Artificial Intelligence in Health Professions Education

Kate Donovan, Dennis Daniel, Martin Pusic
Boston Children’s Hospital Academy
Disclosures

- Martin receives funding from the AMA Reimagining Residency Initiative and receives salary support from the ABMS

- Kate and Dennis do not have disclosures
To receive credit for today’s BCH Academy Seminar:

Text 4306 ➔ 617-648-7950
How can AI be used by health professions educators to enhance HPE?
Wicked Problems

- No clear solution
- Socially Complex
- Changing behavior
- Difficult to define
- Organizational boundaries
  - and responsibilities
  - Multi-causal
  - Interdependencies
- Intractable with chronic Policy failure
- Solution can lead to unforeseen consequences

Definition

Wicked Problems

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Solutions

How can AI be used by HP educators to enhance HPE?
How Schools Can Survive (and Maybe Even Thrive) With A.I. This Fall

By Kevin Roose

Aug. 24, 2023

Step 1: Assume all students are going
Not optional the way SoMe is

Instagram
twitter
facebook

ChatGPT
Step 2: Eliminate the “students are c
## Use Cases

<table>
<thead>
<tr>
<th>Method</th>
<th>Old Way</th>
<th>AI Way</th>
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<tr>
<td>Flashcards</td>
<td>User-generated/scheduled</td>
<td>AI generated/scheduled</td>
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<td>Virtual patients</td>
<td>Predetermined</td>
<td>Interactive adapt-on-the-fly customizations</td>
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<td>Look-up</td>
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<td>Differential Diagnosis</td>
<td>Static lists</td>
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<td>Patient-Learner-Knowledge</td>
<td>Back-room lookup</td>
<td>Dynamic three-way interactions</td>
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</table>

Please generate a 3 column table comparing and contrasting how AI enabled studying by medical students differs from traditional methods. For example, how are flashcards used/generated differently with AI? How does using AI differ from traditional textbooks. How do virtual cases differ?
THE SHIFT

How Schools Can Survive (and Maybe Even Thrive) With A.I. This Fall

Step 3: Focus on the STRENGTHS and not the weaknesses.
My Clinical ChatGPT Story
That likeable senior resident that you don’t (yet) trust.
Pretend you are an 8-year-old child with a high fever, sore throat, and difficulty swallowing. Do not tell me the specific diagnosis. Let me ask you questions and elicit physical findings that could lead to an appropriate management plan. Ready?

Absolutely, I'll simulate the role of the 8-year-old with those symptoms.

*In a child-like voice:* "Hi, I don't feel good. My throat hurts a lot."

Go ahead and ask your questions.

What's been going on?

"My throat started hurting a couple of days ago. It's gotten really bad, and now it's hard for me to swallow. I've been feeling really hot too, and mommy said I have a fever. I just want to lie down all the time, and I don't feel like playing or eating."
How high has the fever been?

"Mommy used a thermometer and said it was 103°F yesterday. She looked worried. I've been feeling really hot and shivery."

Can you swallow liquids?

"It hurts when I try. I tried drinking some water earlier, but it made my throat hurt more, so I didn't drink much. I feel thirsty though."
Alright. Let's simulate that.

After checking the vital signs, you find:

- **Temperature**: 103.2°F (39.6°C)
- **Heart rate**: 110 beats per minute (elevated for age, likely secondary to fever)
- **Respiratory rate**: 24 breaths per minute (within normal limits for age)
- **Blood pressure**: 100/60 mmHg (normal for age)
- **Oxygen saturation**: 98% on room air

The child appears uncomfortable, with a clear preference for not moving the neck too much and appears slightly dehydrated.

How would you like to proceed?
Is there any stridor? Is the patient drooling?

"No, I don't have any noisy breathing. But I do feel like there's a lot of spit in my mouth. I don't want to swallow because it hurts too much, so I've been spitting it out sometimes."

I do a physical examination and in particular I look to see if the uvula is midline, what the tonsils look like and whether there is any tonsillar swelling.

Upon examination:

- The child appears to be in mild distress, mainly from discomfort.
- **Uvula**: It is deviated to one side.
- **Tonsils**: One tonsil is significantly larger than the other and appears inflamed and reddened with some white exudate. The swollen tonsil is pushing the uvula to the opposite side.
- **Pharynx**: The rest of the throat is erythematous.
- **Neck**: There's tender and enlarged anterior cervical lymphadenopathy on the side of the enlarged tonsil.

Given the findings, you can now decide on the appropriate management plan.
Step 4: Gain personal experience.
Learning Analytics

Learning Science

Computer Science

Data Science

Statistics

Pusic, Birnbaum et al  JCEHP 2020
CHAT - GPT

Natural language processing + Iteration

Generative Pre-trained Transformer
Clinical
- DDx – a different kind of Up-to-Date
- Discharge instructions by reading level, language, length

Recursive prompting
- “Improve the following prompt: “xx”
- “What mistakes do clinicians make when developing prompts? ...when using ChatGPT”

Output in tables
- “Generate a 3 column table comparing and contrasting Design thinking with Design-based research”
Medical education and training

Developing educational materials for medical professionals

1. Prompt: "Create an educational resource about [medical condition] for medical professionals. Give me 3 examples. You have 250 words max for each resource."

2. Prompt: "Design a training module outline for a new treatment approach for [medical condition]. Provide 3 examples, each within 200 words."
00 Prompts for Clinicians
70 ChatGPT Prompts for Medical Students to Develop Skills

Basic Medical Knowledge

- Explain the role of the hypothalamus in the endocrine system.
- Describe the structure and function of the nephron.
- Compare the functions of the sympathetic and parasympathetic nervous systems.

Clinical Skills

- What are the key questions to ask when taking a history of present illness for chest pain?
- Describe the components of a comprehensive review of systems.
- How to elicit a complete past medical history from a patient?
0 Prompts for Students

“Give a person a fish, feed them for a day.
Teach a person to fish, feed them for their lifetime”

“Give a person a PROMPT…..”

Maimonedes
Step 5: This coming academic year and transition.
The Hype Cycle

Fenn and Linden, 2003
Pusic and Ellaway, 2023
Adaptive Expertise

Optimal Adaptability Corridor
It's a Fan!

It's a Wall!

It's a Snake!

It's a Rope!

It's a Tree!