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Can Artificial Intelligence, specifically Large Language Models (LLMs), enhance human emotional intelligence responses in a small team work environment?

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Recommended Citation

AVIT430: Crew Resource Management

Can Artificial Intelligence, specifically Large Language Models (LLMs), enhance human emotional intelligence responses in a small team work environment?

Due date(s): Pre-determined in-class period following the formal Emotional Intelligence/Human Relations in-class lecture

Purpose: This assignment will allow students, working in small groups of 3-5, to explore a LLM's (ex: ChatGPT) response to typical human interactions they may face while operating in an aircrew environment. Several articles have suggested that LLMs may actually be more successful at modeling proper human emotional responses than factual based responses. The objective of this assignment is for students to discover if and how a LLM can serve as a model for proper crew responses to minimize conflict and increase team effectiveness. This may have future impact on enhanced aircraft automation and can also serve as a useful tool to examine one's response to a given situation past, present, or future. Clearly, a pilot is not going to use a LLM to generate a response to a situation in flight, but this tool may be useful in examining "what if" scenarios and also reflecting on how a pilot could have handled a situation differently. This exercise and group discussion builds upon the AVIT430 Human Relations/Emotional Intelligence lesson.

Skills:

The purpose of this assignment is to help the student practice the following skills that are essential to the student's success in Crew Resource Management as an aviation professional. These skills are also beneficial in many areas of life in general:

- Contrast the LLMs response to a given potential crew conflict situation to that of the group members' response.
- Distinguish differences between LLM responses and group generated responses and examine them for possible bias or misunderstanding.
- Experiment by adjusting the LLM inputs to achieve different (and possibly better/more accurate) results.
- Compare LLMs response to a given situation the student has personally experienced to the student's real-world response and experience.
- Evaluate the potential for LLMs to assist in effective Crew Resource Management training and for their potential to serve as or assist as an additional crew member.

Knowledge:

This assignment will also help the student to become familiar with the following important content knowledge in this discipline:

- Realize the importance of developing human relations skills.
- Understand the importance of Emotional Intelligence to enhance successful leader and follower actions.
- Comprehend the role Emotional Intelligence plays in Crew Resource Management
- Apply some strategies for dealing with different types of people, including difficult situations.

Tasks (timing based on 50 minute class session):

Form small discussion groups (3-5 students) at the instructor's direction.

Step 1: **Individual Response** (~10 mins): Review the assigned situation for each group (from attachment page). Each group will read the scenario and each group member will individually write an effective response to the situation. Then the group will discuss the written responses.

Step 2 Analyze LLM Response (~10 mins): Each group will enter the situation in the LLM and direct it to generate a response to the situation. The group will compare and contrast differences from the group members' answer from the LLMs answer. Group members may modify the prompt to refine the LLMs answer.

Possible Questions to Consider

- Did the LLM demonstrate adequate Emotional Intelligence in the situation?
- Was refinement required to generate a more accurate response?
- Were there considerations that the human response used but the LLM missed or vice versa?
- Could this tool be useful as an Emotional Intelligence awareness trainer?
- Could this tool serve as an effective crew member?
- Could this tool help reduce conflict amongst crewmembers?

Step 3 Class Discussion (~15 mins): Groups will briefly discuss the results of their example situation with the class.   Focus on the biggest takeaway your group determined from the exercise in Step 2. Use the questions in Step 2 to assist as applicable.

Step 4 Reflect on Past CRM Situations (~15 mins): Students individually complete the same task from Step 1 but this time they use their personal situation example. If they can't think of a past situation, they can use one from a famous aircraft incident or create one they may anticipate experiencing. They should compare and contrast the response from the LLM to the situation as they experienced it. Students will discuss within their small group the lessons they learned from the LLM response and how they can incorporate those lessons in the future to enhance their Emotional Intelligence and Crew Resource Management.

Criteria for Success: Students should be engaged and working together to explore the usefulness of LLMs to model proper human Emotionally Intelligent responses to potential conflict situations. A successful outcome should include robust discussion, a thorough analysis of the LLM response versus the student response, and an evaluation of how these tools may be useful for future training and real-time operations to enhance Crew Resource Management.

Attachment 1: Example situations (Each group review the scenario assigned)

Scenario 1

Your Role: Captain

Situation: You've had a difficult trip with many weather and maintenance delays. The first officer is constantly second guessing your decision making and it's beginning to annoy you. You want to address the situation before you snap. How can you re-assert your authority while maintaining civility on the flight deck?

Scenario 2

Your Role: First Officer

Situation: The captain is flying the approach and becomes unstable on short final. You call "Go Around" but the Captain states, "No, I've got it" and saves the landing although it is not pretty. As you clear the runway and taxi to the terminal you are very angry and want to address this breach of safety situation as soon as the engines are shut down. How will you address the captain's actions?

Scenario 3

Your Role: First Officer

Situation: The captain is obviously not having a great day. Each delay is causing him to become more and more irritated. The latest instance was a minor maintenance issue during which he berated the maintainer for not fixing the issue in a timely manner. How will you address the captain and can you do anything to smooth over the relationship with the maintenance professionals and/or other crew members?

Scenario 4

Your Role: Captain

Situation: You're flying with a newer First Officer who is not having a good day. The FO is missing routine checklist items during the preflight and you've had to correct several mistakes. You're frustrated and to blow off steam you make the following comment to the lead flight attendant just before closing the door for departure: "Someone up here's got a case of the Monday's, looks like I'll be flying this thing solo today!" Although you meant this as a joke, you can tell the FO is now very angry as you taxi out and depart. When you reach cruise, you need to fix this situation, but how?

Scenario 5

Your Role: First Officer

Situation: You're a new FO completing your line training flights with a very experienced Captain. The Captain, although extremely knowledgeable, has a tendency to micromanage your flying and provide advice during critical phases of flight. This has caused you to get behind a couple of times and you've become frustrated. How do you let the Captain know you appreciate the training and advice, but the volume is overwhelming and the timing is inappropriate?

Scenario 6

Your Role: First Officer

Situation: You're flying with a crew that you have never flown with before. After the walk around, the lead flight attendant approaches you and tells you that he's flown with the Captain before and that you better be on your "A Game". He starts telling you about things he's seen and heard that discredit the Captain's authority and ability. How might you respond in this situation?

Scenario 7

Your Role: Captain

Situation: You're holding short for departure at a busy airport; you are number 10 in line so you know it's going to take some time before you depart. The FO starts complaining about the company scheduling practices and labor disputes. He's using colorful language while insulting the airline's leadership. You know everything is being recorded on the Cockpit Voice Recorder and that if you're going to have an incident that it will be more likely to occur during departure. You can't imagine going through a safety investigation with the transcript of the FO's pre-departure angry rant being presented for all to hear. How will you address this situation?