EURASIAN EXPERIMENT JOURNAL OF SCIENTIFIC AND APPLIED RESEARCH
(EEJSAR) ISSN: 2992-4146
©EEJSAR Publications Volume 5 Issue 3 2024

The Role of Digital Art in Science Communication

Kabiga Chelule Kwemoi

Faculty of Engineering Kampala International University Uganda

ABSTRACT

Digital art is emerging as an important technique for disseminating scientific knowledge, providing visually appealing and understandable renderings of complicated ideas. This paper investigates the relationship between digital art and science communication, focusing on how digital art simplifies complex scientific concepts for a variety of audiences, including non-specialists. The advancement of digital technologies has allowed for more creative and dynamic science communication tactics, notably in visual storytelling. This study also looks at the advantages, constraints, and best practices for incorporating digital art into science communication efforts. By exhibiting successful projects and addressing the boundaries of this confluence, we hope to emphasize digital art's role in increasing public engagement with science, boosting interest among younger generations, and improving science literacy in society.

Keywords: Digital art, Science communication, Visual storytelling, Public engagement, Scientific visualization.

INTRODUCTION

Science communication and public engagement have both evolved as crucial aspects in every domain. This has opened multiple platforms for educators, researchers, and lay audiences to have dialogues with one another and digital spaces like social media are used extensively to propagate scientific ideas. Enabling the flow of scientific information to diverse audiences is essential, and one of the most powerful ways to achieve this is through art. With increasing digitalization and the rapid advancement of digital technologies, traditional art has also gone through a range of modifications. This has been salient in science communication, since digital art can often simplify scientific facts and give them a creative twist [1, 2, 3]. In science communication, especially with a non-specialist audience, a fundamental goal is to simplify the complexity of a subject while also ensuring that the essence of it is not compromised. Apart from simplification, it also accelerates the process of synthesizing scientific concepts. Another strong tool in science communication is the use of visualization to disseminate information rapidly to an audience, and it has been proved that combining text with visuals increases the probability of memorizing complex information. Reaching out to diverse audiences means that science communication should also serve the purpose of creating science enthusiasts, future scientists, science communicators, or policymakers. In this ever-changing digital age, traditional art provides a foundation for new and novel modes of science communication. Art and science not only intersect but often overlap. This idea of image and science becomes increasingly more plausible when we consider that the major mode of engagement between art and science has occurred in the realm of visual elements [4, 5, 6].

The Benefits of Using Digital Art in Science Communication

There are many ways to create and use scientific visualizations. One of the commonly used methods is to create simple and attractive illustrative images, which is also known as digital art. Digital art has been around in many formats for a long time, long before scientific visualization started to gain momentum and attention within many scientific fields. The use of digital art to represent complex concepts and visualize data has been extremely useful in the general field of science communication. For digital art to successfully communicate complex scientific concepts, it needs to tell a cohesive story, capture the

imagination, capture the truth and insights within the data or concept, adhere to common brain processing, and respect the current vision of how that concept works. However, despite the increased use of more rigorous definitions for scientific visualization, digital art still needs to be included within the realm of scientific visualization as it presents useful and easy-to-understand snapshots of complex concepts in limited space with minimum effort [7, 8, 9].

Examples Of Successful Digital Art Projects in Science Communication

Science seeks to explain the world around us, and how society exists in that world. However, science is often esoteric, and esotericism is not a tool for communication. It is therefore impossible to separate science from society, and that means that science communication needs to be a two-way process—society must be able to inform science. Digital art is very good at this sort of inclusive dialogue. A third of art museums' audiences are aged between 15 and 25—society's next crop of adult decision-makers and influencers. A survey indicated that art has a similar-sized and diverse audience to museums and that artists are seen as key shapers of young people's interest in 'science.' Indeed, decades of research have shown that while science capital (awareness, knowledge, cultural resources, and contacts) is not a precondition for interest in science, interest in science improves if you have science capital as a teenager [10, 11, 12]. This presentation will consider the role of digitally produced visual art as a pertinent partner in the dialogue between science and society and science communication, with examples from an 'unusual and successful' science communication collaboration between school students and a scientist over manually manipulated antimicrobial resistance. Anomalous Antibiotics was a six-week research residency aimed at students aged 11 to 14 years based at the Helmholtz Institute for Pharmaceutical Research. The objectives of the project were to educate, stimulate interest in science, and give students an insight into the life of a scientist with direct hands-on experience—without an adult interpretation as to what this both is and means. Along the way, interesting microbiological statements were also generated [13, 14, 15].

Challenges and Limitations of Digital Art in Science Communication

Digitization has a major impact on how information is nowadays transferred to the general public. Because art often surprises, amazes and conveys the emotions of its creator, digital art has obvious potential in science communication. The symbolic and illustrative role of digital art in conveying scientific insight is widely valued. A dialogue between scientific information and a variety of art forms offers wide possibilities to inform and inspire in an easily accessible manner. Digital art has an aspect related to our contemporary times: it uses electronic tools that can deal with gigabytes of information and may engage not only the visual sense, as works can be interactive or able to change according to input from the spectator. Moreover, digital art's reproduction doesn't produce degradation of the original artwork, contrary to the reproduction of traditional art [16, 17, 18]. The aforementioned advantages of setting up a dialogue between artists and scientists through digital art are balanced by some limitations and potential problems: First of all, when setting up a scientific project, it has to be made clear that the impressive originality of digital visualizations of scientific data should never correspond to a distortion of reality. Only a correct representation, and therefore a scientifically controlled one, ensures the informational and educational potential of digital scientific art. The artistic side of realistic art is, then, subordinate to the scientific result. This means that a scientific concern, constraint, or idea will be transformed into a convincing, appealing, and persuasive image according to the artist's creativity [19, 20, 21].

Best Practices for Integrating Digital Art into Science Communication Efforts

Digital art is a powerful tool in science communication. It is flexible and spans a wide range of media that can be easily shared and understood. While it is a useful tool, not all art that engages with scientific topics is successful at communicating science. We present five best practices to engage the public with scientific topics more effectively through digital art. These practices are shown as five guidelines that researchers, practitioners, and students in both fields are encouraged to adopt. The question of how digital art can be brought into science communication is a developing area where scientific professionals and artists are currently relying on established methodologies. Our recommendations are drawn from a combination of presented strategies, experience, and the comparison to existing guidelines within other similar subfields of art-science practice. This comparison also provides support for our guidelines [22, 23, 24]. Selected digital art is illustrative, and imaginative, and extends the wonder of the natural world further. We feel that the use of effective, well-integrated digital art excites everyone about current and new scientific discoveries as well as the work of scientists within their communities. While the creation of scientific digital art, along with best practices for its development, is also in its early years, digital artistic

engagement is an important aspect of developing new integrated science communication efforts. We feel that, in the future, digital art may encourage students and the public to utilize science in future endeavors. It is also used in educating and fostering value in certain other fields. With digital art, we strive together to educate about pressing issues that we are currently facing [25, 26, 27].

CONCLUSION

Digital art offers a powerful medium for science communication by providing visually appealing and easily digestible representations of complex scientific information. Its ability to engage diverse audiences, including those with limited scientific knowledge, makes it a valuable tool for educators, researchers, and communicators. However, while digital art can effectively convey scientific concepts, it is essential to balance artistic creativity with scientific accuracy to avoid misrepresentation. As digital tools continue to evolve, so will the methods for integrating digital art into science communication, offering promising pathways for improving public understanding and fostering a deeper appreciation for science. The future of science communication lies in embracing these innovative approaches to make science more inclusive, accessible, and inspiring for all.

REFERENCES

1. Accoto C. The Golden Age of (Computational) Simulation. Lexicon Philosophicum: International Journal for the History of Texts and Ideas. 2024 Aug 7(11):7-17.
2. Kondo D. Power and Theory: Structural Racism and Zones of Sanctioned Ignorance. Theatre Journal. 2023;75(4):519-32.
3. Paesano A. Artificial intelligence and creative activities inside organizational behavior. International Journal of Organizational Analysis. 2023 Oct 31;31(5):1694-723.
4. de Koning BB, Rop G, Paas F. Learning from split-attention materials: Effects of teaching physical and mental learning strategies. Contemporary Educational Psychology. 2020 Apr 1;61:101873.
5. Scharinger C, Schüler A, Gerjets P. Using eye-tracking and EEG to study the mental processing demands during learning of text-picture combinations. International Journal of Psychophysiology. 2020 Dec 1;158:201-14. sciencedirect.com
6. Bakaev M, Razumnikova O. What makes a UI simple? Difficulty and complexity in tasks engaging visual-spatial working memory. Future Internet. 2021 Jan 19;13(1):21.
7. Crameri F, Shephard GE, Heron PJ. The misuse of colour in science communication. Nature communications. 2020 Oct 28;11(1):5444.
8. Kraus S, Jones P, Kailer N, Weinmann A, Chaparro-Banegas N, Roig-Tierno N. Digital transformation: An overview of the current state of the art of research. Sage Open. 2021 Sep;11(3):21582440211047576. sagepub.com
9. Bianchini S, Müller M, Pelletier P. Artificial intelligence in science: An emerging general method of invention. Research Policy. 2022 Dec 1;51(10):104604.
10. Miklošević Ž. Fostering inclusion in art museums through mobile digital content. Muzeológia a kultúrne dedičstvo. 2021;9(4):5-19.
11. Jagannathan K, Emmanuel G, Arnott J, Mach KJ, Bamzai-Dodson A, Goodrich K, Meyer R, Neff M, Sjostrom KD, Timm KM, Turnhout E. A research agenda for the science of actionable knowledge: Drawing from a review of the most misguided to the most enlightened claims in the science-policy interface literature. Environmental science & policy. 2023 Jun 1;144:174-86.
12. Judd K, McKinnon M. A systematic map of inclusion, equity and diversity in science communication research: Do we practice what we preach?. Frontiers in Communication. 2021 Oct 11;6:744365.
13. Brey A. Digital art history in 2021. History compass. 2021 Aug;19(8):e12678.
14. Pruulmann-Vengerfeldt P. Datafying museum visitors: A research agenda. Information & Culture. 2022 Mar;57(1):63-81.
15. Mutibwa DH, Hess A, Jackson T. Strokes of serendipity: Community co-curation and engagement with digital heritage. Convergence. 2020 Feb;26(1):157-77.
16. Hartley J, Ibrus I, Ojamaa M. On the digital semiosphere: Culture, media and science for the Anthropocene. Bloomsbury Publishing USA; 2020 Dec 24.
17. Denning PJ, Tedre M. Computational thinking: A disciplinary perspective. Informatics in Education. 2021 Jul 1;20(3):361.

18. Noehrer L, Gilmore A, Jay C, Yehudi Y. The impact of COVID-19 on digital data practices in museums and art galleries in the UK and the US. Humanities and Social Sciences Communications. 2021 Dec;8(1).
19. Cieri RL, Turner ML, Carney RM, Falkingham PL, Kirk AM, Wang T, Jensen B, Novotny J, Tveite J, Gatesy SM, Laidlaw DH. Virtual and augmented reality: New tools for visualizing, analyzing, and communicating complex morphology. Journal of morphology. 2021 Dec;282(12):1785-800. ljmu.ac.uk
20. Hassan R. Digitality, virtual reality and the 'empathy machine'. Digital journalism. 2020 Feb 7;8(2):195-212.
21. Lan X, Liu Y. "I Came Across a Junk": Understanding Design Flaws of Data Visualization from the Public's Perspective. IEEE Transactions on Visualization and Computer Graphics. 2024 Sep 10.
22. Franconeri SL, Padilla LM, Shah P, Zacks JM, Hullman J. The science of visual data communication: What works. Psychological Science in the public interest. 2021 Dec;22(3):110-61. sagepub.com
23. Bentz J. Learning about climate change in, with and through art. Climatic Change. 2020 Oct;162(3):1595-612.
24. Meyer ET, Schroeder R. Knowledge machines: Digital transformations of the sciences and humanities. Mit Press; 2023 May 9.
25. Clark RC, Mayer RE. E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning. john Wiley & sons; 2023 Dec 12.
26. Kolyvas S. Innovative and Collaborative Learning in Visual Arts with the Use of Modern Educational Software. Education Quarterly Reviews. 2020 May 28;3(2).
27. Haleem A, Javaid M, Qadri MA, Suman R. Understanding the role of digital technologies in education: A review. Sustainable operations and computers. 2022 Jan 1;3:275-85. sciencedirect.com

CITE AS: Kabiga Chelule Kwemoi. (2024). The Role of Digital Art in Science Communication. EURASIAN EXPERIMENT JOURNAL OF SCIENTIFIC AND APPLIED RESEARCH, 5(3):19-22.