ERASMUS+ ARTIE
ARTIFICIAL INTELLIGENCE IN EDUCATION

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ARTIE: Artificial Intelligence in Education - challenges and opportunities of the new era:
development of a new curriculum, guide for educators and online course for students
Project co-funded by European Union under Erasmus+ Programme, 2020-1-HR01-KA201-077800

TITLE: What is artificial intelligence?

LEARNING SCENARIO		
School:	*Duration (minutes):*	90
Teacher:	*Students age:*	10+

Essential Idea:	Artificial intelligence leverages computers and machines to mimic the problem-solving and decision-making capabilities of the human mind.

Topics:

- artificial intelligence (AI), history of artificial intelligence

Aims:

- get to know and understand the concept of artificial intelligence
- recognize examples of AI use in everyday life

Outcomes:

- development of the skills of logical thinking, intuition, imagination and inference
- development of social competencies, including team and project work skills
- development of elements of students' cooperation, exchange of ideas and experiences with the use of technology

Work forms:

- individual work, work in pairs, group work

Methods:

- presentation, talk/discussion, graphic work, interactive exercise

ARTICULATION
The course of action (duration, minutes)
INTRODUCTION
The purpose of this course/ lesson is to make students aware of the changing ways of living under the influence of the newest technology.

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The teacher announces the topic and starts the discussion:
- Can a computer or other smart devices think or solve problems?
- What is artificial intelligence?
- Do we use AI? How? Where?

Announcement of the goal of the lesson:
Today we will learn what AI is and how we use an AI in everyday life.

MAIN PART

The teacher encourages students to be actively involved in the teaching process.

Topics for discussion:
What is AI? Which is the definition of AI?
Since when does AI exist?
Can devices be smart/intelligent?
Can devices replace humans?
What is an ideal intelligent machine?
Advantages and disadvantages of AI

Artificial intelligence (AI)

Artificial intelligence (AI) is the ability of a computer program or a machine to think and learn. It is also a field of study that tries to make computers "smart". John McCarthy came up with the name "artificial intelligence" in 1955.

In general use, the term "artificial intelligence" denotes a machine that mimics human cognition. At least some of the things we associate with other minds, such as learning and problem solving can be done by computers, though not in the same way as we do.

An ideal (perfect) intelligent machine is a flexible agent which perceives its environment and takes actions to maximize its chance of success at some goal. As machines become increasingly capable, mental facilities once thought to require intelligence are removed from the definition. For example, optical character recognition is no longer perceived as an exemplar of "artificial intelligence": it is just a routine technology.

At present we use the term AI for successfully understanding human speech, competing at a high level in strategic game systems (such as chess), self-driving cars, and interpreting complex data. Some people also consider AI a danger to humanity if it progresses unabatedly.

An extreme goal of AI research is to create computer programs that can learn, solve problems, and think logically. In practice; however, most applications have picked on problems that computers can do well. Searching databases and doing calculations are things computers do better than people. On the other hand, "perceiving its environment" in any real sense is way beyond present-day computing.

AI involves many different fields like computer science, mathematics, linguistics, psychology, neuroscience, and philosophy. Eventually, researchers hope to create a "general artificial intelligence" that can solve many problems instead of focusing on just one. Researchers are also trying to create creative and emotional AI which can theoretically empathize or create art. Many approaches and tools have been tried.

History of AI

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The idea of a 'machine that thinks' dates back to ancient Greece. But since the advent of electronic computing (and relative to some of the topics discussed in this article) important events and milestones in the evolution of artificial intelligence include the following:

1950: Alan Turing publishes Computing Machinery and Intelligence. In the paper, Turing—famous for breaking the Nazi's ENIGMA code during WWII—proposes to answer the question 'can machines think?' and introduces the Turing Test to determine if a computer can demonstrate the same intelligence (or the results of the same intelligence) as a human. The value of the Turing test has been debated ever since.

1956: John McCarthy coined the term 'artificial intelligence' at the first-ever AI conference at Dartmouth College. (McCarthy would go on to invent the Lisp language.) Later that year, Allen Newell, J.C. Shaw, and Herbert Simon created the Logic Theorist, the first-ever running AI software program.

1967: Frank Rosenblatt builds the Mark 1 Perceptron, the first computer-based on a neural network that 'learned' through trial and error. Just a year later, Marvin Minsky and Seymour Papert published a book titled Perceptrons, which became both the landmark work on neural networks and, at least for a while, an argument against future neural network research projects.

The 1980s: Neural networks which use a backpropagation algorithm to train itself become widely used in AI applications.

1997: IBM's Deep Blue beats the world chess champion, Garry Kasparov, in a chess match (and rematch).

2011: IBM Watson beats champions Ken Jennings and Brad Rutter at Jeopardy!

2015: Baidu's Minwa supercomputer uses a special kind of deep neural network called a convolutional neural network to identify and categorize images with a higher rate of accuracy than the average human.

2016: DeepMind's AlphaGo program, powered by a deep neural network, beats Lee Sedol, the world champion Go player, in a five-game match. The victory is significant given the huge number of possible moves as the game progresses (over 14.5 trillion after just four moves!). Later, Google purchases DeepMind for a reported $400 million.

Graphic works:

- Students jointly recognize and highlight the advantages and disadvantages of AI. The teacher creates a classroom online poster in which students enroll and present the advantages and disadvantages of using AI. (Padlet, Lino.it etc.)
  The teacher saves all student work in the classroom portfolio.

- Students draw their own drawings to show the development of AI. Students can use a drawing to show their prediction of how AI will develop and be used in the future. Students can draw on paper or on a computer (Paint 3D, https://kidmons.com/game/paint-online/, https://www.tate.org.uk/kids/games-quizzes/tate-paint or others) as instructed by the teacher. They present their works to the teacher and students in the class.
  The teacher saves all student work in the classroom portfolio.

- Students imagine and create their own example of AI that helps them in performing daily activities (in performing tasks at school, at home, for hobbies or in their free time).
  What are the characteristics of their fictional product/service?
  How does it make tasks easier?

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Why is it special and how will it win over future users?
Students draw their product/service and present its characteristics in the form of a mental map.
Students can draw on paper or a computer (Paint 3D, https://kidmons.com/game/paint-online/,
https://www.tate.org.uk/kids/games-quizzes/tate-paint or others) as instructed by the teacher.
They present their works to teachers and students in the class.
The teacher saves all student work in the classroom portfolio.

- Organize a class competition:
  https://studio.code.org/s/oceans/lessons/1/levels/1
  https://petalica-paint.pixiv.dev/index_en.html

CONCLUSION

AI is computer systems on the basis of rationality and thinking vs. acting:
        Human approach:
                Systems that think like humans
                Systems that act like humans
        Ideal approach:
                Systems that think rationally
                Systems that act rationally

Methods		*Work forms*
presentation	interview	individual work
talk/discussion	demonstration	work in pairs
work on the text	role playing	group work
graphic work		frontal work
interactive exercise /simulation on the computer		

Material

- https://studio.code.org/s/oceans/lessons/1/levels/1
- https://petalica-paint.pixiv.dev/index_en.html

Literature

- https://www.forbes.com/sites/bernardmarr/2019/12/16/the-10-best-examples-of-how-ai-is-already-used-in-our-everyday-life/?sh=213f08da1171
- https://www.ibm.com/cloud/learn/what-is-artificial-intelligence
- https://kids.kiddle.co/

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PERSONAL OBSERVATIONS, COMMENTS AND NOTES