


Using Artificial Intelligence to Develop Educational Content for Teaching Children on Cardiopulmonary Resuscitation

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Abbreviations:

AI: artificial intelligence
CPR: cardiopulmonary resuscitation
GPT: Generative Pre-Trained Transformer
OHCA: out-of-hospital cardiac arrest

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Dear Editor,

Children make up around 25% of the total world population and therefore constitute a colossal (two-billion)¹ contingent of potential rescuers that could greatly enhance community response in out-of-hospital cardiac arrest (OHCA). Considering the high motivation of children to learn cardiopulmonary resuscitation (CPR) and their ability to transfer the life-saving competencies to other people, teaching all school children in resuscitation is currently strongly endorsed by international health organizations as one of the key public initiatives for improving bystander CPR rates and survival after OHCA.^{2,3}

In 2015, it has been recommended to teach school children in resuscitation annually from the age of 12 years or less.² A recent scientific statement by the International Liaison Committee on Resuscitation³ suggests that children should be taught basic theoretical concepts of OHCA response beginning from the preschool age (four years old and above).

Apparently, world-wide implementation of CPR education for children of various ages necessitates tremendous organizational efforts. One of the major tasks involves development of age-appropriate training curriculum and educational materials that should be adopted to cultural, social, and economic contexts of specific countries. This challenge is associated with expenditure of time and money, and therefore may constitute a barrier for wide-spread introduction of CPR education for children, especially in resource-limited settings.⁴

Today, artificial intelligence (AI) chatbots powered with Generative Pre-Trained Transformer (GPT) models garner great public and researcher attention. Being trained on a large dataset of text in multiple languages, these models can produce highly sophisticated human-like responses based on a context of input text.⁵ Free GPT chatbots, including ChatGPT (OpenAI; San Francisco, California USA) and the new Bing (Microsoft Corporation; Redmond, Washington USA), became extremely popular due to their impressive capabilities for solving a range of language-based tasks, including question answering, machine translation, and text generation.⁵ From the resuscitation education perspective, it seems important and timely to explore the potential of using the AI-chatbots for developing educational materials on CPR.

In May 2023, the new Bing chatbot was queried: “Propose 10 types of educational materials to teach children on CPR that Bing chatbot can create.” The chatbot responded with a list of educational materials ranging from a song explaining the steps of CPR to a programming code generating random CPR scenarios and challenges to solve (Table 1). When asked to create certain materials, it showed an impressive ability to comprehend a query and generate age-appropriate textual content summarizing key points of resuscitation. This suggests rather promising opportunities to use the chatbot for composing valuable educational resources, along with anticipated time and cost savings that could expedite implementation of CPR education for children.

However, it is important to bear in mind that the GPT-based chatbots are a kind of “black box technology” that can give plausible-sounding but incorrect responses.⁵ Therefore, the AI-generated content should always be meticulously reviewed and verified by a human expert before its intended use. Further research is required to determine the best practices for using the cutting-edge GPT-powered chatbots in a safe and responsible way with the aim of promoting resuscitation education across the world.

User's Query	Chatbot-Generated Content
Propose 10 types of educational materials to teach children on CPR that Bing chatbot can create.	That's an interesting request. Here are some possible types of educational materials to teach children on CPR that I can create: <ul style="list-style-type: none"> - A short story about a hero who saves someone's life by performing CPR. - A catchy song with lyrics that explain the steps of CPR. - A comic strip that illustrates how to do CPR in different scenarios. - A crossword puzzle that tests the knowledge of CPR terms and concepts. - A poster that summarizes the main points of CPR with colorful images and slogans. - A quiz that checks the understanding of CPR and gives feedback. - A video that demonstrates how to do CPR on a dummy or a person. - A game that simulates a real-life situation where CPR is needed and rewards correct actions. - A poem that rhymes and describes the benefits of CPR. - A code that generates random CPR scenarios and challenges the user to solve them.
Create a rhyme for 4-year-old kids no longer than two quatrains that uses mnemonics to teach the emergency telephone number.	If you're in trouble and need some help, Don't be scared and don't you yelp. Just remember this simple rhyme, And dial the number in good time. Nine-one-one is what you need. Say it loud and say it clear. Tell them who you are and where, They will come and take good care.
Create a song for 8-year-old kids no longer than four quatrains that describes how to do chest compression-only CPR (no rescue breathing). The song should follow a beat of 100-120 per minute.	If someone falls down and they don't make a sound, Don't panic, don't cry, just follow these steps. First, call 9-1-1 or ask someone else, Then check if they're breathing by looking at their chest. If they're not breathing, then you have to act fast. Put your hands on their chest, one on top of the other, Press down hard and fast, about two inches deep. Keep the rhythm steady, like this beat. One and two and three and four. Five and six and seven and more. Keep on going until help arrives. You're doing great, you're saving lives! Don't stop pressing, don't give up. You're a hero, you're so tough. One and two and three and four. Five and six and seven and more.
Create a short story for 12-year-old children about a hero who saves someone's life by performing CPR. Consider a lay rescuer (no pulse check, no rescue breathing). Address the technique of chest compressions (rate, depth, chest recoil, and minimal interruptions) and the need to overcome a fear of causing harm to a victim. Limit to one paragraph of text.	When Jake saw his friend Ben collapse on the soccer field, he knew something was wrong. He ran over to him and saw that he was not breathing. He remembered what his teacher had told him about CPR: it could save someone's life by keeping their blood flowing until help arrived. He also remembered that he had to push hard and fast on Ben's chest, about two times per second, and let the chest come back up after each push. He was afraid of hurting Ben, but he knew that doing nothing was worse. He shouted for someone to call 9-1-1 and started to do chest compressions. He counted out loud to keep the rhythm: "One, two, three, four..." He did not stop until the paramedics came and took over. They told him that he had done a great job and that Ben would be okay. Jake felt relieved and proud. He had saved his friend's life by doing CPR.

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Table 1. Examples of Application of the Artificial Intelligence-Based Chatbot for Generating Educational Materials on CPR
Note: The new Bing chatbot generates its responses using a text-based interface and does not generate non-textual content like videos. Instead, it creates detailed text description of how to design the non-textual content (eg, video script).

Abbreviation: CPR, cardiopulmonary resuscitation.

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