new AI tool.

The wider public perception of AI also affects students. If society presents positive examples of AI applications in education or other areas, this facilitates the acceptance of the tools by students as well. For example, news media highlighting AI's contribution to improving learning increase students' good disposition.

Integrating AI into the daily educational flow is important. If a tool is not linked to the rest of the curriculum or to the teacher's methods, students may find it unnecessary. Conversely, when the use of AI is presented as a natural part of learning rather than something foreign or marginal, students adopt it more easily. For

example, virtual assistants that chat with students about repeating concepts recently covered by the teacher in class reinforce the value of the tool as an extension of the classroom.

Support from teachers affects trust. If teachers actively and enthusiastically use an AI tool in the classroom, students tend to take it more seriously. For example, when a physics teacher uses artificial intelligence simulations to explain quantum phenomena and encourages students to use them for experimentation, the legitimacy of the tool is enhanced.

The cultural and social identification of tools plays a role. For example, AI tools that recognize linguistic or cultural differences, such as an app that offers examples based on local history or demotic dialect, tend to be more accepted by groups of learners who feel the tools "speak their language."

Finally, the ability of AI to promote students' autonomy and self-esteem influences its use. If a student encounters an artificial intelligence tool for exam preparation that allows them to track their progress and set realistic goals, their sense of control reinforces their positive attitude towards them.

In conclusion, students' acceptance and trust of AI tools depend on a multifaceted set of factors related to experience, functionality, ethics and social dynamics. However, consciously designing tools that work transparently and with integrity can boost trust and make AI an essential tool in the modern educational process.



Activity 47. Group work. Create an infographic (with any application you want) on the factors that influence the acceptance of AI tools in the classroom. The infographic summarises the key factors described in the text, using examples cited, and will include links between factors to highlight their interaction. Evaluation criteria: completeness and clarity of content, creativity, aesthetics and originality.



Activity 48. Group work. Create a PowerPoint presentation that explains the importance of personalization and personalization in AI tools. The presentation should include an example of an AI tool that adapts to students' needs, as well as a justification why this factor is key to acceptance. Evaluation criteria: clarity in presentation, aesthetics of presentation, comprehensive analysis and use of data.

Factors affecting teachers' acceptance and trust in AI tools

Teachers' acceptance and trust in AI tools are crucial issues for the effective integration of these technologies into the educational process. Although AI offers many possibilities and innovative solutions, teachers' attitudes are influenced by a multitude of factors related to their personal experience, knowledge and the context in which they work.

A key factor is familiarity with technology. Teachers with limited familiarity with digital platforms and AI tools are more likely to express reticence or even fear towards the use of these technologies. For example, if a teacher has no previous experience with algorithmic assessment systems, they may distrust their results, even if they are documented to be accurate.

The time required to learn and implement the tool is crucial. If an AI platform requires setup hours for each lesson, busy teachers may ignore it. In contrast, tools with automatic integration, such as an automatic assessment system or a chart generator that connects directly to the teacher's online department and creates one-click visualizations, tend to be preferred.

The reliability of the data used by AI tools also plays a crucial role. These tools need high-quality and diverse data to perform properly. Otherwise, bias and inaccuracies may arise, which reduces trust. For example, if an algorithm is based on one-dimensional or insufficient data, it is likely to produce biased results.

The reliability of evaluation results is critical. If an AI platform for evaluating written assignments produces inaccurate or unfair grades, teachers will reject it, even if it saves time. In contrast, tools that have been verified by human evaluation tend to gain trust.

Another factor is linked to the perception of the effectiveness of AI tools. Teachers have greater confidence in technological tools that demonstrate their added value in the teaching process. For example, an AI tool that supports personalized learning by tailoring the content to each student's needs can motivate teachers to trust it if they see a positive impact on student performance.

The ease of integration into existing teaching practice affects acceptance. If an AI tool requires radical changes in teaching method or is not linked to education systems already in use, teachers may find it aggravating. For example, an app that creates automatic tests based on the teacher's textbook and notes is more likely to be used by a teacher who doesn't want to completely reformat their material.

The availability of educational support and training is important. Teachers without a technical background may find it difficult to use AI tools without adequate instruction. For example, in a school where there is a lab for using a chemical reaction simulation platform, teachers feel more comfortable incorporating it into their lessons.

Transparency in how AI works is a third important factor. Teachers want to understand how algorithms arrive at a conclusion or proposition, particularly in sensitive areas such as student assessment. If how a tool works remains unclear, distrust will likely increase. For example, a professor may question the results of an evaluation algorithm if he does not understand how it takes into account the various data.

The ability to adapt the tool to classroom needs is critical. Teachers prefer tools that can be configured according to the level or content they teach. For example, a teacher might use an AI tool to create grammar exercises, choosing to focus on specific rules that correspond to their students' weaknesses, rather than accepting general exercises that cannot be customized.

Fear of being replaced or downgraded in a teacher's role can reduce acceptance. If an AI tool is presented as an "autonomous teacher", teachers may react. Conversely, tools that emphasize complementarity, such as a chatbot that helps answer key student questions so that the teacher can spend time on complex concepts, tend to be welcomed.

Ethical and legal compliance, especially in data protection matters, is critical. Teachers in countries with strict data protection standards, such as GDPR, will reject tools that do not guarantee secure storage of student information. For example, a performance analytics platform that encrypts data and automatically deletes information after the end of the school year tends to be considered trustworthy.

Proving the scientific basis of the tool affects trust. Teachers are more likely to trust tools that are based on pedagogical research or have been evaluated by independent bodies. For example, a reading app that uses algorithms tested at academic universities that improve reading comprehension tends to be more easily adopted.

The attitude of the community, including students and parents, affects teachers' trust in AI. Students' positive response to tools such as interactive learning platforms can motivate teachers to trust them. For example, if parents perceive AI as a supportive tool rather than a threat to human teaching, a positive social context is created.

Professional development and further training are equally important. Teachers are more likely to accept and trust AI tools if they have previously received appropriate training on their use. For example, seminars on the use of AI in teaching or integrating AI courses into training programmes can bridge doubts and fears.

Finally, the ability of the tool to enhance the creativity or professional development of the teacher plays a role. For example, tools that offer new teaching strategies, such as simulations of interdisciplinary problems to teach the teacher how physics relates to ecology, can stimulate interest and acceptance.



Activity 49. Group work. Create an infographic (with whichever app you want) that illustrates the various factors that influence teachers' acceptance and trust in AI. Organize these factors into categories (e.g., technological, educational, ethical) and you will use examples from the text. Evaluation criteria: completeness and clarity of content, creativity, aesthetics and originality.

How is the role of the teacher being reshaped due to Artificial Intelligence?

The integration of AI into education transforms the role of the teacher from traditional "knowledge imparter" to "learning experience designer" and "support provider". Instead of focusing on teaching basic concepts, the teacher undertakes to direct, inspire and tailor learning according to each student's needs. For example, in a physics class, AI can autonomously teach the concept of gravity through interactive simulations, while the teacher focuses on organizing practical experiments that demonstrate the application of theory.

Teachers become experts in data analysis, using platforms that report which students have difficulties with specific grammatical structures or mathematical concepts. In a literature class, a teacher can recognize through AI that a group of students have difficulty analyzing metaphors and design a discussion that focuses on interpreting symbolism, rather than spending time on theoretical slides.

AI allows teachers to create personalized learning plans. For example, a chemistry teacher can use AI data to assign each student a different set of experiments depending on their speed of comprehension, while working with students who need extra guidance on more complex topics.

The role of the teacher extends to the promotion of socio-synesthetic skills. In a school where AI manages grammar learning, the teacher can organize team collaboration activities that enhance communication and critical thinking, using topics from students' responses to written assignments that AI has already assessed.

Teachers become technology coordinators, helping students use AI tools with ethical and critical awareness. Thus, the teacher is called upon to assume the role of supervisor in the use of AI by students. As students increasingly use tools such as chatbots and learning platforms that use algorithms, teachers need to ensure that students use them responsibly and effectively. For example, a teacher may need to explain to students how they should evaluate the information provided by an AI system, recognizing any misinformation or bias.

AI replaces some administrative and non-teaching tasks of teachers, allowing them to focus more on pedagogical interactions. Automatic assignment corrections or progress-tracking systems relieve teachers of time-consuming tasks. An example is software that proofreads multiple-choice tests or student writings, allowing the teacher to spend more time deepening the content.

Thus, AI shifts the burden of assessment from the teacher towards continuous feedback. For example, in a geometry class, while AI provides immediate corrections to exercises, the teacher can evaluate the creative application of concepts in design projects, where students use geometric principles to create models. Teachers develop capabilities in managing mixed classrooms, where AI supports students with different levels. In a foreign language class, the platform can offer real-time vocabulary exercises, while the teacher focuses on pronunciation and cultural literacy through dialogues and simulations.

The role of the teacher now includes ensuring the integration of AI without altering human relationships. For example, in a digital arts class, the teacher can use AI tools to create basic drawings, but ask students to elaborate on them, emphasizing the value of human creativity.

There is a need for continuous professional development and training in technology supervision skills. Teachers are required to constantly monitor AI developments in order to incorporate best practices into their lessons. For example, learning innovative pedagogical tools, such as AI-based gamification systems, requires teachers to be able to self-educate and adapt.

Finally, teachers become partners in innovation, experimenting with new tools and methodologies. In a biology lab, a professor can combine physical experiments with virtual AI simulations that illustrate cell division processes, giving students a comprehensive experience that enhances both theoretical and practical understanding.

As can be seen from the above, AI does not replace the role of the teacher, but expands and upgrades it, turning it into a multidimensional source of knowledge, guidance and management. Adopting the possibilities

offered by AI requires teachers to approach their teaching with innovation, flexibility and pedagogical ethics. Therefore, the advent of AI in education does not weaken the importance of the teacher but, on the contrary, strengthens his position as an indispensable factor in the modern learning world.



Activity 50. Group work. Create a short video highlighting changes in the role of the teacher due to AI. You can include interviews with teachers, use cases for AI tools, or simulations of courses with and without AI. Evaluation criteria: accuracy in the information presented, creativity, aesthetics and originality of the video.



Activity 51. Group work (elective graded assignment). Use the AI of your choice and create a "good use of AI" guide for teachers, focusing on ethical and pedagogical aspects. Then reformat the text according to your own critical perspective. In a Word document, include the prompt you used, the final text as you formatted it, and criticism of the text produced by AI. Evaluation criteria: the comprehensive coverage of ethics and pedagogy, the quality of the prompt, as well as the quality of your commentary .

How can future teachers prepare for the use of AI in their workplace?

The use of AI in education is expected to play a key role in the coming years, bringing revolutionary changes in teaching practices, the learning experience and the management of educational resources. Future education professionals are therefore required to prepare clearly and strategically to take full advantage of the possibilities offered by AI. This preparation requires familiarity with the applications of technology and the development of digital skills, as well as an understanding of ethical and pedagogical frameworks related to technological developments.

One of the most critical aspects of preparation is learning AI-powered digital and technological tools. For example, teachers can be trained in using AI-based data analytics programs to assess students' progress. With these tools, they can monitor each student individually, identify weaknesses and provide personalized support. In addition, familiarity with adaptive learning systems, which regulate content and difficulty based on the needs of each student, is crucial to enhance individualization in the classroom. Developing skills in leveraging AI-based content creation tools, such as digital platforms that enable interactive courses or translation technologies to support multicultural learners, is a second key priority. Through them, teachers can provide more accessible and inclusive learning experiences.

Another particularly important strategy for integrating AI into education is training on the capabilities of autonomous educational chatbots. These can answer student questions, assign assignments, and provide ongoing support even outside the classroom. Future professionals must learn to control and modify the settings of these systems to meet the educational needs of their students.

Understanding AI as an analytical and predictive tool for education management is equally essential. Future educational leaders can use AI to manage resources, such as the efficient allocation of teaching staff, or to improve processes within the school unit. At the same time, they can be trained in the use of technologies that analyze exam results and predict learning outcomes to design long-term strategy.

As AI reshapes the way students are assessed, emphasizing data and behavioral analytics, the teacher is challenged to interpret the data collected, such as patterns from tests that may highlight knowledge gaps, and reinforce students according to the findings. This interpretation requires from teachers a new form of specialization, since statistical analysis is part of this process.

Managing AI-assisted academic transparency is also critical for the educational world. Tools such as plagiarism detection systems or learning element authentication simulations can be used to ensure reliability in examination and assessment processes. Also, teachers can prepare for the use of AI to develop social skills and feelings of empathy in students through AI-based simulations, which allow students to experience interaction and collaboration scenarios. This facilitates the development of critical life skills in a virtual reality environment.

Another area of development is the use of AI tools to rehabilitate courses in areas of reduced opportunity. For example, remote learning platforms with integrated AI can adapt to students' accessibility difficulties by enabling support through mobile devices or offline learning tools. The role of AI in the lives of different students, such as children with disabilities, offers an excellent opportunity for education in this area. Technologies such as digital text readers or speech assistants can make learning more accessible, and teachers need to know how to use them effectively. Finally, it is necessary for education professionals to be trained in managing ethical issues that may arise from the use of AI. The concepts of privacy, transparency, and bias that can be embedded in AI technologies require careful supervision by teachers to ensure a fair and inclusive educational experience.

Based on the above, it is clear that integrating AI into education is not only a technological advance but also a strategic tool to improve the learning environment. By emphasizing education, developing and implementing ethical standards, future education professionals can shape a modern and successful educational field.

Ethical issues and implications of applying AI to education

AI in education can be a tool of greatness if used with respect for human dignity, equality and social responsibility. However, without care, it risks turning education into a control mechanism that reinforces inequalities and degrades human intellectual freedom. The balance depends on ethical frameworks, dialogues with all parties, and a clear priority: man over technology.

The phenomenon of "cold" learning

Education is not only about transmitting knowledge but also about emotional connection with the teacher. AI systems offer personalized educational content based on student data. However, there is a risk of losing human contact and socialization, as learning becomes hyper-individual. Dilemma: How to balance technological efficiency with the need for social skills and emotional development?

Automated Assessment: Algorithms that grade assignments or exams can be unbiased, but also ignore creativity or contextual complexity (e.g., a student's emotional background). Example: A text written by a student with dyslexia may be unfairly rated as "inferior" by an algorithm.

Data protection and child privacy

AI educational tools collect data such as academic performance, behavioral patterns, or even biometric data (e.g., eye-tracking). Dilemma: How to use this data without violating children's privacy? Risks: Marketing data from companies or using it for manipulation (e.g., targeted advertising).

Inequality and the digital divide

Students attending schools with limited resources may not have access to advanced AI systems, such as adapted learning platforms or smart assistants. In poorer countries or regions with unstable internet infrastructure, the use of advanced AI tools is limited, creating a new kind of educational inequality. Example: Students who use advanced AI tutors have an advantage over those who rely only on traditional methods.

Bias in educational content

AI models are trained on data that may recycle stereotypes (e.g., racial or social biases). Dilemma: How to guarantee that AI does not reinforce inequalities through educational content?

Replacing or strengthening teachers

AI systems can take on roles such as assessing or teaching basic knowledge, but they threaten the human teacher-student relationship, which is critical for moral and emotional development. Dilemma: When is AI a "helper" and when does it become a "replacement" for teachers?

A question of reliability and quality of knowledge

The use of AI to create content and make decisions raises questions about the reliability of information and the role of teachers.

Disinformation and inaccuracies

LLMs like ChatGPT are not foolproof and may produce incorrect or fabricated information. Students who rely too much on AI for answers may not develop source assessment skills.

Loss of critical thinking

Over-reliance on AI for answers (e.g., ChatGPT for tasks) can undermine the ability to analyze and make moral judgment. Example: Students copying AI-generated texts without critically editing them.

Automation of training

If students rely on AI to write assignments or answer questions, there is a risk that effort and creativity will decrease.

Job insecurity

Teachers may lose their role as drivers of knowledge, as AI can provide personalized teaching experiences. If teachers are replaced by AI systems in a discriminatory way, there is a question of human value and social responsibility.

Discrimination based on skills

AI systems that assess student progress may categorize students into "strong" and "weak," depriving the latter of opportunities to improve. If the effects of AI are used to place students at different levels of learning, they can entrench social inequality.

Monitoring and supervision of students

AI algorithms used to detect plagiarism or evaluate students can result in excessive scrutiny and limit physical interaction in class. Proctoring systems can track students' movements via camera, which has raised concerns about privacy violations.

Psychological and moral implications

AI systems that constantly measure performance can create stress or over-reliance on technology. Example: Students who feel constantly being monitored by algorithms may lose their creativity for fear of "mistakes".

Ethical direction

Who defines the values transmitted through AI? Example: An AI model that promotes individualism over solidarity because of its education data.

Reliance on technology platforms

Schools based on private AI platforms risk losing control of educational content and becoming financially and technologically dependent on companies. Dilemma: How to maintain public and free access to quality education?

Cultural extinction

AI systems that promote "universal" knowledge can ignore or degrade local languages and cultural narratives. Most AI applications are designed for the English language or specific cultural groups. This can marginalise learners from different linguistic and cultural backgrounds. AI algorithms may suggest content that does not meet local educational needs.

Skills of the future

AI is changing the needs of the labor market. If the education system does not adapt, students may not be prepared for the new situation. Skills such as critical thinking, creativity and ethical thinking in technology should be taught.

Conclusion

The integration of AI into education brings significant changes but also raises serious ethical dilemmas. Educators, researchers and policymakers need to look for ways to use AI responsibly and balanced, ensuring data protection, knowledge reliability and keeping the human factor in teaching.



Activity 52. Group work. Create an infographic that presents the key ethical challenges related to AI in education. The infographic should include visually visible categories, such as 'equality', 'human resources enhancement' and 'audit and inequalities risks'. Evaluation criteria: completeness and clarity of content, creativity, aesthetics and originality.



Activity 53. Group work. Create a PowerPoint presentation that presents the key ethical challenges related to AI in education. Evaluation criteria: clarity in presentation, aesthetics of presentation, comprehensive analysis and use of data.



Activity 54. Group work (elective graded assignment). With the help of the AI of your choice, design an awareness campaign called "Ethical use of AI in education". In a Word document, list the prompt you provided, the text produced by the AI, and the corrections you made. Evaluation criteria: the accuracy of the prompt, the critical and synthetic way of development and the clarity of positions, The originality of the campaign.

Proposals and solutions for ethical application of AI in education

In order to harness Artificial Intelligence (AI) in a way that promotes quality and fair education, it is necessary to establish guiding principles, regulations and pedagogical strategies that ensure its ethical use.

Some basic axes and principles are the following:

- Transparency: Algorithms should be explainable and students/parents should know how their data is used.
- Human-centered approach: AI should act as a tool to empower teachers, not as a replacement.
- Equality policies: Free access to AI tools for all and teacher training to address bias.
- Strict data protection: Regulations prohibiting the commercial use of child data (e.g., GDPR for children).
- Ethical AI Education: Integrating lessons on the ethical dilemmas of AI into school curricula.

Practical solutions for the ethical use of AI in education

The ethical use of AI in education requires a balance between innovation and the protection of students and teachers. The following solutions help create a fair, safe and effective learning environment where AI is used as a tool to enhance education, without undermining the human factor.

Ensuring equality in access to AI

- Promoting digital equality. Providing free or affordable AI tools to schools with limited resources. Create training programs for teachers and students to be able to use AI regardless of digital skills.
- Inclusive personalization. Design multilingual and culturally sensitive algorithms that adapt to students' needs regardless of language or socioeconomic level. Development of educational tools that are compatible with simple devices, so that they can be used by students who do not have advanced technological infrastructure.

Data protection and privacy

- Transparent data protection policies. Inform teachers, students and parents about what data is collected and how it is used by AI. Selection of tools that adhere to GDPR (General Data Protection Regulation) standards and offer data anonymization options.
- Limiting surveillance. Re-evaluation of proctoring tools so that they do not violate students' privacy. Use alternative assessment methods based on project-based learning and collaborative activities instead of dedicated AI surveillance.
- Use techniques such as differential privacy to prevent students' identities from being revealed.
- Collect only necessary data (e.g., avoid recording emotional reactions without consent).
- Automatic deletion of data after the end of the school year.

Tackling disinformation and unreliable information

- Teaching critical thinking and digital literacy. Training students in critically evaluating the information provided by AI. Organization of laboratories to detect false or unreliable data from AI systems.
- Human control over content production. Encourage teachers to use AI as a support tool, but not as an absolute source of knowledge. Combining AI tools with scientifically approved sources and citations to academic data.

Protecting the role of the teacher and the human relationship

- Human presence and supervision. AI should not replace the teacher, but should be used as an auxiliary tool. Teachers can use AI for personalised learning, but remain the main vectors for guiding and assessing students.
- Balanced use of AI in the classroom. Set clear rules for when and how AI can be used in work and education. Apply learning methods that prioritize human interaction, such as Group work, discussions, and interactive games.
- Seminars for teachers on AI ethics, bias detection and data management.

Preparing students for the world of AI

- Teaching the principles of AI in schools. Create courses that explain how AI works, what its limitations are, and what are the ethical issues that accompany it. Promote the development of skills such as programming, data analysis and understanding of algorithms.
- Cultivation of ethical thinking and responsibility. Organize classroom discussions about the ethical dilemmas of AI. Encourage students to think about how they can use AI responsibly in their personal and professional lives.
- Students as "digital citizens". Integrating courses on data rights, critical thinking and AI risks into curricula. Example: Workshops where students analyze how social media algorithms affect their learning.

Development of ethical frameworks and regulations

- National/international regulations: Mandatory compliance with rules such as GDPR to collect student data.
- Create national guidelines on the use of AI in education (e.g., ban on the use of biometric data on children without consent).
- Ethics committees. Schools and universities create ethics committees with teachers, parents and AI experts to evaluate tools before adoption.

Explainable AI (XAI):

- Use AI models that can explain why and how they made a decision (e.g., job scoring).
- Open platforms.
- Public documentation of algorithms for teachers and students to understand their function. Example: A platform that shows what criteria it used to recommend specific training materials.

Tackling prejudices and inequalities

- Training AI models with multicultural and representative data to avoid stereotypes (e.g., balanced gender/gender representation in examples).
- Regularly test algorithms for bias with tools like IBM's AI Fairness 360.
- Public budget to provide free AI tools to schools in weak areas.

Human-centered systems design

- Use AI to automate administrative tasks (e.g., grading tests) so teachers focus on teaching and personal contact.
- Ability for teachers to cancel or modify AI suggestions (e.g., change AI-generated annotation in an assignment).

Social participation and dialogue

- Advisory boards with parents and students.
- Public consultations before the introduction of new technologies.
- Prefer open-source platforms (e.g., Moodle with AI plugins) over private companies, for freedom and transparency.

Continuous flow evaluation and improvement

- Studies of the impact of AI on the psychology and academic performance of students.
- Update regulations according to technological developments (e.g., dealing with deepfakes in educational materials).

Application examples

- Custom learning platform with control: Using a system like Knewton that customizes content, but with the ability for students and teachers to choose what data they share.
- Free AI tutors for everyone: Government programs like Duolingo for schools, with access to students at no cost.

- AI ethics in universities: Course "AI Ethics in Education" at MIT or Stanford as a model for other institutions.



Activity 55. Group work. Create an infographic that presents the five main pillars for the ethical use of AI in education. The infographic should use examples that clarify each principle and be designed to explain the concept to parents and teachers. Evaluation criteria: completeness and clarity of content, creativity, aesthetics and originality.



Activity 56. Group work. Create a short video that explains to students and parents the importance of ethical use of AI in education and provides practical advice to empower them in this area. Evaluation criteria: accuracy in the information presented, creativity, aesthetics and originality of the video.

Examples of applying AI in the classroom in an ethical and pedagogical way

Below are practical examples of how AI can be used in education in a way that promotes learning without creating inequalities, violating privacy or underestimating the importance of the teacher.

Using AI as an assistive learning tool

Example: Create custom exercises. Teachers can use AI tools, such as ChatGPT, to create personalized exercises based on each student's level. If a student struggles with grammar, AI can suggest targeted exercises for them.

Ethical dimension

Students do not receive the same ready-made answers, but exercises tailored to their needs, avoiding excessive automation of learning.

Development of critical thinking and digital literacy

Example: "Discover false content." The teacher gives students two answers from AI: one right and one wrong. Students are asked to identify which is correct, using criteria such as reliability of sources.

Ethical dimension

Students understand that AI is not always foolproof and learn to evaluate information before accepting it as truth.

Human interaction and creativity

Example: "Combinatorial storywriting". Students use AI to give them ideas for a story, but they themselves write the main part of the narrative. The teacher encourages them to add personal details, feelings and dialogues.

Ethical dimension

AI acts as an inspiration, not a replacement, for students' creativity.

Responsible use of AI for research and reporting

Example: "Verification of information". Students use AI to search for information about a topic. Next, they need to find at least two reliable sources that confirm or correct AI's response.

Ethical dimension

Students learn that AI is not a substitute for academic research and must rely on reliable sources.

Protection of privacy and human oversight

Example: "Talking about AI in everyday life". Students are divided into groups and analyze scenarios, such as: Is it right for cameras with AI to monitor the classroom? Should students use tools like ChatGPT for their assignments? Each group supports a position and then there is an open discussion.

Ethical dimension

Students develop moral awareness around the use of AI and actively participate in dialogue.

Development of programming skills and understanding of algorithms

Example: "Learn how AI thinks." Students use a simple AI model training tool (e.g. Google's Teachable Machine). They train a model to recognize colors or sounds and observe how it learns. They discuss how the data we give AI affects its outcomes.

Ethical dimension

Students understand that AI is not magical, but depends on how it has been trained.

Balanced use of AI in assessment

Example: "Combining AI and human assessment". The teacher uses an AI tool to correct exercises, but always checks the answers before giving the final grade. Students can use AI for feedback on their reports, but they have to make the final corrections themselves.

Ethical dimension

AI helps with correction, but it does not replace human judgment and students' critical thinking.

Adapted, teacher-controlled learning

Example: Platforms such as DreamBox (math) or Khan Academy with AI, which tailor the exercises to each student's level.

Ethical dimension

The teacher checks and modifies the AI sentences.

Student data is only readable by the school (not commercial use).

Pedagogical benefit: Supporting students with different learning speeds without stigma of "weak" or "strong".

Automatic scoring with human review capability

Example: Tools like Gradescope, which score tests with AI but allow the teacher to correct mistakes or take context into account (e.g., dyslexia).

Ethical dimension

Students can dispute the score through the teacher.

Use gender/race bias-free algorithms

Pedagogical benefit: Free time for teachers to devote time to creative activities.

Multicultural language learning

Example: Apps like Duolingo with AI that teach languages, adapting exercises to a local cultural context (e.g., stories with characters from different countries).

Ethical dimension

Training the model in multicultural data to avoid stereotypes.

Pedagogical benefit

Promotion of cultural awareness and integration.

Support for students with special needs

Example: Speech-to-Text Tools (e.g., Google Live Transcribe) for students with hearing disorders.

AI-powered Attention System that informs the teacher if a student with ADHD loses concentration, without "labeling" them publicly.

Ethical dimension

Data collection only with parent/student consent.

Pedagogical benefit

Equal access to learning without discrimination.

Creative Interaction with AI for critical thinking

Example: ChatGPT for discussing philosophical topics: Students formulate questions and analyze AI answers with teacher guidance.

AI games (e.g., AI Dungeon) to create stories and develop reflection.

Ethical dimension

Spreading the idea that AI is not absolute truth and can make mistakes.

Pedagogical benefit

Training in critical analysis of sources and ethical use of technology.

Anonymous sentiment analysis for socio-emotional support

Example: Tools such as GoGuardian (for published content only) that anonymously analyse students' emotions in class (e.g., through written responses). The teacher takes collective data (e.g., "30% of the class seems stressed") to adjust teaching.

Ethical dimension

Prohibition of recording personal information.

Pedagogical benefit

Creating a safe psychological environment.

Training for AI ethics in the classroom

Example: AI robotics labs: Students program robots to solve ethical dilemmas (e.g., "How to choose an autonomous vehicle between two hazards?").

Deepfakes analysis: Courses where students learn to recognize AI-generated content and discuss social impacts.

Ethical dimension

Encourage discussion of responsibility and bias in AI.

Secure collaboration platforms

Example: Microsoft Teams with AI for Group Tasks: The system suggests resources or organizes tasks, but students control what data they share.

Pedagogical benefit

Enhancing collaborative learning while respecting privacy.

Critical principles for all applications

Transparency: Students and parents know what data is collected and how it is used.

Option: Ability to opt out of specific AI features.

Human stewardship: The teacher remains the final recipient of decisions.

Dignity: No comparisons or "grading" of students on public boards.

Conclusion

AI can transform the classroom into a space of creativity, accessibility and critical thinking, as long as it is applied with respect for human dignity and support for pedagogical purpose. The role of the teacher remains indispensable, as a mentor, moral guide and guardian of equality. So instead of fighting the use of AI, we can integrate it into education in a way that:

- Boosts creativity and critical thinking
- Teaches responsible use and transparency
- Ensures the authenticity of the work
- Develops critical thinking and creativity skills
- Protects students' privacy
- Strengthens the role of the teacher
- Teaches students how to use AI responsibly

Addressing students' use of AI for assignments and exercises

The use of AI by students to produce assignments and solve exercises poses challenges, as it can lead to copying, lack of critical thinking and inequalities in assessment. However, it is neither realistic nor productive to ban its use altogether. Instead, a strategy that promotes the ethical and creative use of AI should be adopted. Below, here are some practical ways to address this problem.

Definition of rules and guidelines

AI-use contract. At the beginning of the school year, talk to students and create a code of conduct for the use of AI. Explain that AI can be used as a help tool, but not as a means of plagiarism.

Example rules

- It is allowed to use AI for ideas, structure or feedback.
- It is not allowed to fully copy answers from AI without personal editing.
- Students are required to report when and how they used AI in their assignments.

Result

Students understand that AI is a tool to help them, not a substitute for their thinking.

Customize how tasks are assigned

Interactive tasks with human participation. Ask students to write an essay, but with an oral presentation, or to support their text with arguments in a discussion. Deliver tasks that require personal analysis, creativity and a combination of knowledge. Use questions like:

- "How does this affect your life?"
- "What would you do differently if you had to rewrite this answer without help from AI?"
- "Compare the information AI gave you with other sources"

Result

Tasks become more personal, making it harder to use AI as a unique production tool.

Training in the proper use of AI

AI Critical Analysis Laboratory. Give students an answer from AI and ask them to analyze, correct or improve it. Encourage students to compare the AI response with other sources and identify possible errors or shortcomings. Encourage students to use AI for inspiration, but not for copying.

Result

Students become aware of the limitations of AI and learn to use it as a tool for critical thinking.

Attribution of sources when using AI

Ask students to include a reflection paragraph on how they used AI and how it affected their thinking. Incorporate correct AI reporting into the context of schoolwork. Example of a report reference:

- "I used ChatGPT to generate ideas about my topic, but I formatted the final text based on my own analysis."

Result

Students learn to be transparent and responsible for the use of AI.

Use of anti-plagiarism strategies

Oral exams and live text production. For important tasks, incorporate an oral assessment item. Organize activities where students write in class, without access to AI. Ask students to develop the same topic twice: once using AI and once without. Discuss the differences.

Result

Students develop real writing and comprehension skills, rather than depending on AI.

Create activities that use AI creatively

Ask students to use AI to create questions on a text they read, not just find the answers. Give them an answer from AI and ask them to elaborate and enrich it with their own examples and personal thoughts. Instead of simple copying, ask them to identify errors or weaknesses in AI responses.

Result

Students develop critical thinking skills and learn to use AI as a supporting tool.

Enhancing authentic evaluation

Use project-based learning, where students need to apply their knowledge to real-world problems. Instead of classic essays, ask students to present their topic in multimodal formats, such as:

- Infographics
- Videos or podcasts
- Interactive presentations

Result

Students cannot simply copy from AI, as they have to create, apply and present knowledge in a personal way.



Examples of educational use of Artificial Intelligence

Prompting techniques for teachers

As mentioned, the prompting technique refers to formulating instructions to the AI to produce the desired response. Teachers can use prompting to create learning materials, personalize learning and enhance students' creative thinking. Prompting is a powerful tool for teachers who want to use AI to teach, adapt content and develop students' critical and creative thinking. With well-crafted prompts, AI can become a valuable classroom assistant.

Basic principles of prompting for teachers

- Clarity and specific instructions. Use clear and immediately understandable language. Instead of "Create an English lesson", prefer "Create an English lesson for B1 students, focusing on the vocabulary of the trip".
- Structured prompts. Use the Role → Action → Constraints → Goal structure. For example, "You are an English teacher who creates interactive exercises. Make a quiz with 5 multiple-choice questions for Past Perfect, with 3 answers per question and explanation for each mistake."
- Give examples. If you want a specific style or type of exercise, give a sample. For example, "Write a 100-word story for 10-year-old students, similar to this: [...]"
- Use steps and constraints. Instead of general instructions, ask for specific steps. For example, "Teach the passive in three simple steps, giving examples at a time."

Prompting applications in education

Creation of educational material.

- Course planning. Prompt: "Create a lesson plan for 45 minutes on Simple Past, with introduction, main activity and revision exercise."
- Create tasks and exercises. Prompt: "Make 5 open-ended reading comprehension questions, suitable for third grade students."
- Differentiated Instruction. Prompt: "Provide three versions of a vocabulary exercise for beginners, intermediate and advanced learners."

Supporting creative thinking

- Create stories. Prompt: "Write a short 50-word story about a student finding a magic book. Use 5 words related to travel."
- Brainstorming ideas. Prompt: "Give me 5 ideas for fun English learning games for young learners."

Evaluation and feedback

- Create evaluation criteria. Prompt: "Make a list of evaluation criteria for an oral presentation in class."
- Provide constructive feedback. Prompt: "Give a polite and helpful feedback to a student who made a mistake in the following answer: [...]" *

Facilitation of teaching and collaboration

- Create roles for discussions. Prompt: "Write a dialogue between two students discussing what they will do over the weekend, using Future Simple."
- Design critical thinking strategies. Prompt: "Give me an activity to help students analyze the arguments of an article."

Prompting practice activities

For teachers

Activity 1

Improve the following prompts to be more specific and effective.

"Write an activity for an English lesson".

"Give me a grammar quiz."

"Help me organize a class."

Improvement ideas

"Create an English activity for A2 level learners, focusing on Past Simple, with a gap-filling exercise and an oral practice exercise."

"Make a quiz of 5 multiple-choice questions for Present Perfect, with explanations of each answer."

"Suggest 3 strategies for classroom management in a classroom with 25 elementary students, with an emphasis on positive reinforcement."

Activity 2

Create a structured prompt, using the format: Role → Action → Constraints → Goal.

Initial prompt

"Write a lesson about the history of Ancient Greece".

Structured prompt

"You are a history teacher and you plan a 45-minute lesson for high school students. He created a course on Ancient Greece, focusing on the Democracy of Athens. Divide it into three parts: introduction (10 minutes), main activity (25 minutes), and repetitive exercise (10 minutes). The main activity should be interactive."

Activity 3

Create a prompt that will create an exercise for your students, then customize it for three different groups of students:

Beginners (e.g. A1-A2)

Medium (e.g. B1-B2)

Advanced (e.g. C1-C2)

Example

"Write a writing exercise for an English lesson".

A1: "Write 5 sentences about what you do each day, using Present Simple".

B1: "Write a 100-word email to invite a friend on a trip."

C1: "Write a 250-word article on the importance of technology in modern education."

Activity 4

Customize a prompt for students with dyslexia, ADHD or other learning needs,

Example

"Write an activity for learning new vocabulary."

Adaptation for a student with dyslexia

"Create a visualized vocabulary learning activity with pictures and audio cues. Use OpenDyslexic font and phrases in simple structure."

Activity 5

Use AI to create lists of ideas for an educational topic. Improve the initial prompt to achieve better results.

Example

"Give me 5 fun activities to teach verbs in English to elementary school students."

Activity 6

Create a prompt that will produce a dialogue or story appropriate for your students' age.

Example

"Write a short 6-sentence dialogue between two friends discussing their favorite hobby, using Present Simple."

Activity 7

Create a prompt that will help students delve deeper into a particular concept or topic.

Example

"He explained the concept of philotimo."

Structured prompt

"You are a teacher and you want to explain the concept of 'philotimo' to high school students. Give a simple and understandable explanation, including two examples from everyday life illustrating this concept."

Activity 8

Use AI to design collaborative activities between students.

Example

"Give me ideas for group activities."

Structured prompt

"She created three group activities for primary school students that encourage collaboration and creativity. One activity should involve the use of technology, the other should be about nature and the third should be about music."

Activity 9

Create a prompt that will support language development through text analysis.

Example

"Analyze a text."

Structured prompt

"You are an English teacher and you ask your students to analyze a short text of 200 words. Ask them to identify the main points and comment on the language used, as well as their impressions on the subject."

Activity 10

Customize a prompt for teaching social skills or emotional intelligence.

Example

"Write about friendship."

Structured prompt

"Create an activity to teach friendship to elementary school students. Include 2-3 scenarios where students should discuss how they would react to different friendship situations and suggest ways to resolve conflicts."

For students

Activity 1

Design a prompt that will ask students to develop critical thinking about a topic.

Example

"Write a view on technology in education."

Structured prompt

"You are a high school student and you are asked to write a 300-word report on the impact of technology on education. Present both the pros and cons of technology in the educational process and support your point of view with examples."

Activity 2

Create a prompt that encourages creativity through art or writing.

Example

"Write a story."

Structured prompt

"You're a writer and you want to write a fantastic 500-word story about a hero who discovers a hidden world. Use descriptions to bring the characters and environment to life."

Activity 3

Create a prompt that will promote research and discovery.

Example

"Write about a famous personality."

Structured prompt

"You are a researcher and you have to write a 400-word report on Marie Curie's life and work. She focused on her achievements in science and her contribution to society, using at least three reliable sources."

Activity 4

Create a prompt that will ask students to compare and contrast two concepts or personalities.

Example

"Write a comparison between two historical figures."

Structured prompt

"You are a historian and you have to write a 500-word comparison between Aristotle and Plato. He analyzed their philosophical views and how they influence contemporary thought."

Activity 5

Create a prompt that encourages students to use social media for educational purposes.

Example

"He created a post for social media."

Structured prompt

"You're a high school student and you need to create an Instagram post that promotes recycling. Use a picture and write a 100-word text that encourages your friends to take action."

Activity 6

Create a prompt that will ask students to design a survey or experiment.

Example

"Write about an experiment."

Structured prompt

"You're a scientist planning an experiment to examine the effect of light on plant growth. Describe the process of the experiment, the materials you will use and the expected observations."

Activity 7

Customize a prompt for teaching presentation skills.

Example

"Write a presentation on a topic."

Structured prompt

"You're a high school student and you're asked to give a 10-minute presentation on the effects of climate change. He created a presentation structure that includes an introduction, a main part with three main areas, and a conclusion, using visual elements."

Activity 8

Use AI to develop exam preparation strategies.

Example

"Give me tips to prepare for the exam."

Structured prompt

"You are a student and you want to prepare for the exams. Create a list of 5 strategies to follow, including time management techniques and healthy eating."

Activity 9

Create a prompt that will ask students to analyze the language and style of a text.

Example

"Write an analysis of a poem."

Structured prompt

"You are a literary analyst and you are asked to write a 300-word analysis of the poem 'I Romiosini' by Yiannis Ritsos. He focused on the language, symbols and style of the poem, as well as its significance in the Greek literary landscape."

Activity 10

Create a prompt that will ask students to express their personal opinions on a social issue.

Example

"Write about a social issue."

Structured prompt: "You are a high school student and you are asked to write a 400-word report on gender equality. Present your point of view, support it with examples from everyday life and mention suggestions for improving the situation."



Activity 57. Individual work. Enhance, extend and adapt all of the above examples to your own needs.

Use of Artificial Intelligence to produce lesson plans

The use of AI to create lesson plans in education is part of a modern and effective way of utilizing technology to support educational processes. The context of using this feature can be broken down into several dimensions, which include personalizing teaching, enhancing the quality of lesson plans, facilitating teacher preparation, and multidimensional content management.

First, through the adaptability offered by AI, it becomes possible to create lesson plans that meet students' individual needs and abilities. AI can analyze data about students' cognitive progress, interests or even learning style, and suggest tailored teaching strategies. This enhances the individualization of education, which is considered critical for the development of learning outcomes.

Second, AI offers the possibility of creating high-quality lesson plans, leveraging information from published educational materials, research studies and pedagogical guides. Using this data, lesson plans can be science-based, include strategies that have proven effective, and combine multidimensional teaching approaches covering a variety of educational objectives.

Third, AI helps reduce the time it takes for teachers to prepare by allowing them to focus more on implementing the lesson plan and interacting with students. Instead of spending hours searching for materials or writing detailed drawings, teachers can make use of the proposed structure and content created by AI, which they can modify and adapt if they wish.

In addition, AI can act as a content management tool, allowing teachers to organize the information related to their lessons on a large scale. Through techniques of categorization, analysis and perhaps even multimedia creation, it can provide material that supports structural and multidimensional lesson plans that combine lectures, audiovisual media and activities.

In conclusion, using AI to create lesson plans promotes education at a more effective, personalized and collaborative level. At the same time, the quality of teaching is enhanced and time is saved, leaving teachers to focus on the essential part of education, interaction with students. The use of artificial intelligence in this context does not replace the human-educator, but works supportively, strengthening existing educational practices and making them more efficient and flexible.

Practical advice

The success of the use of AI depends to a large extent on the quality and clarity of the prompts. The prompts must be clear, specific and include all the necessary information to enable the AI to respond accurately. In addition, it is useful to provide appropriate context regarding the purpose of the lesson, the level of the students and the educational objectives.

Specifically

- **Setting a specific goal:** It is important to clarify exactly what you want to achieve with the course, such as "teaching basic geometry concepts". The undefined purpose often leads to impractical or inadequate results.
- **Provide context:** Explicitly mention the level of the students, such as "high school students", or the expected duration of the lesson, e.g. "45 minutes". This information helps the algorithm tailor the response to your needs.
- **Justification of choices:** It is useful to ask the AI to justify the structure of the plan or suggest alternative approaches. This allows the teacher to have a fuller understanding and adapt the drawing to the particular circumstances of the classroom.

Examples of good prompts

- He created a 45-minute lesson plan for 20 high school students, on "The causes and effects of the Industrial Revolution". The lesson should include an introduction, a group activity and a short discussion. Emphasize understanding social and economic aspects.

- Please provide a 60-minute lesson plan for third grade students on nutrition. It included an interactive activity to distinguish healthy and unhealthy foods and a creative homework that enhances the practice of knowledge.

Examples of bad prompts

- Make a lesson plan for teaching literature. Problem: The prompt is too general and does not specify the level of the students, the subject matter or the intended goal.
- Give me an idea for a lesson. Problem: The prompt is too vague, as it does not provide sufficient context to produce something specific.
- Make something creative and fun. Problem: Although it provides positive directions, the prompt lacks detail and goals.

Critical evaluation of the exit

Although AI is extremely effective in providing suggestions, teachers bear the ultimate responsibility for evaluating the quality and functionality of the outcome. Make sure that the proposed plan:

- It is aligned with the curriculum.
- It includes activities that suit the level of the students.
- It is realistically practicable within the proposed time limit.

Example in practice

Prompt

He proposed a detailed lesson plan for sixth grade students in the Geography lesson, in the chapter The continent of Asia [insert text]. Create learning objectives that will include understanding the geographical features of Asia (such as mountains, lakes, rivers). Define the teaching stages that will include duration, content, presentation, group work, map creation and any other activity you find useful. He identified the method of assessment using a test to identify the characteristics of Asia.

Result (the text configuration of the ChatGPT response has been retained)

Detailed Lesson Plan - Geography in the sixth grade: The Continent of Asia

Learning Objectives

Upon completion of the course, students will be able to:

1. Recognize the main geographical features of Asia (mountains, rivers, lakes, plains).
2. Describe the geophysical formation of Asia and explain its importance in the lives of peoples (e.g., climate, water, crops).
3. Develop mapping skills by capturing the main geographical features of Asia.
4. Work collaboratively and exchange ideas through group activities.
5. Assess their knowledge of Asia through structured evaluation methods.

Teaching Stages

1. Preparation and Introduction (10 minutes)

- Launch Activity (5 minutes): Use projectors and interactive map to illustrate the vast expanse of Asia. Students answer questions such as "Which countries do you know in Asia?" or "What do you think is typical for Asia?"

- Objective: Arouse interest and report on previous knowledge.

- Introductory Presentation (5 minutes): The teacher uses a short PowerPoint presentation with pictures and basic information, covering Asia's geographical location, its natural diversity and its importance worldwide.

2. Main Teaching (20 minutes)

Topics covered:

i. Main geographical features:

- The Himalayas (as the highest mountain range in the world).
- The major rivers (e.g. Ganges, Yangtze, Euphrates-Tigris).
- Lakes such as the Caspian and Aral Seas.
- The deserts (e.g. Gobi) and the Great Plains of Siberia.

Teaching Method:

- Use of digital map with 3D projection to determine geographical features in real time.
- Discuss the importance of these characteristics in human activities (e.g., water sources, crops, trade).

3. Working in Groups (15 minutes)

- Students are divided into groups of 4-5 people. Each group assumes a specific characteristic of Asia (mountains, rivers, lakes, deserts, etc.).
- Activity:
 - Use of question cards, which direct groups to locate geographical features on the class map.
 - Creation of their own map on cardboard, where they will identify and draw the characteristics they undertook.

Presentation:

- Each group presents its results within 2 minutes.

4. Creative Activity: Create a Map (10 minutes)

- Students participate individually in an interactive game in geography software (e.g. Google Earth or an educational app), where they are asked to identify default features.
- Part of the exercise involves tagging the digital map and saving it as a file for personal evaluation.

5. Closing and Drawing Conclusions (5 minutes)

- Feedback from students: What did they find interesting? What did they first meet?
- The teacher concludes with a recap through interactive questions (e.g., "What is the longest mountain in Asia?", "Which river is the longest?").

Review

- Recognition Test (30 minutes):
 - Closed-ended questions (multiple choice, true/false) to identify key characteristics (e.g. "Iran is on the continent of Asia – True or False?").
 - Exercise with a map of Asia where students are asked to name and locate 5 geographical features (e.g. the Yangtze River, the Himalayas).
- Group Work Examination:
 - Evaluation of group maps created by students, based on accuracy and visual presentation.
- Self-assessment:
 - Questionnaire, where students assess their understanding and participation in the course.

Materials and Media

- Maps (digital and printed)
- Computers/tablets for software use.
- Cardboard, markers, and craft materials to create physical maps.
- PowerPoint for the presentation.

This project aims at participatory and multidimensional learning, focusing on enhancing understanding through interactivity and collaboration. In this way, students not only acquire knowledge about the continent of Asia but also develop teamwork, thinking and cartographic perception skills.

Prompt

Suggested improvements to the previous lesson plan

Result (the text configuration of the ChatGPT response has been retained)

The proposed lesson plan for the "Continent of Asia" presents a remarkable and structured approach to teaching. Below are proposed specific improvements and further enrichment of the plan to enhance its effectiveness, based on modern pedagogical approaches and the use of technology.

1. Strengthening Learning Objectives

The learning objectives are clear, however there is room for further refinement and inclusion of higher levels of thinking than the revised Bloom taxonomy. For instance:

- New Objective: To compare and analyze the geographical characteristics of Asia with other continents, focusing on common points and differences.
- New Objective: To assess the relationship between geographical features and human development in specific regions of Asia.

These additions will enhance the skill of critical thinking and analysis, motivating more active participation.

2. Utilization of an interdisciplinary approach

The concept of interdisciplinarity strengthens the connection of Geography with other disciplines. It is proposed to incorporate elements such as:

- History: Identification of historical events influenced by geographical factors, such as trade through the Silk Road.
- Sciences: Investigation of the role of natural disasters (e.g., earthquakes or monsoons) in the Asian region and the correlation with geophysical structure.
- Technology: Use of geological applications and tools, such as monitoring seismic activities through online seismographic maps.

3. Interaction and Motivation through Inquiry-Based Learning

To create a more proactive didactic approach, it is proposed to enhance inquiry-based learning. For instance:

- Exploration Scenario: "You are part of a research team traveling from the Himalayas to Siberia. List the geographical challenges and advantages you'll face at each stage of the journey."

This method gives students the opportunity to reflect and learn through the problem-solving process.

4. Improvement of main teaching through integration of technological tools

The existing use of interactive maps and PowerPoint is effective, but can be enhanced with the use of advanced tools. Specifically:

- Recommended: Using applications such as ArcGIS Online or Google Earth Studio, which allow dynamic presentations with real-time geographic data.
- Addition of Augmented Reality (AR) Tools: Students could "explore" the Himalayas, the deserts of Asia or the largest rivers through AR applications, increasing their experiential engagement.

5. Enhancing Differentiated Learning

In order for all students to achieve their learning objectives, regardless of their learning profile, differentiation is proposed as follows:

- Visual Materials: Greater use of videos and interactive presentations for visual learning students.
- Audio Materials: Include podcasts or audio narrations, such as the story of celebrities expeditions to the Himalayas, for auditory learning students.
- Kinetic Activities: Creation of three-dimensional models of mountains and rivers of Asia, for students who prefer practical activities.

6. Upgrading Teamwork

The activity of mapping is interesting, but it can evolve. Proposed:

- Interactive Games: Each team can play the role of international journalists writing articles about different regions of Asia, presenting the impact of climate and geography on local communities.
- Reflection Work: Each group is asked to propose a sustainable action plan for a specific Asian environmental challenge (e.g., drought in India, warming in the Arctic).

7. Dynamic Evaluation and Feedback

This evaluation is sufficient, but can be reinforced by more interactive and reflective activities:

- Digital Quizzes: Create digital quizzes (e.g., Kahoot, Quizizz) at the end of the course for rapid and meaningful assessment.

- Predefined Assessment Stations: Gradual assessment through small activities, e.g., location identification on a digital map, to measure real-time comprehension.
- Open Reflective Question: "In your opinion, in which geographical area of Asia would you like to live and why? Please explain based on geographical features."

8. Further Enrichment of the Closing Course

Closing can be made more dynamic and inspiring:

- Interactive Summary: Create an interactive brainstorming on the whiteboard, where each student contributes a feature they learned about Asia.
- Long-term Inspiration: Encourage students to seek out more about Asia through books, documentaries or scientific resources.

Conclusion

By implementing the above suggestions, the lesson plan can become more holistic, interactive and innovative, enhancing students' self-motivation and the development of critical thinking.



Activity 58. Individual work. Enhance, extend and adapt all of the above examples to your own needs.

Use of Artificial Intelligence to produce exercises, activities, and tests

Integrating AI into assessment processes creates a structured and efficient framework that enhances the learning experience, fosters innovation and streamlines design and evaluation processes.

The AI implementation framework focuses on the following key points:

- Primarily, AI can facilitate the creation of personalized tests based on students' needs and abilities. Such a system has the ability to analyze each student's performance data, such as previous test scores, learning preferences, or even specific areas of weakness. Based on this analysis, AI can design exercises and tests that meet the personal needs of each student, promoting more effective and targeted learning. At the same time, it can ensure that students progress at a pace adapted to their abilities, thus avoiding uneven progress.
- In addition, AI offers the possibility of automated and unbiased assessment. In traditional educational practice, evaluation often depends on subjective factors, such as fatigue or unconscious biases of teachers. Through AI, assessment becomes objective, freeing up time for teachers to focus on supporting their students. The AI system can score tests accurately and quickly, whether they include multiple-choice questions or even more complex formats such as analytical reports or mathematical solutions.
- Third, AI systems can provide direct and adaptive feedback to students. Providing real-time feedback enhances the learning process as it allows students to immediately understand their mistakes and correct their weaknesses. This not only maximizes the process of understanding and consolidating knowledge, but also enhances continuous learning, as students remain active participants in their own development.
- A further advantage is that AI can be used to analyze long-term performance trends. Through data collection and analysis, teachers can access valuable information on how the learning process is progressing at individual, group and/or class level. It can identify patterns and issues that are not easily perceived through traditional teaching, thus enabling early interventions.
- It is also important that AI can promote the development of analytical and problem-solving skills in students. Creating simulation scenarios or using custom quizzes based on real-world problems allows the integration of theory and practice and develops students' critical thinking and autonomy.
- At the administrative level, integrating AI into the educational process drastically reduces the time and human resources required to design, develop and analyze tests. This advantage is particularly evident in education systems with large numbers of students, where the traditional assessment method can be time-consuming and often limited by management barriers.

Despite the benefits, careful planning and ethical testing are required to effectively integrate AI into the educational process. Issues such as data protection, transparency in assessment and the need to ensure fair access must be taken into account in order to realise the full potential of technology without creating inequalities.

Practical advice

- Define the topic and goal very clearly. Start by describing in detail the level of the students, the subject, and the type of material you want (e.g., comprehension exercises, multiple choice questions, problem-solving scenarios).
- Clearly define what the aim of the test is. For example, if it is a question of assessing knowledge on a particular topic or developing critical thinking, this intention must be reflected in the prompt.
- Give context. Instead of writing general and vague requests, provide specific information about the content or skills you want students to leverage.
- Identify the content. Especially if you need tests on specific sections (e.g. history of the Middle Ages, basic algebraic relations), state this clearly.
- Use clear language. The formulation of exhortations should use clear and simple language, to avoid any confusion in the "intelligence" of the system.
- Adjust the tone and difficulty. Adjust your commands according to the cognitive level, for example Elementary, Middle or High School.
- Ask for examples and editing. Ask the AI to provide examples so that you can assess the quality of the material before proceeding with further use.

- Provide adequate context. Explain in detail to AI the type of questions you want (e.g. multiple choice, open-ended, matches) and the degree of difficulty you want, as well as the academic grade for which the test is intended. The context must be complete so that AI can deliver accurate results.
- Check the output produced. It is important to evaluate the questions that AI generates to ensure that they are accurate, within the scope of the topic and appropriate to the intended level of learning.

Examples of good prompts

- He created five reading comprehension exercises for high school students based on the subject area of the Greek Revolution of 1821. The exercises should include open-ended questions, which enhance critical thinking.
- He constructed a 20-question exam for sixth grade students on the four basic arithmetic operations. Divide the questions into three levels of difficulty: easy, moderate, and difficult.
- Create practice activities in the pronouns of the Greek language for B' Gymnasium students. Include examples of use and two short multiple-choice exercises.
- He created a math test for high school students in the chapter of Geometry. The test should include 5 multiple-choice questions, 2 open-ended questions, and one written proof exercise. The difficulty should be medium to high and the language should be understandable for students of this level. The call to action provides clear guidance and adequate context. It includes a defined topic, type of questions, number of people required, student level, and recommended degree of difficulty.

Examples of bad prompts

- Give some comprehension exercises. The request is very general and does not describe the topic, level or type of exercises.
- Write activities for students. Incomplete, as the object, level or objective is not mentioned.
- Make some questions for an exam. The prompt is vague and general. It does not specify the topic or scope of the questions, nor the level of students, nor the type of questions required.

Below are training scenarios where AI can be used to produce exercises, activities and tests.

Learning vocabulary through interactive exercises

- Create a list of activities for students to practice the new vocabulary taught, including matching, gap-filling and sentence composition."
- Production of exercises that include discussion questions that practice the use of vocabulary in everyday life.

Investigation of historical events through timelines

- Create activities involving the creation of timelines with important historical events.
- He designed questions where students connect events to their impact on society then and now.

Understand text through visualizations

- Design activities that involve creating a conceptual map for the content of the text.
- He suggested exercises that push students to find connections between different parts of the narrative.

Math puzzles and logic problems

- It created logic problems that enhance the understanding of geometric concepts.
- Write puzzles based on mathematical functions and equations.

Cross-curricular data analysis work

- Create activities for data analysis that include graphs and tables.
- He suggested cases for data collection that the student can analyze.

Recap Questions

- He created 10 multiple-choice questions for the course 'The Revolution of 1821', focusing on key events.

Concept maps

- He created a conceptual map of ecosystems and their interactions.

Create practical examples

- Here are 5 examples of the use of geometry in architecture.

Error recognition exercises

- Create text with 5 grammar errors in the present tense.

Virtual dialogues

- It created a dialogue between two scientists on Climate Change.

Thematic reflections

- He formulated 3 questions for discussion on Democracy in Ancient Greece.

Case Study

- He created a scenario for life in a moneyless society.

Data representation

- He provided diagrams showing the flow of energy in ecosystems.

Self-esteem activities

- Give 5 questions to evaluate what I learned about ancient civilizations.

Artistic activities

- He created painting activities for the seasons of the year.

Knowledge Games

- He created 20 questions about physics at the high school level that can become quiz games.

Hypothetical interviews

- Write an interview a student would do with Einstein about relativity.

Discovery activities

- He proposed material for research work on renewable energy.

Composition and creation of texts

- He created a title and introduction for an article about the importance of artificial intelligence.

Create complementary vocabulary exercises

- Create 10 sentences with gaps where students have to fill in the correct word from the vocabulary of unit X.
- Make 5 word-matching exercises with definitions from the list: [...].
- Write 7 sentences where a word appears anagram and students need to correct it.

Create stories using the new grammar

- He created a short history of 100 words that includes 5 instances of time X.
- Write an unfinished story with the new grammatical structure and ask the students to complete it.
- Create 3 alternative sentences for each phrase of the story using different grammatical structures.

Enhancing students' communication ability

- Create a dialogue between two people using the new grammatical structure.
- Write down 5 questions a student can ask in a discussion based on unit X.
- Add 3 alternative answers for each question in the dialogue.

Crossword puzzles for terminology

- Create a 10-word crossword puzzle with their definitions from section X.
- Add an additional activity where students have to use 5 of the words in sentences.

Match sentences to images

- Create 10 sentences related to topic X and 10 corresponding images to match.
- Make an exercise where students have to choose the right picture for each description.
- Add an activity where students will describe in their own words what the pictures show.

Development of interactive capacity

- Create a dialogue between two people with 5 gaps that students need to fill.
- Add alternative answers to the gaps so students can choose the right one.
- Create an additional activity where students write their own dialogue using the same structures.

Proposal reordering activities

- Write 10 sentences related to topic X and mix up the order of their words.
- Create an activity where students place words correctly to form a sentence.
- Add 3 difficult cases where there can be different correct answers.

Create stories through keywords

- Create a list of 10 words from lesson X and ask students to write a story containing them.
- Make a variation where students should use the words in a specific order.
- Add an additional exercise where students will exchange stories and identify keywords in their classmates' stories.

Create short comics with dialogue

- He created a 4-frame comic with characters discussing topic X, leaving gaps in the "balloons" for students to fill in.
- Add 3 examples of dialogues that students can use as a model.
- Create an activity where students have to create their own comic based on a given situation.

Listen and fill in text

- Create a 1-2 minute audio clip on topic X and a gap-filling exercise based on the content of the passage.
- Add 5 comprehension questions to help students focus on the main meaning.
- Create an alternate version of the activity where students will have to rephrase the content of the passage in their own words.

Small group discussions with guided questions

- Create 10 discussion questions related to topic X, where students should give complete answers.
- Add 3 different dialogue scenarios that students can represent.
- Create an activity where students should summarize their discussion in one paragraph.

Find the error in texts or dialogues

- Create a short text of 100 words with 10 mistakes that students need to correct.
- Add an activity where students have to explain why every mistake is wrong.
- Make a list of the most common mistakes students make in this unit and create a corresponding correction exercise.

Create your own exercise

- Give the students instructions on how to create their own exercise related to unit X.
- Make a list of 5 examples of exercises that students can create.
- Create a form template where students can record their practice.

Letter to a friend

- Write an example letter to a friend on topic X and leave blanks where students will fill in the appropriate words.
- Add an activity where students will respond to a classmate's letter.
- Make a list of 10 phrases that students can use in their letters.

Description of an image

- Choose a picture related to topic X and ask the students to describe it in 5-7 sentences.
- Add 3 helpful questions to guide the description.
- Create an activity where students will compare two images and find differences.

Create multiple-choice questions to practice history

- He created 10 multiple-choice questions on the topic [French Revolution]. He classified them into three levels of difficulty.
- He provided explanations as to why each answer is right or wrong.

Text completion test in literature

- Create a gap-filling text based on the work [Odyssey]. Focus on the use of vocabulary and style.
- Suggest suggestions that match the meaning of each gap and justify for which learning objectives they are appropriate.

Solving math problems step by step

- He compiled 5 math problems on the topic [analogy]. He presented the solution step by step.
- Evaluate the right and wrong answers."

Creating electronic word games for foreign languages

- Create 3 crossword-based exercises with words from the vocabulary [focus at school].
- He presented solutions to all the exercises."

Description of texts and production of comprehension questions

- Write 5 comprehension questions about the text [text title]. Categorize them into difficulty levels.
- Create example answers for each question.

Automated generation of questions for text analysis

- Production of analysis questions for the text 'Odyssey' chapter 5." He created five multiple-choice questions with the main theme of deciphering the characters of the protagonists."

Automatic creation of exercises for algebra

- Create an advanced level exam for linear equations."
- He proposed five function solving problems in intermediate-advanced mathematics."

History tests

- Production of five 'right or wrong' questions about the French Revolution."
- Create a 10-question exam about the Industrial Revolution."

Biology and chemistry

- Producing questions about human cells and their functions."
- He suggested exercises related to photosynthesis and the factors that influence it."

Logic assessment

- Create three logical puzzles for Tuesday High School."

Environmental education

- It raised questions about the effects of the greenhouse."
- Production of multiple-choice exercises for sustainable cities."

General reading comprehension test

- Create a reading comprehension test for fifth grade students with 10 questions.
- Write a 200-word text and make 5 open-ended questions.

Grammar exam

- Take a 15-question exam on irregular verbs in English.
- He created 10 sentences with grammar errors and asked the student to correct them.

Vocabulary test

- Create a vocabulary test with 10 words and synonym choices.
- Write 5 sentences where a word is missing and the student has to choose the correct one.

Spelling test

- Create 10 words for spelling and 5 sentences with errors to correct.
- Create a test where students have to fill in the correct spelling of words.

Proposal writing test

- Create an exam where students put the words in the correct order.
- Make 5 sentences in the active voice and ask them to be converted to passive.

Listening comprehension test

- Take an listening comprehension test based on a short story.
- Create multiple-choice questions for an audio clip.

Error correction exam

- Write down 10 sentences with grammatical errors and ask the student to correct them.
- Create a test where the student finds 5 errors in a text.

Short essay exam

- Give 3 essay topics and ask the student to choose one.
- Write down a topic and give the student instructions on how to write a 5-sentence paragraph.

Reading and pronunciation test

- Give a 50-word text and ask the student to read it aloud.
- Read a passage and ask the student to repeat it correctly.

True-false test

- He created 15 true-false questions about the past tense in English.
- Make 10 true-false sentences for the structure of a letter.

Matching exam

- Take a matching test with 10 words and their respective meanings.
- Create a matching activity with 5 questions for synonyms and antonyms.

Speaking task

- Give 3 topics and ask the student to talk for 1 minute.
- Create an oral test based on pictures that the student needs to describe.

Dialog-completing test

- Create a 10-sentence dialogue where one speaker's answers are missing.
- Build an exam where students fill in missing words in a dialogue.

Text Reorganization Exam

- Write a 100-word text and present it in jumbled sentences.

- Create a test where students place sentences in the correct order to create a story.



Activity 59. Individual work. Enhance, extend and adapt all of the above examples to your own needs.

Activities with tools that produce images from text

The use of an AI that produces images from text can bring significant changes to the educational context, introducing new levels of interactivity and adaptability to teaching processes. At the first level, a system based on this type of technology can enhance learning through the visualization of abstract concepts, providing students with the ability to relate theoretical information to concrete images, facilitating comprehension and memorization. The application of this technology is particularly useful in cognitive fields such as science, mathematics, history and geography, where understanding often depends on the visualization of data or historical facts.

In addition, students' creativity and participation are enhanced, as they are allowed to explore ideas and texts through the direct production of personalized graphics related to their interests and needs. At the same time, the tool can support students with learning difficulties or different preferred learning styles, offering personalized material that meets their specific challenges.

At the teacher level, this technology can simplify processes for the production of multimedia materials for teaching, as well as enhance the creation of authentic content, reducing dependence on third-party sources. In addition, the creation of visual material produced with this AI can support the integration of culturally diverse elements into the educational material, facilitating the development of multicultural understanding and the adaptation of material to global or local contexts.

In conclusion, the use of AI that produces images from text in education embodies a pillar of innovation that not only addresses existing challenges, but also shapes new ways in which educational approaches can be expanded, enriched and adapted to the needs of the modern learning environment.

Practical advice

The use of AI that produces images from descriptive text, such as DALL tools; E, MidJourney, and Stable Diffusion, requires strategy and careful formulation prompts to achieve optimal results. The image creation process is summarized in two main stages: (a) The appropriate description of the image elements and (b) the adaptation of virtual data with clear commands. The following paragraphs present practical tips for optimizing this experience, accompanied by examples of "good" prompts.

Photorealistic image

Example: "An astronaut is sitting in a café on the Moon, with Earth visible on the horizon, high-resolution photography, night shot."

Cartoon drawing

Example: "A baby dragon playing with an egg yolk in a magical forest, Studio Ghibli style, warm colors."

Historical reconstruction

Example: "The Agora of Athens in the 5th century BC, with philosophers discussing, realistic depiction with archaeological evidence".

Black and black illustration:

Example: "A dark knight in a castle ruin, silhouette with moon background, ink drawing with fine lines."

Focus on detail

The accuracy of the description is crucial. Use concise and clear keywords that will consistently guide AI. Describe features such as context, style, colors, theme expressions, and visual elements. Example: "A night scene in a forest, with a moon shining among the trees, realistic style, cool blues and green colors."

Define a visual style

Clarify the artistic style you desire. List specific styles, such as "realistic," "Chinese watercolor," "steampunk," or "futuristic." Examples: "A flying ship in black sky, steampunk style, detailed gears and mechanical parts,

bronze shades." "A lone bear in a majestic northern forest with a rainbow night, surreal, nostalgic style". "A rocket with bright blue flashes flies over an industrial planet with red mountains, inspired by cyberpunk aesthetic, digital painting, 4K."

Use examples of creators or art schools

You can request an image inspired by the work of specific artists or art schools. The connection with great artistic traditions enhances the accuracy of the result produced. Examples: "A painting of blooming sunflowers, inspired by Van Gogh's style, with dense brushstrokes and strong contrasting colors." "Abstract depiction of music as colored waves and geometric shapes, oil texture, painted by Kandinsky".

Specific focus and shooting angle

If you want the image to have a specific composition or perspective, specify the shooting angle or field range. Example: "Portrait of a lion in profile, close-up, with natural light penetrating the mane."

Add an emotional tone

Incorporate emotions or atmosphere through the formulation of prompts. This will give liveliness and unique style to the work. Example: "Sunset over a quiet lake, peaceful and nostalgic atmosphere, warm shades of orange and pink."

Modifiers

Words like "detailed," "hyper-realistic," "cinematic lighting," or "minimalistic" are useful to give further guidance to the camera. Examples: "Modern home interior, minimalist design, open spaces and natural light coming in through large windows." "An old woman with glasses, reading a book in a library with vintage style, cinematic lighting, focus on details."

Additional tips

- Replay: If the image isn't accurate, add more detail (e.g., "broken clock with gears floating in the gap, surrealism, digital art").
- Try negative commands: In tools like Stable Diffusion, you can specify what the image doesn't include (e.g., "no text, no blur").
- Leverage different platforms: Each tool (e.g. DALL-E, MidJourney) responds differently to prompts – experiment!

Things to avoid

- Overly general descriptions: Prompts like "a beautiful picture" or "a fantastic scene" may not work because they don't provide enough information.
- Avoidance of vague terms. Replace generic words (e.g. "beautiful") with descriptive phrases.
- Unrealistic descriptions of limited technologies: Have realistic expectations of the tool you use, as every AI has limits.

Below are training scenarios where the production of images from text can be utilized.

Visualization of historical events

Objectives

Enhance understanding of historical events and facilitate the assimilation of critical information through the use of visualization.

Description

As part of History courses, students will be able to describe historical events or periods in writing and use AI to create images that depict these events. For example, students can describe the Battle of Marathon by adding details, such as the layout of the troops, and observe the created images. This application facilitates both a better understanding of the period and the discussion of how the same event is interpreted through different texts or descriptions.

Tools

DALL-E, Stable Diffusion, MidJourney.

Design fictional cultures

Objectives

Apply knowledge of anthropology to the creation of imaginary societies. Analyze the effect of language on AI images.

Description

Students describe a culture with specific practices (e.g. ceremonies, technology) and create images of its objects or spaces. They discuss how word choice (e.g., "primitive" vs. "sophisticated") affects visual style.

Tools

MidJourney, Artbreeder, Google Earth.

Reconstruction of ancient artifacts

Objectives

To represent incomplete archaeological findings in a complete form. Appreciate the complexity of historical research.

Description

Based on photographs of fragments of pottery or statues, students describe what they think the original object looked like and create reconstructions with AI. They compare the results with academic representations.

Tools

DALL-E 3, Adobe Photoshop, 3D Builder.

Representation of mythological scenes

Objectives

To connect myths with a historical/cultural context. Analyze how AI manages symbolism.

Description

Based on ancient texts (e.g. Hesiod), students create images of gods or heroes. Discussion of cultural prejudices (e.g. why Athena is often depicted with European characteristics).

Tools

DALL-E, Google Arts & Culture, digital libraries.

Creating comics based on literary texts

Objectives

To encourage creativity and deeper understanding of literary texts through visualization.

Description

In Literature courses, students can undertake the conversion of descriptions from literary works to illustrated comics. Based on written descriptions of characters, locations or scenes, AI will produce images that students will then edit to create a coherent way of presenting the work. This approach encourages creativity while offering opportunities to study the author's style and the power of visual storytelling.

Tools

DALL-E, Canva, Procreate.

Create interactive grammar images

Objectives

Translate grammatical concepts (e.g. verbs, sentence) into visual visual tools. Improve understanding through audiovisual media.

Description

Students choose a grammatical principle (e.g. "passive voice") and create images that illustrate it with symbols or scenes. Then they create an interactive poster where each image is linked to explanations or exercises.

Tools

Canva, Genially, DALL-E.

Creation of cultural maps

Objectives

To understand cultural diversity and familiarize students with human geography.

Description

Students create written descriptions of cultures, such as traditional attire, rituals or landscapes, and use AI to create cultural maps. For example, they can describe a traditional village in Japan and observe the created image as a piece of the map linked to cultural information.

Tools

DALL-E, Google MyMaps, StoryMapJS.

Visual creation for poetry interpretation

Objectives

To enhance the emotional and creative understanding of poetry.

Description

Students are asked to interpret a poem describing it in written form and use AI to create corresponding images. These images can be presented in a group discussion, where students will compare their different interpretations. This scenario promotes creativity and analytical thinking about poetry.

Tools

MidJourney, Artbreeder, Canva.

Digital art inspired by poetry

Objectives

Interpret emotional tones of poems through images. Examine the relationship between metaphorical language and visual creativity.

Description

Students choose poems and create images based on lyrics (e.g. "cold night of broken dreams"). They compare how different AI tools interpret the same phrase and discuss the subjectivity of art.

Tools

DeepArt, NightCafe, Google Jamboard.

Consolidation of scientific terminology through visualization

Objectives

To facilitate the understanding and memorization of specialized terms and concepts in the natural sciences.

Description

In science lessons, students will enter descriptions of concepts, such as "the structure of the atom" or "the process of photosynthesis", into the AI platform. AI will create relevant images, helping students connect

concepts with visual representations. Teachers can also use this technique to test students' deep understanding, prompting them to create accurate and complete descriptions.

Tools

MidJourney, Clip Studio Paint, BioRender.

Visualization of abstract mathematical concepts

Objectives

To help students understand and clarify abstract mathematical concepts through graphical representation.

Description

In teaching mathematics, concepts such as "infinite space" or "quadratic function" can be described in writing and visualized visually. This approach is particularly useful for understanding concepts by students who respond more effectively to visual learning.

Tools

Stable Diffusion.

Visualization of scientific phenomena

Objectives

Transform abstract concepts (e.g. magnetic fields, DNA) into easily understandable images. Analyze the limits of AI in scientific imaging.

Description

Students write descriptions of phenomena (e.g. "the movement of electrons in a circuit") and create images. They then use scientific videos or diagrams to check whether the images correctly reflect the nature of the phenomenon. They perform presentations to explain any differences.

Tools

Stable Diffusion, Bing Image Creator, PhET Simulations.

Imaging of chemical reactions at the molecular level

Objectives

Understand the structure of molecules through visualizations. Identify inaccurate representations of AI.

Description

The students describe reactions (e.g. oxidation) and create images of molecules. Comparison with scientific diagrams and discussion of the limits of AI in imaging microscopic processes.

Tools

Chemix Lab, Stable Diffusion, MolView.

Visual clothing design for economics courses

Objectives

To understand the relationship between art and economy through product design.

Description

Students describe clothing models in detail (e.g. color, texture, design) and use AI to create visual examples. This can be combined with financial product design courses and marketing strategies, promoting cross-curricular learning.

Tools

Textileify, DALL-E.

Creating imaginary landscapes in writing workshops

Objectives

To enhance students' creativity in writing, especially in creating unreal worlds.

Description

In creative writing workshops, students describe landscapes from their own stories and then use AI to see the visual representation. This exercise helps give detail and depth to the descriptions they produce.

Tools

MidJourney, Artbreeder.

Learn a new language with visual support

Objectives

Enhance memorization of new words and phrases through visual learning.

Description

Students enter descriptions of objects or scenes in the language they are learning, and AI creates images based on them. Thus, learning words or expressions is combined with images, enhancing comprehension and memorization.

Tools

DALL-E, Quizlet.

Simulation of ideas for business plans

Objectives

To enhance the development and presentation of business ideas with visual accompaniment.

Description

In teaching entrepreneurship, students describe ideas for products or services and use AI to create visual representations of these ideas. This helps them present their ideas in a professional way.

Tools

DALL-E, Canva.

Creating illustrated fairy tales

Objectives

Combine narrative ability with visual creativity. Practice descriptive language for accurate results.

Description

Students write a short story and use AI to create images at any time. They comment on how their words affected the outcome (e.g., "Why does the dragon seem friendly?"). Eventually, they assemble the images into a digital book.

Tools

Canva, StoryJumper, NightCafe.

Designing sustainable cities

Objectives

Apply sustainability principles to urban planning. Analyze the relationship between descriptive language and visual results.

Description

The students describe a city with green energy and urban biodiversity, creating images with AI. They then use GIS tools to check the reality of the plans (e.g. climate inconsistencies).

Tools

Bing Image Creator, ArcGIS, Canva.

Create interactive biographical galleries

Objectives

To highlight the life and work of historical figures with visual material. Apply digital storytelling techniques.

Description

Students research the biography of a historical figure, write descriptions of important moments in his life and create pictures. The images are linked in an interactive dating with tools like ThingLink.

Tools

TimelineJS, ArtStation, Padlet.

Climate change visualization with simulated images

Objectives

Visualize the effects of climate change in different regions. Develop predictive thinking through visual scenarios.

Description

Students describe how a geographical area (e.g. beach, forest) could change in 50 years due to warming. They use AI to create before and after images, and discuss possible solutions to address the changes.

Tools

MidJourney, ClimateGAN, NASA Climate Time Machine.



Exercise 60. Individual work. Enhance, extend and adapt all of the above examples to your own needs.

Activities with tools that produce video from text

The use of AI that produces video from text in education raises significant potential for reshaping learning processes. First of all, this AI can enable multimedia educational material to be created, transforming static text into an audiovisual experience. This allows for enhanced figurative content and better integration of concepts by students, especially those with a visuospatial learning preference.

At the same time, this technology facilitates the specialization of material for personalized teaching, since it provides the ability to adapt the content to the needs, interests or level of understanding of students. Another crucial advantage is the ability to create materials in different languages or cultural contexts, which enhances inclusivity and intercultural education.

In addition, the use of AI that creates video from text reduces the time and effort required for teachers to produce multimedia material, allowing them to focus more on teaching and guidance. Finally, the potential of this technology can enhance the idea of lifelong learning through the flexibility it offers in presenting complex concepts in a simple and visually understandable way.

Practical tips for using text-to-video AI

Effectively using AI to create video from text requires accuracy, clarity and strategy when writing prompts. As AI tools evolve, the ability to guide with detail and creativity will be a key element of success for every user. Experiment and remember that the quality of the result largely depends on the quality of the description you provide.

The following paragraphs present practical tips for optimizing this experience, accompanied by examples of "good" prompts.

Define a clear purpose

Specify the purpose of the video before writing the call-to-action. Want to create an ad, video tutorial, or art production? Each category requires a different style and level of detail.

Use a detailed description

Include specific details about the content, aesthetics, style, and atmosphere of the video. List colors, backgrounds, characters, camera style, and time points if appropriate.

Simplicity with precision

Avoid overly general descriptions or complicated prompts that can confuse AI. Use clear and coherent language.

Frame

Give specific details about the target audience or the feeling you want the video to convey. The more information you provide, the more accurate the result will be.

Experimentation and optimization

Try various versions of prompts, analyze the results and modify the text until you reach the desired result.

Additional tips

- **Test and improve.** Start with short videos (1-2 minutes) to check if the tool meets your preferences. If the result is chaotic, try to divide the text into smaller, focused parts before resending it.
- **Accessibility.** For students with hearing difficulties or non-native speakers, add to the prompt: "Include closed captions and images that repeat the main ideas of the text without relying only on voice."
- **Utilization of existing materials.** If you want to convert an existing lesson, use the text as a basis, but add instructions for visualization: "Turn this paragraph about the water cycle into a video with tags showing evaporation, condensation, rain."

Examples of good and bad prompts

Good prompt: "Create a sci-fi style video: Scene on an exoplanet with two sunsets. The sky is orange and blue, with thick clouds moving fast. An astronaut in a futuristic suit walks slowly, while large alien plants sway in the wind. Soft piano melody sounds in the background. The camera starts with a wide shot and gradually zooms in on the astronaut." This prompt provides a clear description of the setting, mood, atmosphere and camera movements, giving AI all the information necessary to produce a rich video.

Bad prompt. "Make a nice video on a planet." The prompt is too general and vague. It does not offer any useful information on how to design the video, what style to follow, or what elements to include.

Good prompt. "He made a short animation video for children: A vibrant forest with green trees and colorful flowers. A smiling fox jumps around a stream, while small birds chirp from the branches. The music is cheerful and playful. Focus on the fox's movement with close-ups of his face." This description is specific and oriented towards creating a friendly and enjoyable video for children.

Bad prompt. "Make a video of animals in the forest." The prompt is so generic that AI cannot produce a planned and meaningful result.

Here are training scenarios where video production from text can be utilized.

Interactive educational videos for teaching history

Objectives

Enhance understanding of historical events through text visualization.

Description

As part of history teaching, AI can turn descriptions of historical events into short animated videos. Students have the opportunity to "travel" virtually to different historical periods, watching the details mentioned in the teaching material. For example, a description of the Battle of Marathon can be rendered visually, with dramatized snapshots that bring the events to life. This tool offers a substantial boost in understanding and attracting interest.

Tools

Runway ML, Pictory, Synthesia.

Construction of STEM educational videos

Objectives

Deepening understanding of complex scientific concepts through a multisensory approach.

Description

The AI tool creates videos that illustrate scientific concepts, such as the process of breaking up an atom or the evolution of the universe. The videos are tailored to the needs of each lesson and student, incorporating visual descriptions, graphs, and representations that help with overall understanding. For students with difficulties understanding difficult concepts, this technique can transform teaching, making it accessible.

Tools

Animoto, Deepbrain AI, Kaiber AI.

Creation of digital fairy tales for primary education

Objectives

Development of imagination, creativity and interest in language.

Description

Students write short stories, which AI later turns into animated videos. This activity promotes creative writing and offers an interactive experience where each student sees the "world" they created come to life on the

screen. At the same time, teachers can use the material to teach language structures, vocabulary, and narrative techniques.

Tools

Toonly, StoryAI, Plotagon.

Virtual tours of geographical landscapes

Objectives

Understanding of geographical data and natural phenomena using audiovisual teaching.

Description

Teachers can create videos presenting different geographical landscapes and phenomena, based on texts or textbook descriptions. For example, the description of volcanoes can be enriched with visual demonstrations of eruptions, movements of lithospheric plates, and images of real landscapes. This enhances audiovisual memory and is considered effective for knowledge acquisition.

Tools

Lumen5, D-ID, Filmora.

Interactive teaching of literature through visualization of human characters

Objectives

Support the understanding and analysis of literary texts through visual enhancement of characters.

Description

AI can convert descriptions of characters and scenes from literary texts into videos. For example, in the analysis of Kazantzakis' "Rebel", students could watch a dramatization of the scenes they study. Through visualization, understanding of literary storytelling is facilitated and students' engagement with the lesson is increased.

Tools

Deepmotion, Narrato, Visme.

Visualization of experiments in chemistry

Objectives

Safe visualization of chemical reactions and phenomena.

Description

Instead of actually conducting experiments, teachers could use AI to create videos that show predictable outcomes of chemical reactions while explaining the process. This tool is particularly useful in environments where access to laboratories is limited or when there is a fear of danger due to complex substances.

Tools

Blender AI, Fliki, Descript.

Teaching human rights through simulations

Objectives

Cultivate empathy and sensitivity for social issues.

Description

The tool can create dynamic videos describing human rights violations or revolutionary moments in history for justice. This method helps students understand deeper critical social issues while providing motivation for discussion and reflection in the classroom.

Tools

Pictory AI, Vyond, Synthesia.

Preparation for practical skills (e.g. first aid)

Objectives

Provide practical guidance through audiovisual material for everyday skills.

Description

Students can watch AI-generated videos for practical instructions, e.g. how to perform CPR (cardiopulmonary resuscitation). The videos contain interactive representations and explanations that make these activities easier to understand.

Tools

Movio, Vyond, Canva Video.

Visual creation of stories for teaching literature

Objectives

Enhance understanding and deepening in literary texts. Cultivation of creative thinking and visual storytelling. Promoting students' active participation in the learning process

Description

The script focuses on the creation of short videos that visualize literary texts or excerpts. Students read and analyze a text or poem and then transform it into a script for a short video. Utilizing Artificial Intelligence software to convert text to video (text-to-video), they design and produce a visual version of the work, incorporating words, images, animations and sounds that reflect the theme and aesthetics of the text. This activity allows students to examine more deeply the themes, characters and literary devices of reading, while enhancing their creative thinking. At the end of the process, students present the produced videos to their classmates creating a collective and participatory exhibition.

Tools

Synthesia, Pictory, Runway ML, Canva Video Maker.

Create informative videos on environmental issues

Objectives

Informing students about important environmental problems. Practicing scientific information search skills. Development of skills in digital communication

Description

Students choose an environmental issue (such as climate change, deforestation or ocean pollution) and gather relevant information from scientific articles, news and authoritative online sources. Using artificial intelligence tools that turn text into video, they create informative material in the form of a short video, which includes texts, images, and multimedia. This activity helps students cultivate environmental awareness, while at the same time familiarizing them with how to present scientific data to the public. The videos are presented either at a school event or published on educational platforms, promoting the extroversion of the school.

Tools

Lumen5, Descript, Visme, OpenShot (for additional editing).

Historical chronographs through visualization

Objectives

Enhance understanding of historical events. Connecting History with everyday life through multimedia. Practicing critical thinking and analysis of events

Description

As part of history courses, students are asked to choose an important event from world or national history. Then, and after studying the topic, they create written descriptions or chronicles that include the historical context, highlights and consequences of the event. Using AI tools, they turn these descriptions into videos, where they use period images, digital representations and audio clips (such as speeches or music). This activity allows students to see History as a living, dynamic process, while strengthening the connection between the past and the present.

Tools

HistoryShots, Animoto, Movio, Final Cut Pro (for editing).

Career guidance promotional videos

Objectives

Informing students about career choices. Promoting the right decision for educational pathways. Familiarity with skills in presenting personal goals

Description

Students are asked to create a short "promotional" video that presents a professional field that they find interesting or likely to follow. Initially, they investigate the characteristics of the profession, the required qualifications and the prospects for development. They then leverage AI tools to create professional videos that include a combination of text, images, video, statistics, and audio. This project gives students the opportunity to discover their potential while developing communication and digital skills. The videos produced can be used as part of the course for discussion and exchange of views.

Tools

Animaker, Biteable, Renderforest, Powtoon.

Interactive art history

Objectives

To familiarize students with cinematic representations of artistic eras, to enhance visual memory and critical thinking.

Description

Students enter text with characteristics of an art (e.g. Renaissance). AI creates videos that combine artwork, animated analysis techniques, and voice narration. The video is used to discuss the influence of the season.

Tools

Pictory, Canva for editing, course management platform (Moodle).

Personalized grammar lessons

Objectives

To help students with dyslexia understand grammatical rules through multisensory learning.

Description

The education system converts grammar rules (e.g. verbs) into animated videos showing their use in sentences, accompanied by subtitling and repeated captions.

Tools

Synthesia, Google Docs for text, Kapwing for subtitles.

Virtual chemistry lab

Objectives

Demonstrate dangerous or expensive experiments safely, develop hypothetical reasoning.

Description

The teacher enters an experiment description (e.g. $\text{Na} + \text{H}_2\text{O}$ reaction). AI creates realistic videos with virtual lab instruments, graphic representations of molecules and safety warnings.

Tools

Runway ML, Labster (consolidation), PowerPoint for supplementary material.

Multilingual literary narratives

Objectives

To support students with different native languages in understanding classical texts.

Description

The text of the "Odyssey" is transformed into a series of videos with language transitions (Greek/English), symbolic images for scenes and subtitle selection. Students follow and compare language versions.

Tools

DeepL for translation, InVideo, YouTube Studio.

Mathematics through fairy tales

Objectives

To teach geometric concepts to primary school children with a narrative element.

Description

Creation of a video-fairy tale where shapes (circle, triangle) are characters that solve problems. It includes interactive video pause questions for calculations.

Tools

Animaker, Blender for 3D graphics, Quizlet for exercises.

Simulation of historical speeches

Objectives

To develop rhetorical skills and historical awareness.

Description

Students write a speech that Pericles would give. AI creates videos with a digital avatar that speaks against a background of Ancient Athens, complemented by texts and maps.

Tools

D-ID for avatars, Audacity for audio, Genially for maps.

Diachronic analysis of philosophical ideas

Objectives

To relate abstract philosophical concepts with contemporary paradigms.

Description

Video showing how Plato's cave allegory could be illustrated with technological metaphors (e.g. virtual reality). It comes with an idea comparison quiz.

Tools

Pictory, Kahoot, Adobe Spark for graphics.

Practicing clinical skills of doctors

Objectives

To simulate disease conditions for medical students.

Description

Transform clinical scenarios (e.g., diabetes diagnosis) into videos with AI actors showing symptoms. The students analyze the video and suggest treatments.

Tools

Synthesia, ChatGPT for screenwriting, MedEdPortal.

Visually explained poetry

Objectives

To enhance literary interpretation through audiovisual penetration.

Description

The poem "Free Besieged" is transformed into a video with symbolic images (e.g. broken walls), synchronized with the flow of the text and voice reading with pitch fluctuations.

Tools

Descript for audio, NightCafe for AI graphics, Edpuzzle for questions.

Professional preparation training

Objectives

To prepare students for job interviews with practical examples.

Description

Videos with different interview scenarios (positive/negative examples) where AI avatars impersonate employers. Includes on-screen text tips.

Tools

HeyGen, LinkedIn Learning, Zoom for simulations.

Ecological awareness

Objectives

To show the impacts of climate change with dynamic visualizations.

Description

Conversion of sea rise data into videos with dynamically changing maps, before-after iceberg footage and forecasts for 2100.

Tools

Flourish for graphics, OpenAI Sora for video, ArcGIS for maps.

Music education

Objectives

To teach musical scales and harmonies through sensory interaction.

Description

Video where the notes appear as colored balls reacting to their height and duration, accompanied by piano sound and explanations for space transport.

Tools

AIWA for music, Blender, Flat.io for sheet music.

Psychological support for anxiety

Objectives

Provide stress management strategies with audio-visual exercises.

Description

Video guide with guided imagery (e.g. forest walk) automatically generated from text of therapeutic exercises, with adjusted music and natural images.

Tools

MidJourney for images, Headspace for recordings, Calm.



Exercise 61. Individual work. Enhance, extend and adapt all of the above examples to your own needs.

Activities with tools that produce music from text

The use of AI that can produce music from text offers a powerful framework for education, enhancing learning through cross-curricular methods and increasing the attractiveness of teaching. At a first level, such a tool can be used to promote creativity and interconnect different learning fields, such as language and music, offering students the opportunity to experience the interaction between textual expression and sound production.

In addition, it can support personalized learning through the provision of tools tailored to students' needs and preferences. For example, students can create music that expresses their understanding of a text, allowing teachers to assess their content and interpretation skills. This process can also enhance critical thinking, as students should consider how text translates into sound features such as rhythm, pitch and melody.

The tool can also promote emotional intelligence by allowing students to explore emotions through music and text. In addition, it supports teaching through multisensory approaches, which enhance memory and concentration. Finally, integrating such technologies into education enhances technology literacy and prepares students for a future where AI skills are essential.

Practical advice

Effective use of this technology requires a well-structured approach to writing prompts. Below are practical tips, along with examples of good and bad prompts.

Basic rules

- Specify explicit parameters
- Description of sentiment or atmosphere
- Reference to specific musical genres or artists
- Set structure and duration
- Use of technical terminologies
- Adapting to the public
- Avoidance of excessive complexity
- Set a clear tone and direction: Clarify the kind of music or emotion you want to create. This gives AI clear instructions to guide production.
- Use specific descriptions: Focus on details such as instruments, rhythms, and dynamics so that the result is more tailored to your needs.
- Provide cultural and time frame: If you want music inspired by specific traditions or eras, please specify this.
- Experiment with different prompts: Each AI responds differently to instructions. Try different phrases and approaches to find the best one.
- Try and repeat. Start with short snippets (15-30 seconds) to test AI accuracy. If the result doesn't match, try adding more restrictions (ex: "Reduce wind use" or "Add bolder drums to chorus").
- Accessibility. For educational purposes, request music with subtle rhythms and minimal volume fluctuation so it doesn't distract from the main content.

Examples of good prompts

- Create a relaxing piece with the piano as the main instrument, which brings to mind the serenity of a sunset by the sea.
- He composed an energetic composition of electronic music inspired by the 1980s, with synthwave-like rhythms.
- He produced a dramatic orchestral music, full of intensity, with intense use of strings and drums, suitable for an epic battle scene.
- He created a jazz piece full of improvisations, with saxophone as the leading instrument and swing rhythm.
- He created a relaxed jazz melody in decibelo, with piano and double bass, 80 BPM rhythm and verse-chorus-verse structure.

- He composed an electronic track with an etheric atmosphere, emotional synthesizers and light drums for product wellness advertising.
- He composed a 90-second musical theme for puzzle play: cheerful, with 8-bit keys, a 120 BPM rhythm and a repeating pattern without vocals.
- Create ambient sounds for meditation: low-frequency notes, rainfall in the background and intermittent bell sounds, without sudden changes.
- Create music for children's play: lively melody with woodwinds, chimes and a repetitive chorus for easier memorization.
- He composed a simple acoustic track with guitar and vocals, without drums, for a podcast background.
- Production of music reminiscent of the early period of Pink Floyd, with experimental guitar sounds and psychedelic transitional phrases.
- He created a 2-minute orchestral theme for a movie trailer, scaling from piano to full orchestra and dramatic climax in the final half minute.
- He composed a ballad on a C major scale, with flute as the main member, slow violin tremor in the background and modern rhythmic layer.

Examples of bad prompts

- Make a song that's nice.
- Create music with piano and/or other instruments.
- Something that looks like music but happier.
- Make jazz music.
- Create happy electronic music.
- He composed music for a party, but not very loud.
- He created a lyrical ballad.
- Make music for kids.
- Create a song with all the instruments.
- Make a romantic song.
- Create music that sounds like a hit.
- Make music like a famous band.
- Make music for trailers.

Analysis of the effectiveness of the examples

Good prompts are characterized by clarity, description and direction, which allows AI to work with specific parameters. For example, the prompt that refers to "serenity of a sunset" not only determines the style but also creates an image that can be translated into musical elements. On the contrary, bad prompts are generic and vague, making it difficult for AI to produce satisfactory results.

Here are training scenarios where video production from text can be utilized.

Creating musical written expression

Objectives

To enhance students' creative expression through the musical composition resulting from their texts. Understand the connection between language and music.

Description

Students are asked to write a short text that expresses feelings or tells a story. The text is then entered into an AI platform that converts the text into music. The music produced can be discussed in class about how it expresses the mood of the text, emphasizing the connection between words and sounds.

Tools

OpenAI MuseNet, Amper Music, Aiva.

Musical interpretation of poems

Objectives

To familiarize students with the interpretation of poetry through musical form. To develop critical thinking and artistic expression skills.

Description

Students are asked to choose a poem. The poem is entered into the AI application, which turns the text into a musical work. The students analyze how music conveys the aesthetic and emotional charge of the poem. They then discuss whether the musical interpretation is consistent with their own understanding.

Tools

Google Magenta, OpenAI MuseNet

Music profile of literary heroes

Objectives

To understand the characters of literary works in depth. To create connections between literature and music.

Description

When studying a literary work, students create a musical composition based on a character's descriptions and emotions, using AI to create music from text. Then, each student presents the "musical identity" of the hero in class, accompanied by an analysis of the elements chosen.

Tools

Aiva, Soundraw.

Explore cultural music heritage

Objectives

To enhance knowledge about the cultural values and musical traditions of different regions of the world. To strengthen critical thinking about multiculturalism.

Description

Students write a short description of a cultural event or tradition and enter their text into AI to produce corresponding music. They then compare the creation with traditional sounds of the area they described and discuss the accuracy and artistic value of the music.

Tools

Jukedeck, Amper Music.

Intercultural music recognition

Objectives

To integrate traditional musical elements from different cultures into learning.

Description

Students enter descriptions of instruments or rhythms (e.g. "Create a piece with djembe and kora, West African rhythm"). AI produces music that is comparable to original recordings.

Tools

Ecrett Music, Spotify for research, Ethnodoxology databases.

Improvised musical stories

Objectives

To develop students' narrative skills through musical expression. Understand the combination of sound and speech in narration.

Description

Students create a fictional scenario or story and enter it into the AI platform for composing music. The music produced is then presented to the classroom and serves as an audio depiction of the story. In the discussion, the possibilities of musical storytelling are explored.

Tools

Aiva, Soundful.

Turning emotions into music

Objectives

To enhance emotional intelligence and understanding of emotions through music creation. To examine music as a means of communicating emotions.

Description

Students write a short text that expresses a specific emotion, such as joy, sadness, or fear. Text is converted into music via AI. In the discussion, we examine how music conveys emotion and what elements contribute to its emotional dynamics.

Tools

OpenAI MuseNet, Amper Music.

Emotional music analysis

Objectives

To identify how music affects emotions.

Description

Create identical melodies with different parameters (e.g. "Produce the same melody on a major and minor scale"). Discussion on public reaction.

Tools

Melobytes, MIDI.js, Google Forms for polls.

Music composition for scenes of ancient drama

Objectives

To connect ancient dramatic art with contemporary musical creation. To understand the importance of music in theatrical performances.

Description

The students choose a scene from ancient drama, such as Sophocles or Euripides, and write a descriptive narrative. AI turns description into music. The composition is used in a representation of the scene. Students examine how music supports the theatrical experience.

Tools

Soundraw, Aiva.

Music news commentary

Objectives

To strengthen critical reflection on social phenomena. Examine the influence of music on various media.

Description

Students write texts commenting on a news story or social phenomenon. They then import the text into an AI platform to create music from texts. The students examine how the music emphasizes the message of the text and whether it is compatible with its tone and severity.

Tools

Musico, OpenAI MuseNet.

Musical portraits of celebrities

Objectives

To combine historical knowledge with musical creation. To explore the educational implications of different forms of expression.

Description

Students write a descriptive text about a historical or contemporary personality that inspires them. The text is transformed into a musical composition through AI. The resulting musical presentation is analyzed as to whether and how it captures the character and influence of personality.

Tools

Aiva, Google Magenta.

Creating soundtracks for video games

Objectives

To connect Artificial Intelligence technology with the gaming industry. To enhance creative thinking for multimedia design.

Description

Students develop an idea for a video game and describe its plot. These descriptions are inserted into AI platforms to create music. The final production can be evaluated for how it supports the theme and atmosphere of the video game.

Tools

Soundraw, Aiva, Jukedeck.

Dramatic musical narration of a scientific exhibition

Objectives

To improve the presentation of scientific data through artistic means. To enrich the educational experience of students.

Description

Students write summaries of scientific or environmental topics that interest them. Using AI tools, these texts are transformed into music that could accompany corresponding scientific presentations. Students evaluate the emotional dynamics of music in relation to its scientific content.

Tools

Soundful, Amper Music.

Composing orchestral music based on mythological stories

Objectives

To cultivate imagination and creativity through the renegotiation of mythological themes.

Description

Students choose a mythological story and write a concise narrative. They then use AI to create a piece of music that could dress up the story. After performing the music, students examine whether and how the music brings out the heroic or tragic element.

Tools

Aiva, OpenAI MuseNet.

Introduction to music theory

Objectives

To understand basic principles of melody, rhythm and harmony through automated creation.

Description

Students experiment with prompts such as "Create a simple melody on a C major scale with a 4/4 rhythm". AI produces music clips, which are analyzed to explain concepts such as pitch, intervals and color progression.

Tools

AIVA, MuseNet, Flat.io for sheet music.

Create background for theatrical performances

Objectives

Develop skills in combining music and storytelling.

Description

Students write scripts for short performances and use AI to produce music variations that match the mood of each scene (e.g., "Composed mystery music with percussion and low violin notes").

Tools

Soundraw, GarageBand, Audacity.

Music history

Objectives

To correlate historical musical periods with modern production techniques.

Description

Create playlists of music that simulates specific eras (e.g. "Production of a baroque piece with harpsichord and violin, 60 BPM"). Discuss the difference between authentic and AI-created compositions.

Tools

Amper Music, Google Arts & Culture, MIDI keyboards.

Music product advertising

Objectives

Develop marketing skills through audience targeting.

Description

Students select products and create music commercials based on the target group (e.g. "Composed jingle for energetic youth attire with electronic beats").

Tools

Jukedeeck, Canva for visuals, Anchor.fm.

Rhythmic gymnastics with personalized music

Objectives

Combine physical activity with rhythmic perception.

Description

AI creates music based on training intensity (e.g., "Producing 140 BPM music with intense drums for HIIT"). The students adapt their movements to the rhythm.

Tools

Almusic, Fitbit, YouTube for dance tutorials.

Narration with live background music

Objectives

Improve their narrative ability with emotional effects.

Description

When telling stories, students use real-time prompts (e.g. "Add dramatic percussion when the hero is in danger") to create atmosphere.

Tools

Boomy, Voicemod, Zoom for live performances.

Music therapy for special needs

Objectives

Support students with autism disorders or anxiety through personalized music.

Description

Creation of sound environments based on each student's energy patterns (e.g. "Composed ambient sounds with natural noise and low cello notes").

Tools

Endel, Brain.fm, Noise-canceling headphones.

Language teaching through primary school music

Objectives

Enhance pronunciation and vocabulary with melodic repetitions.

Description

Convert vocabulary to songs (e.g. "Create a song in French about colors with an easy chorus"). The students sing and record their performances.

Tools

Splash Pro, Lyrics Training, LanguagePod101.

Recomposition of classical works

Objectives

Explore alternative interpretations of well-known compositions.

Description

Students change parameters in projects (e.g. "Play Theodorakis' Avenue of Tears with electronic instruments") and compare them with the originals.

Tools

OpenAI Jukebox, IMSLP for sheet music, Audacity.

Create sound effects for videos

Objectives

Learn the importance of sound in audiovisual storytelling.

Description

Combining AI-created music with handcrafted sound effects (e.g., "Add mysterious music and steps in corridors for horror videos").

Tools

Artlist, Epidemic Sound, Adobe Premiere.

Music and natural science

Objectives

Understand the effect of physics (e.g. frequency, amplitude) on musical perception.

Description

Experiments where students change parameters (e.g. "Create the same note at 440 Hz and 880 Hz") and observe the differences.

Tools

Online Tone Generator, Sonic Pi, Oscilloscope software.

Social action through collective synthesis

Objectives

Use music as a means of social communication.

Description

Students collaboratively create a song about a social issue (e.g. "Compose a hip-hop track with anti-bullying messages"). AI combines their ideas into one final piece.

Tools

BandLab, Soundtrap, Padlet for collaboration.



Activity 62. Individual work. Enhance, extend and adapt all of the above examples to your own needs.

Activities with Deepfake tools

Deepfakes can be used creatively in education, offering interactive and innovative activities to enhance critical thinking and learning. Here are ideas of AI and deepfakes activities.

Deepfakes Analysis and Identification (critical thinking and digital literacy)

Target

Students learn to recognize fake videos and images.

Procedure

Presenting authentic and deepfake videos and comparing differences. Talk about signs such as eye discontinuities, strange expressions and facial deformities. Use of deepfake detection tools (e.g. Deepware Scanner).

Tools

- [Deepware Scanner](#) – Checks if a video is deepfake.
- [Sensity AI](#) – Analyzes deepfakes with AI.

Create "living story" with deepfake videos

Target

Students bring historical figures "to life".

Procedure

They choose a historical figure (e.g. Einstein, Socrates). They use AI tools to create a small speech from the character. They present the deepfake video and discuss its accuracy.

Tools

- [D-ID](#) – Converts images into talking avatars.
- [MyHeritage Deep Nostalgia](#) – Gives "life" to old photos.

Create video tutorials with deepfake teachers

Target

Using Deepfake AI to create interactive video tutorials.

Procedure

The professor creates an avatar of himself with AI. The avatar can present lessons, answer questions, or explain difficult concepts. Students attend the AI-generated course and evaluate the quality of information.

Tools

- [Synthesia](#) – Create deepfake video tutorials.
- [HeyGen](#) – Creates text-to-speech avatars.

Fake news and deepfake media scenarios

Target

Students understand the danger of misinformation through deepfake.

Procedure

Creating a fake video with "news" based on deepfake. Analysis of how the media can manipulate information. Discussion on the importance of fact-checking and fake news detection tools.

Tools

- [Fake Video News Detector](#) – Recognizes fake videos.
- [Deeptrace](#) – Detection of deepfake fake news.

Conclusion

Deepfake AI tools can be useful learning tools, but they must be used responsibly. Educating students to recognize deepfakes and understand their impact is essential in today's digital age.



Activity 63. Individual work. Enhance, extend and adapt all of the above examples to your own needs.