An education QIP, "Bug Bytes": Using Artificial Intelligence (AI) generated graphics as a medium for medical education, specifically in the context of Infectious Diseases and Antimicrobial Stewardship Dr Robert James Shannon [1], Dr Karen Fitzmaurice[1][2], Dr Arthur Jackson [1]

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INTRODUCTION

Medical education can be delivered in a variety of modalities. Traditionally, this has involved didactic lectures, bedside or small group tutorials and reviewing textbooks or medical literature. In the digital age we have come to realise that both students and clinicians are now availing of non-traditional ways to acquire medical knowledge – e.g. accessing podcasts, YouTube or blogsites. Images, in particular, have also shown to quickly convey information and act as a learning scaffold for any associated text (1).

RESULTS

Consistency in character appearance required detailed instructions for physical and emotional features of each character. Almost always, to generate an acceptable picture, multiple AI-offered drawings are rejected, with text description refinements and general re-direction required.

Once pictures were acceptable, they were saved and collated into a PowerPoint framework, with text inserted using PowerPoint SmartArt (e.g. speech bubbles). Various

CONCLUSION

We demonstrated that with modern AI technology, it is possible to develop novel, yet effective ways of imparting medical knowledge, in this case using comics / graphic novels as a medium for Infectious Disease or Antimicrobial Stewardship themed scenarios.

As educators, it makes sense to try to move with this flow and evolve the way we impart our knowledge. The graphic novel has become a more mainstream form of literature in recent years in both fiction and non-fiction. It can also be used in medical education, demonstrating research findings, or easily communicating knowledge to medical communities or even nonmedical practitioners.

Artificial Intelligence (AI) has recently come to the fore of society via several publicly accessible tools – i.e. ChatGPT, Socratic etc; and can now be used to generate images without the need of an illustrator. excerpts are demonstrated below.



While seemingly simplistic on the surface, we also show that familiarity with the toolkit and defined editorial standards are required to maintain consistency and quality with the products. Future qualitative analysis will allow us to assess the effectiveness of this venture in medical education.

ETHICAL CONSIDERATIONS

Patient consent and confidentiality: Cases are "inspired by real events" but character attributes, results, and exact scenarios have been significantly altered. There is always the risk when presenting a rare disease that a patient could feel they can identify themselves, but we feel we have taken enough steps to allow us to proceed without requiring patient consent and to date we have not submitted any outputs for formal publication. That said, we do understand that there may be some ethical questions surrounding the process of anonymising/decoupling identifying features and the degree of same.

OBJECTIVES

Our goal was to use commercially available AI technology to develop educational "comics" that demonstrate a variety of medical case scenarios. These are applicable to all levels of Medicine, from Student to Specialist. A constant in creating these was also the need to maintain humour, fun and narratively engaging stories to further enable recall.

> MATERIALS and METHODS

Cases and scenarios were considered "offline". Often scenes were inspired by recent clinical presentations or encounters in the workplace.



Fig 1: The Adventures of Meropen-man, Episode Klebsiella



Use of AI:

The use of AI generated images can be controversial and not only is there a sense of IP infringement, it can be seen as keeping illustrators out of work. We would comment that this style of education in our institution would not be possible without using AI due to lack of funding for illustrators, and AI further facilitates this process by allowing the educators to work independently and in their own time.

The need for cloud computing and massive data analysis contributes a large carbon footprint, but seemingly a lower one that supporting digital illustrators (2). Future AI options may involve less energy usage, and some research points toward local computers being capable of "Private Local AI" without using remote servers

ChatGPT4 Pro in combination with DALL-E word-to-image software was used to draw individual panes from text descriptions, with the outputs being various themed "comic strips".

Weekly editorial meetings involving all contributors assisted with educational content and thematic direction.

REFERENCES

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