

ANATOMY AND PHYSIOLOGY 12: AI in Health Care

Summary of Learning Opportunity

In this Nature of Science-based learning opportunity, we pull back the “hospital” curtain to investigate the model of personalized health care (Snyderman, 2012). Students are guided to collate resources and extract, summarize and synthesize information using graphic organizers to generate ideas about what health care may look like in the future for themselves and for society. Students participate in a Café Scientifique in which they discuss and debate the benefits and limitations of personalized health care, culminating in writing a position statement for their potential use as global citizens and, for some, as future health care providers.

Artificial intelligence plays a role in personalized health care and has the potential to assist in predicting health risks, determining and predicting the progression of diseases and targeting potential therapies for the patient. This use of technology must be balanced by health care professionals who consider ethical and privacy concerns as well as communicating information to the patient in a collaborative manner that promotes self-efficacy.

Anatomy and Physiology 12

Learning Standards

- Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal, local or global interest
- Critically analyze the validity of information in primary and secondary sources and evaluate the approaches used to solve problems
- Assess risks in the context of personal safety and social responsibility
- Contribute to finding solutions to problems at a local and/or global level through inquiry
- Communicate scientific ideas and information and, perhaps, a suggested course of action, for a specific purpose and audience, constructing evidence-based arguments and using appropriate scientific language, conventions and representations
- Lifestyle differences and their effects on human health
- Holistic approach to health

Literacy Connections	Instruction and Assessment	Competencies Developed, Practiced and/or Assessed
Comprehends Texts: Interprets texts Applies Understanding: Extracts ideas and information, Synthesizes ideas and information	1. Students are introduced to the learning opportunity, a Café Scientifique discussion around the question “Would you recommend personalized health care to your family, friends or self if some of the information was generated by artificial intelligence? Why or why not?” Students gather information regarding this topic. Suggested activities to support the research process: • Students read curated articles (see below) • Students are taught to use the article references to find additional sources • Students are introduced to and can choose to use a variety of graphic organizers to support the research process, including summarizing and extracting information from one source, synthesizing ideas from multiple sources, evaluating the authors’ possible biases and making inferences based on evidence presented in a source • Students can explore the use of AI-based literature review tools to assist them in summarizing, extracting information, inferring and synthesizing academic journal articles • Students collaborate with a partner or small group to compare their and others’ synthesis to the AI-generated content • Students could interview a physician or health care provider who uses an AI-based health care tool • Students can explore tools for personalized health care for themselves, taking care to note personal privacy and health data management concerns ○ Docus ○ Med-PaLM ○ DynaMed ○ MDCalc ○ Epocrates	Critically analyze the validity of information in primary and secondary sources and evaluate the approaches used to solve problems Assess risks in the context of personal safety and social responsibility Lifestyle differences and their effects on human health Holistic approach to health

Communicates: Expresses ideas and information, Justifies and defends decisions and/or ideas

2. In the Café Scientifique, students discuss their research and debate the inquiry question with classmates. Students bring their research notes and graphic organizers and are encouraged to take note of their classmates' opinions.

Tea, coffee and snacks are served, like in a café setting.

Communicate scientific ideas and information and, perhaps, a suggested course of action, for a specific purpose and audience, constructing evidence-based arguments and using appropriate scientific language, conventions and representations

Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal, local or global interest

Communicates: Expresses ideas and information, Justifies and defends decisions and/or ideas

3. Students write a position statement responding to the discussion question. Students use their research, notes and quotes from their conversations with their peers during the Café Scientifique as evidence to support their assertion.

The teacher uses observations of students' research process and discussions during the Café Scientifique, and their written position statement to inform their assessment of the learning standards.

Contribute to finding solutions to problems at a local and/or global level through inquiry

Communicate scientific ideas and information and, perhaps, a suggested course of action, for a specific purpose and audience, constructing evidence-based arguments and using appropriate scientific language, conventions and representations

Notes on Assessment

By focusing on students' development and demonstration of curricular competencies throughout the entire learning process, including the final product (the written position statement), the teacher is able to gather evidence of each student's own scientific thinking and communication skills. The teacher can take note of the student's research process, conversations with peers during the research phase, observations of the student's skills in communication and collaboration during the Café Scientifique, the student's argument for or against the use of AI in health care as well as the student's use of supporting evidence for their argument. In assessing in a holistic way, the teacher can ensure that the student's conclusions are their own and not the work of artificial intelligence itself.

Suggested Resources

Snyderman R. Personalized health care: from theory to practice. *Biotechnol J*. 2012 Aug;7(8):973-9. doi: 10.1002/biot.201100297. Epub 2011 Dec 16. PMID: 22180345.

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Rigby, M.J. Ethical Dimensions of Using Artificial Intelligence in Health Care. *AMA J Ethics*. 2019;21(2):E121-124. doi: 10.1001/amajethics.2019.121.

Weijers M, Bastiaenen C, Feron F, Schröder K. Designing a Personalized Health Dashboard: Interdisciplinary and Participatory Approach. *JMIR Form Res*. 2021 Feb 9;5(2):e24061. doi: 10.2196/24061. PMID: 33560229; PMCID: PMC7902185.

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