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Project Acronym: PAFSE

Project title: Partnerships for Science Education

EDUCATIONAL SCENARIO
ARTIFICIAL INTELLIGENCE AND PUBLIC
HEALTH
(ENGLISH VERSION)



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Context

The pandemic brought severe social and economic impacts and healthcare systems were disrupted by the need to diagnose, trace patients in isolation at home, assure in-home and inpatient care, according to the severity of the cases. At the moment, more than 6 million deaths have been attributed to COVID-19 around the globe. Creating awareness of the symptoms and actions to be taken in their presence is very important, not only to increase personal protection but also to help contain the spread of communicable diseases in the community. This can be supported by artificial intelligence (AI) systems, which have been successfully employed for healthcare purposes during the pandemic and many positive outcomes have been documented (e.g., improved COVID-19 screening, diagnostics, follow-up, timely response, most reliable response, efficient outcomes, etc.). In this context, it is important to explore ideas and develop students thinking computing around the use of AI systems, and produce creative digital artifacts, using digital strategies and tools to support students' creativity in educational environments: know and explore the concept of AI, the steps for creating and developing an AI system, and promote understanding and classroom debate around its use as an emerging technology.

Scientific content and its relevance to public health education

Students should adopt a critical, thoughtful, and responsible attitude in the use of digital technologies, environments, and services. In fact, the goal of creating awareness on the impact of emerging technologies such as AI in society and in everyday life is established in the formal curriculum of Information and Communication Technologies (ICT). Therefore, the scenario supports 9th grade ICT teachers in exploring societal concerns around the use of AI. The learning experience supports youths in reaching high-level comprehension on how STEM (science, technology, engineering, mathematics) may contribute to address public health challenges, and ethical concerns around its use, contribute to evidence-based personal decision-making, and encourage the adoption of academic curriculums and professions in the STEM field.

Estimated duration

6 classes of 40-45 minutes

Up to 12 sessions of 40-45 minutes for students projects

Classroom organization requirements

From lesson one to lesson two students work alone or occasionally in groups. The use of computer may be required. During lessons 3, 4, 5 and 6 they are asked to work in groups and the use of computer is required.

In the Project Activity the students form four- or five-member groups which conduct the school project. The use of computer is required.

Grade

9th grade (+/- 15 years old students)

Content glossary

Artificial General Intelligence (AGI) – AGI is a computational system that can perform any intellectual task a human can. Also called “Strong AI.” At this point, AGI is fictional.

Artificial Intelligence (or Weak AI) – A computational system that simulates parts of human intelligence but focuses on one narrow task. Also called narrow AI, in contrast to AGI.

Artificial Neural Network – A model for AI and machine learning inspired by the neural network configurations of the human central nervous system, especially the brain.

Data Mining – The process by which patterns are discovered within large sets of data with the goal of extracting useful information from it.

Deep Learning – The general term for to machine learning using layered (or deep) algorithms to learn patterns in data. It is most often used for supervised learning problems. In parsing a photo, layers might respond first to edges, then paws, then dogs.

Expert System - A form of AI that attempts to replicate a human’s expertise in an area, such as medical diagnosis. It combines a knowledge base with a set of hand-coded rules for applying that knowledge. Machine-learning techniques are increasingly replacing hand coding.

Machine Learning (ML) – A general term for algorithms that can learn patterns from existing data and use these patterns to make predictions or decisions with new data.

Natural Language Processing - A computer’s attempt to “understand” spoken or written language. It must parse vocabulary, grammar, and intent, and allow for variation in language use. The process often involves machine learning.

Perceptron - An early type of neural network, developed in the 1950s. It received great hype but was then shown to have limitations, suppressing interest in neural nets for years.

Supervised Learning - A type of machine learning in which the algorithm compares its outputs with the correct outputs during training. In unsupervised learning, the algorithm merely looks for patterns in a set of data.

Turing Test - A test of AI’s ability to pass as human. In Alan Turing’s original conception, an AI would be judged by its ability to converse through written text.

Unsupervised Learning – A class of machine learning algorithms that learns patterns in data without knowing outcomes. Here, the machine is presented with unlabelled data, then asked to find the intrinsic patterns in or draw its own conclusions from the data.

Source: <https://www.analyticsinsight.net/understanding-artificial-intelligence-a-comprehensive-glossary-of-terms-and-definitions/>

Pedagogical glossary

Brainstorming. Brainstorming is an instructional technique with several variations, that might take place within small groups or with the entire class. During brainstorming all students shortly express their ideas or concepts which are relevant to a given guiding question or central term. Criticism of the ideas is absent during brainstorming and its aim is the production of a lot and divergent ideas.

Collaborative learning. Collaborative learning is a didactic model that involves a set of instructional techniques, during which students cooperate and/or collaborate during the learning process, instead of the atomistic, and often rival, view of students by the traditional school. Collaborative learning can boost the learning outcomes, students’ interests and participation and their collaboration and communication skills.

Data – Any collection of information converted into a digital form.

Information. Facts, ideas, concepts, and data that have been recorded, analyzed, and organized in a way that facilitates interpretation and subsequent action.

Inquiry based learning. By the term inquiry-based learning we refer to the engagement of students in learning activities during which they practice several scientific inquiry skills. Students make use of these skills in order to answer scientific questions either posed by the students themselves or by the teacher, by the handling of authentic data, either experimentally collected by themselves or given already collected. Some common inquiry skills include constructing and using models, carrying out

experiments, data collection and organisation, variable handling, data driven conclusion making and communicating over scientific issues.

Lifelong learning. A broad concept where education that is flexible, diverse, and available at different times and places is pursued throughout life. It takes place at all levels—formal, non-formal and informal—utilizing various modalities such as distance learning and conventional learning.

Project based learning. Project based learning is an instructional model of active learning. It has several forms, during which students work in groups on the development of projects, which often refer to authentic problems or situations approaching real life conditions. Project based learning includes the phases of project initiation, project development and project presentation.

Indicative literature

Russell, Stuart, and Norvig, Peter. Artificial Intelligence: A Modern Approach, 4th. Edition, Prentice Hall, 2020.

Elaine Rich, Kevin Knight; Artificial intelligence. ISBN: 0-07-100894-2

Hands-On Chatbots and Conversational UI Development: Build chatbots and voice user interfaces with Chatfuel, Dialogflow, Microsoft Bot Framework, Twilio, and Alexa Skills (book ISBN-13: 978-1788294669 ISBN-10: 1788294661)

Competences / Learning Goals

Key Competences

STEM / Personal, social, and learning to learn, citizenship.

Knowledge

Computer science, software engineering and technology concepts:

- Artificial Intelligence (AI) - what AI is and the different ways to build intelligent Systems.
- Machine Learning (ML)
- AI applications in healthcare systems

Social concepts and global concerns:

- Role of AI and ML in society (in particular in epidemic outbreaks)

Knowledge - outcome assessment:

1. Defines relevant concepts of artificial intelligence.
2. Recognizes the limits of AI.
3. Recognizes the importance of AI in Healthcare
4. Characterizes Intelligence Interfaces
5. Characterize chatbots and understand their role in the healthcare sector.

Skills (abilities/competences)

General: curiosity; collaboration; critical thinking; self-awareness, citizenship

Specific:

- Obtaining, assessing, and communicating evidence related to Artificial Intelligence Systems
- Applying the main approaches used in building Virtual Agents to build a system that serves public health.
- Understanding the appropriate strategies and techniques to build a bot for healthcare.
- Analyzing possible consequences of not investing in technology in a situation of pandemic outbreak
- Understanding the advantages and concerns of using AI systems in public health

Skills – outcome assessment:

1. Selects appropriate sources to characterize AI systems from a STEM perspective.
2. Selects appropriate techniques and methods to develop a simple AI System.
3. Can develop a simple AI system to fight epidemic outbreaks.
4. Can propose concrete AI-based software development actions to fight epidemic outbreaks.
5. Can anticipate the consequences of inappropriate use of AI systems in epidemic outbreaks.

Affective /Attitudes/Behaviour (*beliefs*)

General:

- Intellectual curiosity (simulators are adequate for nowadays students and they are keen to use them).
- Respect for plurality of viewpoints (there is no bad idea or stupid observation).
- Collaboration (the collaborative work is critical).
- Teamwork (the project involves students and brings complicity that will be reflected in the rest of the school activities).
- Team support (the project “runs as fast as the lowest mate”: in the different stages there will be the need to backing someone).
- Return to basic (the need to explain to other concepts that are basic for some).

Specific:

- Adopting attitudes supporting the use of AI in public health.
- Engaging discourse on the risks and opportunities of using AI systems in public health.
- Engaging in public speaking and debating of measures to boost the use of AI in public. health, particularly in the emergence of epidemic outbreaks.
- Engaging in public speaking and debating the role of software in the development of advanced responses for public health, with a particular focus on AI systems.

Attitudes and behavior - outcome assessment:

1. Believes that AI systems are important in healthcare and is committed to contribute for it. Believes that working on computer science and AI is relevant for healthcare. Believes that collaborative work is critical to overcome obstacles and problems.
2. Believes that efforts should be made to have the best technologies in healthcare.
3. Considers that respect for the plurality of points of view is crucial to obtain good and lasting solutions.
4. Attitudes towards AI

Learning goals and outcomes

- Applies appropriate methods and techniques to develop simple AI systems for public health.
- Incorporates Artificial Intelligence strategies in web applications.
- Identifies philosophic questions that can emerge from the use of AI.
- Identifies possible applications of AI in public health.
- Uses evidence-based argumentation to promote the use of AI in public health.
- Analyzes possible consequences of inappropriate use of AI in public health.
- Uses evidence-based argumentation to discuss concerns around the use of AI in public health.

Assessment methods

- ✓ Outcome assessment
 - Quantitative - questionnaire in paper - Assessment Questionnaire- Knowledge, Skills, Beliefs, attitudes, and behavior
 - Qualitative - students project: development of a bot, its integration in a mini website
- ✓ Process assessment - *assessment of the teaching-learning sequence* – observation grid: reaching the target audience, and extent; implementation of the scenario as planned; run of the learning scenario as expected/organizational issues to be solved; duration of the teaching-learning sequence; number

of people exposed; score for likeability – students (“how fun was it to do”/ how fun would be to do again/ how could it be better).

Content (relevant to learning goals & research topics)

STEM content

- Importance and general consequences of epidemic outbreaks for society
- Artificial Intelligence
- Concepts of Human Computing Interface (HCI)
- Innovative computer science
- Emerging AI in healthcare settings
- Quality and reliability of information systems

Non-STEM content

- Digital literacy
- Societal concerns around the development of AI systems

Digital Learning Objects (LO) and Digital Educational Resources (DER)

New:

Resources for teachers to support theoretical and practical AI subjects, including smart bot construction.

- Learning object: What is Artificial Intelligence? (infographic) (ppt file) [LO1-https://1drv.ms/p/s!Aiww0ErooSWOlkV4wO-yrDU_TMSI?e=KDS3gh]
- Learning object: AI in healthcare (infographic) (ppt file) [LO2-<https://1drv.ms/p/s!Aiww0ErooSWOlkFL2MGv8skIf5OB?e=fFHUN1>]
- Learning object: Intelligence User Interfaces concepts (infographic) [LO3-<https://1drv.ms/p/s!Aiww0ErooSWOlkZw5VLP1aI1RvI?e=rHz8Sy>]
- Learning object: Implementation Manual (how to build a bot integrated in a mini web site) [LO4-OA4-<https://1drv.ms/w/s!Aiww0ErooSWOlkhVAitiZTNO7ZzU?e=jWPLau>]
- Learning object: Chatbot Ai source code [[LO5](#)]
- Learning object: Mini website template - Template for building a mini web site (HTML and CSS) [[LO6](#)]

From other sources/high-quality selected platforms:

Artificial Intelligence

[What is artificial intelligence \(AI\)?](#)

[Introduction to AI](#)

[Turing Test – Stanford](#)

[Chinese Room](#)

[Azure Health Bot](#)

[Podcast - Building the Future - AI Portugal - Spotify](#)

[AI News](#)

Intelligence User Interfaces

[Siri](#)

[Alexa](#)

[Cortana](#)

Websites

[10 Best Website Builders](#)

[Wix](#)

Chatbots

[Top 6 Use Cases & Examples of Chatbots in Healthcare in 2022](#)

[Patient Satisfaction for COVID-19 Chatbots Comes With Conditions](#)

[Using AI, Chatbots to Drive Seamless Patient Experiences, Access](#)

[Example 1: Healthcare Chatbots](#)

[Example 2: Symptomate - symptom checker. Medical app for online self-diagnosis.](#)

[How to Make a Chatbot in Python Step by Step](#)

[DialogFlow](#)

[How to Integrate Dialogflow with Website](#)

[2019 Novel Coronavirus \(2019-nCoV\),](#)

[COVID-19 Symptoms - LabXchange](#)

[Get Tested for COVID-19 - Providance](#)

[Coronavirus \(COVID-19\) Information - Virginia Mason Health System](#)

Complementary resources:

- Hands-On Chatbots and Conversational UI Development: Build chatbots and voice user interfaces with Chatfuel, Dialogflow, Microsoft Bot Framework, Twilio, and Alexa Skills (book ISBN-13: 978-1788294669 ISBN-10: 1788294661)
- Building Chatbots with Python: Using Natural Language Processing and Machine Learning 1st ed. Edition (book ISBN-13: 978-1484240953 ISBN-10: 1484240952)
- Other multimedia content (e.g.: videos, photos) taking by the project team in the working environment, during the professor workshops, classroom, and outside classroom enactments.

Teaching -learning activities

Principal target:

ICT classes

9th grade (+/- 15 years old students)

6 sessions/classes of 40-45 minutes

ICT teachers integrate other colleagues in the enactment of the scenario (e.g., science, visual education, mathematics and english teachers), as it aims to be interdisciplinary and innovative.

A variety of instructional strategies will be applied, including exposure and demonstration with step-by-step examples (with and without software), questions and answers. The sessions include presentation of concepts and methodologies, examples, discussion and interpretation of results. The practical component is geared towards building a mini web site and a bot, including discussion and interpretation of results.

Lesson 1: Artificial Intelligence

The teaching-learning script starts with a question “what is Artificial Intelligence (AI)”?

After posing the question, three or four students are asked for their opinion on what they think AI is.

Next, the teacher shows an image of robot sitting on a rock that seems to be thinking about something and poses a new question “The machines can think”?

➤ brainstorming on the question “The machine can think?”

Students are asked to make a justified vote (yes or no) on the question "if the machine can think".

The teacher records the vote on a board and then summarizes the arguments for and against.

After, the teacher explains:

- The Turing test, - the most famous test related to Artificial Intelligence capabilities. Its purpose is to test the machine's ability to express intelligent behavior indistinguishable from that of a human. The test can be summarized as follows: a remote human interrogator, within a fixed time frame, must distinguish between a computer and a human subject based on their replies to various questions posed by the interrogator. By means of a series of such tests, a computer's success at “thinking” can be measured by its probability of being misidentified as the human subject.

- <https://plato.stanford.edu/entries/turing-test/>
“Chinese room” argument - a powerful rejoinder to the idea that the Turing test can show that a machine could think. Suppose a human who knows no Chinese is locked in a room with a large set of Chinese characters and a manual that shows how to match questions in Chinese with appropriate responses from the set of Chinese characters. The room has a slot through which Chinese speakers can insert questions in Chinese and another slot through which the human can push out the appropriate responses from the manual. To the Chinese speakers outside, the room has passed the Turing test. However, since the human does not know Chinese and is just following the manual, no actual thinking is happening.
<https://plato.stanford.edu/entries/chinese-room/>

- The following Digital Learning Object should be used at this stage: What is Artificial Intelligence? (infographic) [LO1]

The professor presents some areas of health where knowledge, reasoning, and the ability to process information are very relevant. E.g., diagnosis, treatment protocol development, drug development, personalized medicine and patient monitoring and care.

AI technologies have the potential to transform many aspects of patient care, as well as administrative processes within provider, payer, and pharmaceutical organisations. There are already several research studies suggesting that AI may perform as well or better than humans on key health tasks such as diagnosing disease. Today, algorithms are already outperforming radiologists in detecting malignant tumors and advising researchers on how best to build clinical trials. However, there are several barriers to the rapid implementation of AI in healthcare, for example ethics.

- The following Digital Learning Object should be used at this stage: AI in healthcare (infographic) [LO1]
- Debate on the question “How can AI benefit the healthcare industry?”
- Complementary Resources:
Podcast - Medical Diagnosis Assisted by Artificial Intelligence
<https://popcasts.pt/diagnosticos-medicos-assistidos-por-ia-convidada-joana-rocha/>

Lesson 2: Intelligence Interfaces

- Intelligence Interfaces concepts

The teacher starts by introducing Intelligence Interfaces as an Intelligent personal support tool that is one of the main applications of artificial intelligence. Usually, they are software agents capable of performing tasks or services based on commands or questions, which can be provided by text or voice. Then, the teacher presents some famous examples: Siri, Alexa, and Cortana.

- debate on the question “Are these Intelligence Interfaces useful? How & Why?”

One type of Intelligence Interfaces is a chatbot. Generally, literature uses several terms as synonyms for "chatbots". These terms include "virtual assistants", "digital assistants", "conversation agents", "chatterbots" or "natural dialogue systems" among others, although they are all used interchangeably to describe conversation systems using natural language.

- debate on the question “What does a chatbot do?”

- It is a system that just answers simple questions to exclude people about symptoms (for instance, of COVID-19), care they should have, procedures to follow... or is more than this?
- It can be a way to free human helplines for cases of medical diagnosis.
- It can be a form of screening and act as the first line of clarification.
- Could it be a powerful tool to combat miss-information and manage the panic generated by the chains of shares on social networks?
- “*Bot, you are not a doctor, but could you be?*”

- The following Digital Learning Object should be used at this stage: Intelligence User Interfaces concepts (infographic) [LO3]
- Complementary Resources on Chatbots examples
[Siri](#)
[Alexa](#)
[Cortana](#)
- Complementary Resources on Healthcare Chatbots
[AI News – Four major impacts of artificial intelligence on healthcare](#)
[Top 6 Use Cases & Examples of Chatbots in Healthcare in 2022](#)
[Patient Satisfaction for COVID-19 Chatbots Comes With Conditions](#)
[Using AI, Chatbots to Drive Seamless Patient Experiences, Access](#)
[Example 1: Healthcare Chatbots](#)
[Example 2: Symptomate - symptom checker. Medical app for online self-diagnosis.](#)

Lesson 3-6: Building Chatbot

Students have an overview of the main steps to build a Chatbot.

- 1 - Planning the Purpose of Chatbot (Collect inquiries and FAQs, Group the intentions and Provide responses)
- 2- Setup
- 3- Building Chatbot
- 4 -Deploying Chatbot

Then, by doing a step-by-step tutorial will learn how to build a Basic Dialogflow Chatbot.

Learning objects on Building Chatbot

- The following Digital Learning Objects should be used at this stage: AI in healthcare (infographic) [LO4, [LO5](#), [LO6](#)]

By following the step-by-step instructions of the implementation Manual [[LO4](#)] students will learn how to build a Dialogflow Chatbot and integrate it in a website.

Then, students creatively customize a website template that incorporates the chatbot.

- Complementary Resources on Building Chatbot (video and tutorial)
[Video](#)
[Tutorial](#)
[How to Make a Chatbot in Python Step by Step](#)
[DialogFlow](#)
[How to Integrate Dialogflow with Website](#)
- Complementary Resources on building websites (Website templates)
[10 Best Website Builders](#)
[Wix](#)
- Complementary Resources on how to integrate the Chatbot on the website (tutorial)
[How to Integrate Dialogflow with Website](#)
- Quantitative assessment – questionnaire - Knowledge, Skills, Beliefs, attitudes, and behavior
- Presentation and Activity in groups (also works as qualitative assessment):

Students must present their chatbots and for each presentation, in groups, the other students need to identify which information, dialogs were used, or which other solutions may be used to improve the object presented.

After building and presenting the bot students are challenged to build other chatbot in groupwork. This is the **school Project** described below, in the autonomous section.

Supplementary learning resources and educational activities

The most important supplementary educational activities are the School Research Project, which has the challenge to build a Chatbot to address the actions to be taken when symptoms appear, but, generally, during some of the sessions devoted to the development of the research project), the following activities may be organized:

- Conference with STEM professionals

The conference may be organized at the school or stakeholder location and promotes an interaction between students and STEM professionals, such as medical experts, policy makers, public health authorities, officer of the municipality working on urban and environmental health, data scientists, technology developers, researchers of PAFSE consortium.

Students are oriented by the teacher to pose questions to the experts with a particular focus on:

- a) academic choices and career paths.
- b) reasons to adopt a career that contributes to better public health.
- c) identifying actions to fight NCDs in their community. for better expectancy and quality of life for all.

- Visits to organizations interested in STEM and public health education:

FCT NOVA (visit to laboratories)

<https://www.fct.unl.pt/>

SILab (visit to the Social Innovation Laboratory of Instituto Superior Técnico – University of Lisbon)

<http://silab.tecnico.ulisboa.pt/>

ATEC – Training Center – visit to the Academy to present professional training of a technical nature

<https://www.atec.pt/>

Escola Nacional de Saúde Pública (<https://www.ensp.unl.pt/>) – activity on STEM myths and professions with challenges on SDG 3 (in relation to others) and guests from various areas and from other institutions such as Chaperone (<https://chaperone.online>) and ICNOVA (<https://www.icnova.fcsh.unl.pt/en/homepage-2/>)

(The list of partnerships will continue to be updated until the end of the project. You can consult all our partnerships here: <https://pafse.eu/pt/partes-interessadas-pafse/>)

School Research Project

Topics

- Major communicable diseases. H2019 Novel Coronavirus (2019-nCoV), Measles, Mumps, Zika Virus, Pertussis, Influenza
- CDs Symptoms

- Artificial Intelligence
- Building Chatbot
- Quality and reliability of Information Systems
- Scientific literacy, fact-checking techniques, quality of information sources

Estimated duration. The school research project starts after lesson five and has an estimated duration of 5-6 sessions of 45 minutes.

Research management, design, and administration

Students are organized in groups. The project challenges each group of students to create and present a website that contains a chatbot that helps people decide what to do when they have symptoms. They must integrate the knowledge obtained during the teaching-learning sequence and ideas emerged during the meetings with experts.

Connections with STEM curriculums and careers

During the development of the Research Project is relevant to organize:

1. **Classroom visits** by IT professionals, healthcare professionals, project managers, software developers, or **Teleconferences** with data scientists or technology developers, researchers of PAFSE consortium, among others. Students make questions to experts with a particular focus on a) future academic choices and career paths in the STEM field; b) identifying how AI technologies benefit the healthcare industry.
2. **Production of multimedia content** (photos, videos)
3. **Competition and reward** of best website and chatbot

Teaching-learning process milestones:

1. Students will be able to propose solutions based on chatbots for healthcare contexts.
2. Students will be able to identify and communicate the importance of the role of AI in society and, in particular, in healthcare.
3. Students will be able to use technical argumentation to justify policy choices.

Teaching-learning process for school project (summary):

1. Development of materials (videos, tutorials, pictures).
2. Website and chatbot.
3. Presentation of the Website and chatbot in open schooling event.

Organization of the open schooling event:

1. Each project output (website and bot) is presented by the students in a community setting (e.g., local server or through computers placed in exposition centers, garden, museum, science fair).
2. Students will prepare a pitch on how AI and chatbots can address public health challenges. Technical speeches to motivate peers to new technologies and environments.
3. Students, parents, school community and relevant local stakeholders attend the event and are introduced on the topic on how AI can be used to address challenges.

Data Analysis and Reporting

Content Analysis; Descriptive statistics; Data presentation formats; Report writing, Development of presentation.

Target Audience for Recommendations

School community and local stakeholders: students, parents, municipalities, healthcare providers, local enterprises

Public Debate and Recommendations (based on research results)

Public presentation of the website and chatbot and dissemination of evidence-based recommendations via social, community and mainstream media. Release report and recommendations for public consultation.

Main Partner responsible: UNL (Information Management School)

Assessment Questionnaire- Knowledge, Skills, Beliefs, attitudes, and behavior

Scenario topic: “Artificial Intelligence responses when clinical symptoms appear.”

Knowledge	
1. Defines relevant concepts of artificial intelligence.	<p>Question 1.1: What is Artificial Intelligence? A) A type of films of action. B) An extension of the brain. C) An area of Computer Science. D) Does not exist.</p> <p>Question 1.2: Which of the following options regarding Artificial Intelligence (AI) is true? A) The object of study of AI is the functioning of the brain. B) The AI is a patent of an American company. C) The object of study of AI is to understand and build intelligent entities. D) AI is a fiction promoted by the media.</p> <p>Question 1.3: The concept of Artificial Intelligence was born in: A) 1956. B) 1980. C) 2016. D) There is no specified year.</p>
2. Recognizes the limits of AI	<p>Question 2.1: What can NOT be said about the Turing test: A) Its purpose is to test the machine's ability to express intelligent behavior. B) The test can include a remote human interrogator. C) The test includes a remote computer interrogator. D) The human interrogator must distinguish between a computer and a human based on their replies to various posed questions.</p> <p>Question 2.2: The “Chinese room” argument is related to: A) A Chinese who wanted to learn AI. B) Chinese life in cities. C) Reject the idea that the Turing test can show that a machine could think. D) Learning to speak Chinese.</p>
3. Recognizes the importance of AI in Healthcare	<p>Question 3.1: Today Artificial Intelligence (AI) technologies DO NOT: A) Help diagnosis. B) Help treatment protocol development. C) Replace doctors. D) Help personalized medicine and patient monitoring and care.</p> <p>Question 3.2: There are several barriers to the rapid implementation of Artificial Intelligence (AI) in healthcare. A good example is: A) Poor quality of algorithms. B) Lack of computers in hospitals. C) Ethical problems. D) Doctors strike against AI.</p>
4. Characterizes Intelligence Interfaces	<p>Question 4.1: What can NOT be said about Intelligence Interfaces: A) They use applications of artificial intelligence. B) They can perform tasks or services based on commands or questions. C) They can use text, images, or voice. D) They can't be used in chatbots.</p> <p>Question 4.2: A good example of an Intelligence Interface is: A) Alexa.</p>

	<p>B) Google. C) MS Excel. D) Internet Explorer.</p>
<p>5. Characterizes chatbots and understands its role in the healthcare sector.</p>	<p>Question 5.1: A Chatbot is: A) A system that only answers simple questions. B) A type of robot. C) A website functionality. D) A computer program designed to simulate conversations with human users, especially over the internet.</p> <p>Question 5.2: Generally, the literature uses several terms as synonyms for "chatbots". These terms DO NOT include: A) Virtual assistants. B) Virtual Reality. C) Digital assistants. D) Conversation agents.</p> <p>Question 5.3: The use of chatbots in the health sector DOES NOT allow: A) a form of free humanized care for medical diagnosis cases. B) totally replacing doctors. C) combating the lack of information and managing the panic generated by the chains of shares on social networks. D) a form of rapid triage and act as a first line of clarification.</p>
SKILLS	
<p>1. Selects appropriate sources to characterize AI systems in a STEM perspective</p>	<p>Question 1.1: Which data sources should we use to characterize Artificial Intelligence systems? A) Newspapers. B) Scientific databases. C) Data retrieved by google searches.</p>
<p>2. Selects appropriate techniques and methods to develop a simple AI System.</p>	<p>Question 2.1: What are the most important techniques to develop an Artificial Intelligence system? A) Drawing Techniques. B) Programming Techniques. C) Writing Techniques. D) Database Techniques.</p> <p>Question 2.2: Which individual actions can be taken to become an Artificial Intelligence expert? (Select all that are appropriate) A) Learn Mathematics. B) Learn to program computers. C) Read science fiction books. D) Learn Robotics.</p>
<p>3. Can develop a simple AI system to fight epidemic outbreaks</p>	<p>Question 3.1: I'm able to plan a simple Artificial Intelligence system to fight epidemic outbreaks: 1) definitely true... 5) definitely false.</p> <p>Question 3.2 I'm able to develop a simple Artificial Intelligence system to fight epidemic outbreaks: 1) definitely true... 5) definitively false.</p>
<p>4. Can propose concrete AI-based software development</p>	<p>Question 4.1 It CANNOT be said that AI-based software development can help fighting epidemic outbreaks in the following case: A) Helping to predict contagions.</p>

<p>actions to fight epidemic outbreaks</p>	<p>B) Healing the sick. C) Helping to build more effective vaccines. D) Helping to make better diagnoses.</p> <p>Question 4.2 I feel able to identify areas of use of Artificial Intelligence that support the improvement of healthcare services: 1) definitely false... 5) definitely true.</p>
<p>5. Can anticipate the consequences of inappropriate use of AI systems in epidemic outbreaks.</p>	<p>Question 5.1 A good example of misuse of AI systems in epidemic outbreaks is: A) Help predict infections. B) Help build more effective vaccines. C) Use of AI for surveillance purposes (such as detecting new Covid-19 cases and gathering data from healthy and ill individuals) D) Help make better diagnoses.</p> <p>Question 5.2 Misuse of Artificial Intelligence systems in epidemic outbreaks can threaten individual privacy: 1) strongly disagree... 5) strongly agree.</p>
<p>Beliefs, attitudes and behavior</p>	<p>Include: There are no correct or incorrect answers; we are only interested in knowing your perspective.</p>
<p>1. Believes that AI systems are important in healthcare and is committed to contribute for it.</p>	<p>Question 1.1 I believe that Artificial Intelligence systems are important in healthcare: 1) strongly disagree... 5) strongly agree.</p> <p>Question 1.2 I am interested in imagining and designing Artificial Intelligence systems for healthcare: 1) Extremely unlikely... 5) Extremely likely.</p> <p>Question 1.3: For me working on an Artificial Intelligence system, in the next three months, would be: 1) Bad... 5) Good.</p> <p>Question 1.4: For me working on an Artificial Intelligence system, in the next three months, would be: 1) useless... 5) useful.</p> <p>Question 1.5 I plan to work on an Artificial Intelligence project in the next three months: 1) definitely true... 5) definitively false.</p>
<p>2. Believes that working on computer science and AI is relevant for healthcare.</p>	<p>Question 2.1 I believe that work in the field of Artificial Intelligence has: 1) <i>No influence</i>... 5) <i>Complete influence</i> over the most important challenges that society faces in healthcare.</p> <p>Question 2.2 My community thinks that developing Artificial Intelligence systems is relevant for healthcare: 1) Extremely unlikely... 5) Extremely likely.</p>
<p>3. Believes that the collaborative work is critical to overcome obstacles and problems</p>	<p>Question 3.1 I believe that teamwork is important to overcome obstacles and solve problems: 1) strongly disagree... 5) strongly agree.</p> <p>Question 3.2 I believe that is easier to identify obstacles and solve problems through team discussions: 1) I totally disagree... 5) I totally agree.</p>

<p>4. Believes that efforts should be made to have the best technologies in healthcare</p>	<p>Question 4.1 I believe that is important to develop and use the best Artificial Intelligence (AI) technologies in healthcare: 1) strongly disagree... 5) strongly agree.</p> <p>Question 4.2 It is possible to employ efforts in developing AI technologies for healthcare services. 1) strongly disagree... 5) strongly agree.</p> <p>Question 4.3 It is common knowledge that it is necessary to invest money in AI technology for healthcare services. 1) strongly disagree... 5) strongly agree.</p>
<p>5. - Considers that respect for the plurality of points of view is crucial to obtain good and lasting solutions.</p>	<p>Question 5.1 I respect my colleagues' views because it helps me to develop a better work: 1) Strongly disagree... 5) Strongly agree.</p> <p>Question 5.2 In the process of developing a solution, I hear opinions different from mine without interrupting: 1) Strongly disagree... 5) Strongly agree.</p> <p>Question 5.3 I listen to many different points of view because is important to obtain good and lasting solutions: 1) Strongly disagree... 5) Strongly agree.</p>
<p>6. Attitudes towards AI</p>	<p>Question 6.1 For me to use AI is harmful: ____: ____: ____: ____: ____: beneficial pleasant: ____: ____: ____: ____: ____: unpleasant good: ____: ____: ____: ____: ____: bad worthless: ____: ____: ____: ____: ____: valuable enjoyable: ____: ____: ____: ____: ____: unenjoyable</p>