



Tailoring Science News Reporting for Audience Engagement: Effective Writing Strategies

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Abstract— Science news reporting plays a critical role in fostering public understanding of complex scientific concepts. But it often struggles to engage diverse audiences. This paper explores effective writing strategies that enhance audience engagement in science journalism. It identifies key elements that make science reporting more accessible and appealing. Writing strategies such as simplifying jargon, using narrative techniques, incorporating human interest stories, and connecting scientific developments to real-world applications are highlighted. Additionally, the use of visuals, analogies, and interactive digital elements is discussed for their role in enhancing comprehension and retaining reader interest. By offering insights into successful writing approaches, this paper aims to contribute to the ongoing efforts to make science news more inclusive and relevant to a broader audience, particularly in an era of information overload and scientific scepticism.



Keywords— Science News, Narrative Techniques, Appeal, Audience Engagement

I. INTRODUCTION

The relation between science and society is of tremendous importance to humankind. Science acts as a key driving force for socio-economic success. Therefore, establishing a solid relationship between science and society is of paramount importance. Science communication strives to bridge the gap between the two by making sure science-based information is spread far and wide. It has been defined by Burns et al. (2003) as “the use of appropriate skills, media, activities, and dialogue to produce one or more personal responses to science”. Further, they said that such responses are based on the AEIOU analogy. They are Awareness, Enjoyment, Interest, Opinion Formation and Understanding. According to Fischhoff and Scheufele (2011), the interrelated tasks that science communication must perform are:

-Identify the science most relevant to the decisions that people face.

-Determine what people already know.

-Design communications to fill the critical gaps (between what people know and need to know).

-Evaluate the adequacy of those communications.

From the COVID 19 Pandemic, to Climate Change, subjects of scientific importance have a direct impact on the wellbeing of the public. The importance of social distancing to prevent the spreading of Coronavirus and the role of human activities in causing climate change is not lost on the population witnessing the horrors of the pandemic or that of the deteriorating climatic conditions. The significance, therefore, of timely and effective awareness is pivotal to ensure the wellbeing of the masses. Any understanding of these subjects by the masses could be credited to science reporting. Be it breaking down complicated scientific studies for the benefit of the public, simplifying jargon, or effectively communicating why one should care about something and how, science reporting has a huge role to play in the scheme of things. However, with great powers

come great responsibilities. The trust of the masses that are not likely to be invested in scientific developments, relies almost entirely on the effectiveness and accuracy of the communication. However, when factors like misinformation, sensationalisation interfere with the practice of science reporting, the stakes are high and the damages are difficult to manage. Hence, science reporting single-handedly gets the responsibility for spreading awareness, combating disinformation, aiding informed decision making, enhancing scientific literacy among the masses, thus bestowing it a critically important position in journalistic reporting.

Neil deGrasse Tyson, an astrophysicist and science communicator who shot to fame with “Cosmos: A Spacetime Odyssey (2014)” dissects the practice of science communication and its evolution through ages for “Big Think” in “Science journalism has a problem” on YouTube platform. While talking about the importance of effective science reporting based on his past experience, he remarks how the lack of fundamental awareness among the science reporters have made the public question science and scientists. It is well known that the value of balance in journalistic writing is considered important and hence preaches shedding light on both supporting and opposing opinions as well as a 360-degree coverage. However, Tyson points out that the practice of putting opposing views in science and scientists for the journalistic value of balance is highly flawed and unsought for. Putting forth the example of climate change, Tyson states that the studies that support the occurrence of climate change are far more in number as well as in evidence than that of the scientific studies that oppose it. Therefore, giving the same prominence in space to opposing views in science could be hugely misleading and unreliable. This sets the specialisation of science reporting apart from other disciplines in journalistic reporting. And, while the science journalists have the responsibility to understand how to present science reports, the responsibility of verifying and deciding what to report also lies in their purview of their specialised work.

An instance of misinformation downplaying the discipline of science reporting was brought to the forefront by Science Journalist, John Bohannon in 2015. Bohannon ran a randomised real study that was flawed intentionally to show how easy it was to turn scientifically unsound studies into headlines. The study was on the consumption of chocolate and its impact on weight loss. And although Bohannon admitted the study to be fake, to his dismay, this study was picked up by news outlets like Huffington Post and Daily Express. According to Bohannon, the journalists picked the story and mostly without ever contacting him regarding the study. The instance proved just how easily something that seemed to be backed by science found a place in the

headlines of prominent publications. This stated the importance of verifying the credibility of the studies, the researcher, the institution to fund the research, the publisher, so on and so forth to ensure that there is no vested interest in the research. Additionally, the study by Bohannon also looks into flawed science reporting is, to a huge extent, click-bait reporting with very little to do with the facts and the thumbnails or title descriptions.

Distinguishing sound science reporting from questionable science reporting requires a strong basis of scientific literacy among the citizens. Something else that requires a reliable scientific temper and literacy among the citizens is the translation of scientific findings to information that could be actionable for the masses. During the COVID 19 pandemic, for instance, the science reports sought the help of public health experts and virologists to explain the impact of vaccination. Effective communication in the context has the potential of spreading awareness, driving impact, and fighting panic and paranoia leading to vaccine scepticism. Clear intent behind the reports could help foster public trust immensely and lead efficiency in aiding decision making and bringing behaviour change.

1.2. Importance of Effective Writing Strategies in Science Reporting

When it comes to effective science reporting, though the practice has been thriving since decades, the process of communication has evolved significantly and rapidly. Gone are the days where illustrations were for the sake of aesthetics and poor-quality graphics did the job to compliment a story. In the age of digitization, it has become increasingly important to enhance the visual storytelling accompanying a science story. New Zealand’s Stuff for instance, works on the visual storytelling in its science reports with interactive graphs, stunning visuals, illustrations to effectively drive the impact of a story. Further, visual stories require something more still to make the story engage with its audience. The process of discovering a phenomenon, the process of capturing a science story also helps a story go beyond the report into minute details of a story. The prominence of visual storytelling, therefore, reaffirms the need to enhance the engagement while reporting for science.

Science reports, like any other area of journalistic writing, requires context setting and simplification of an occurrence to convey its relevance. And given that the stories have a significance in the day-to-day lives of the masses, clarity and simplicity in the reports is critical to communicate scientific findings and happenings. Apart from simplification, the public also relies on science reporters to make sense of events and their impact on the public by interpreting concepts.

In science news writing, use of analogy acts as a vital tool to bridge the gap between complex scientific concepts and the general public. By comparing unfamiliar ideas to everyday experiences, they make the abstract or technical information relatable and easier to understand. For example, by describing a black hole as a cosmic vacuum cleaner, helps the non-experts grasp the concept of gravitational pull of a black hole. This enhances engagement as it allows readers to form mental models of phenomenon that they cannot see or experience. This technique simplifies the intricate details, provides context and clarity while maintaining the integrity of the information. Science communicators by using analogy can captivate their audience and foster a deeper appreciation for science.

Similarly, human interest stories are invaluable in science news reporting as they make complex topics more relatable by focussing on real-life experiences. They create an emotional connection with the audience where the narrative motivates action and generates empathy. By humanising research, it shows the real-world impact of scientific developments on individuals or communities. For instance, a story that features the transformation of the life of a farmer by adopting precision farming techniques to conserve water and increase crop yields puts a human face on science.

Lastly, along with attracting the audience's attention, engaging them with a report, the task of a science report is to concisely put forth an occurrence with its impact on the society at large while also keeping the science intact. Therefore, it becomes of importance to distill science reports, understand underlying message and fundamentals of science findings, and convey them in digestible pieces. Only thorough reports could do with producing crisp concise pieces for non-science readers.

Hence, all these considerations together build the base for effective science reporting that is capable of presenting scientific developments while making sense of it in the larger context relevant to the society.

II. LITERATURE REVIEW

Bernal, J.D. (1939) served to draw the connection between the scientific studies of the day and age in the context of its society and science's contribution towards a society. The work explores the subject in two parts. While one part of the book deals with the then scenario of science and its contributions while the other looked into the potentials of science towards a more organised future. The book looks into the impact of science while studying the interconnectivity between science and industry. Further, the emphasised the need for the scientists to collaborate with the policy makers so as to achieve greater benefits. Bernal's work is considered to be an important work among the early

interdisciplinary studies of science, sociology, philosophy, history, etc.

Daniel S. Greenberg (1967) in his book, "The Politics of Pure Science" critically studies the research policy of the U.S. after World War II. He puts forth the process in politics that plays a part in the funding of science by the government and states that the politics in the field is like that of any other. His work remains an important study about the relationship between government, science, and society.

Hansen, A. (1994)'s study on "Journalistic Practices and Science Reporting in the British Press" intended to delve into the journalists and their characteristics while specialising in medicine, science, and topics related to science and the practice of journalism for the British National Press. The study looks into the practice of a professional such as the process of news gathering, verification, presentation with emphasis on factors like credibility and accuracy. The study also looks into the challenges in science reporting, the understanding of science reporting and journalism by the public, and the ethical issues and consideration in the field.

While, Boykoff, M. T., & Boykoff, J. M. (2004) in their work "Balance as Bias: Global Warming and the US Prestige Press" looked into how the US Prestige Press and their adherence to the norms of balanced reporting led to bias in the coverage of global warming and climate change, Boykoff, M. T., & Boykoff, J. M. (2007) in the study, "Climate Change and Journalistic Norms: A Case-Study of US Mass-Media Coverage" explored the impact of journalistic practices in science communication on the audience perception. The study emphasised on how the journalistic coverage was often found to be insufficient and caused miscommunication which in turn affected effective communication between the science community and the public.

Brufiel, G. (2009)'s article looks into the steady decline in traditional practices of science journalism and the bloom in science blogs instead. The study explores how there has been an increase in democratisation in the information owing to the internet paving way for diverse voices contributing to the practice of science communication. However, he also points out concerning trends in the reliability of such information in the lack of professional sources.

Nisbet MC, Scheufele's study "What's next for science communication? Promising directions and lingering distractions" focuses on the engagement of the public with science and technology by the help of communication. Important considerations like the importance of crafting science communication in a way befitting the audience's beliefs and their values were emphasised through the study.

A closer study into the varying communication strategies that could propel the public to engage with science related issues helped understand the engagement levels. Moreover, media influence, and implications of science communication in the process of making policies was also explored by the study.

Allgaier, J. (2019) in his study “Science and Environmental Communication on YouTube: Strategically Distorted Communications in Online Videos on Climate Change and Climate Engineering,” studies the information on climate engineering and climate change available on the Youtube platform to analyse if their stand supports or opposes the scientific consensus on the subject. The study finds that the majority of the videos oppose the scientific consensus while promoting conspiracy theories on the subject. Additionally, the view count on the videos that support the scientific consensus match that of the opposing stand’s view count suggesting equal public exposure to both the types of videos. This highlights the need for analysing the content critically while understanding the challenges in the medium.

Schafer and Fahrick, B.’s study “Communicating science in organisational contexts: toward an “organisational turn” in science communication research” looks into understanding the communication of science to the public by reviewing communication science’s empirical evidence. The areas that their study explores are the structure of research in the field, the role of the communicators who belong to the field, the portrayal of science through digital media, news media, and online platforms, and the effect and use of science communication for the public.

Dunwoody, S. (2021) in her Chapter, “Science journalism: Prospects in the digital age” looks into the evolution for science journalism and studies the challenges that exist for traditional media at the face of rise in digitization of the platforms. Her suggestion towards the practice is to adapt to the developments in new media to enhance the control on the dissemination of information. Sharon also emphasises on the need of enhancing the production of high-quality journalism to combat misinformation and issues.

III. MECHANICS OF WRITING

Information is the crux of all communication but when it comes to science communication, the criticality and sensitivity of the information relies heavily on the means of communicating for the successful relaying of the messages. It is important for science reporting to have skilled presentation attuned to the science community and the public needs to foster informed decision making, enhancing public trust and engagement with science. This brings forth the need for established norms and especially norms that do

not limit science communication forcing inaccurate delivery of the information. Therefore, these norms and ideals in science reporting are required to be factors that are universally acknowledged by science reporters and the stakeholders in science communication.

There is no second opinion required to acknowledge that the practice of simplification is necessary in science communication. For it is only with the help of analogies and metaphors that one can communicate complicated scientific concepts. However, respecting the thin line that separates simplification from oversimplification is necessary to effectively convey ideas. Simplification of concepts risks possible oversimplification by stripping the conceptual accuracy for the sake of clarity.

Finding human connections to make stories drive emotional impact and resonance is yet another factor necessary to engage the audience in the report. It is much more effective to report on a breakthrough that has a direct impact on a life rather than simply reporting the breakthrough. Humanising them would be successful in communicating the relevance of an occurrence in their lives. Additionally, showing the relevance of a scientific phenomenon or occurrence in the day-to-day lives of the masses can help the audience perceive the importance in a larger context. For instance, the coverage of climate change has suffered the consequence of being interpreted as a far-off event with little or no consequence to the human population in the past. It is only when the impact is covered on a closer geographical location or that of an evident consequence closer home, climate change is looked at with a modicum of vigilance.

Another means of enhancing effective science communication is to communicate ideas with a problem-solution framework in consideration. A problem-solution approach helps break down a complex problem for the benefit of the audience while giving them a closer look at the scientific process of solving it. Additionally, when the entire process is presented through a suitable narrative, the story could effectively bridge the gap of the understanding towards scientific inquiry. An instance could be taking the problems created by the use of single use plastic and coming up with a solution for the same. Moreover, the potential in the use of dramatisation and visualisation in the narrative remains unnoticed. Just because science has far-reaching consequences and is looked at with a serious connotation does not necessarily suggest that the presentation be serious. The use of dramatisation in stories of discoveries and scientific achievements like reaching the Southern Point with Chandrayaan 3 highlights human emotions involved in such pursuits. Additionally, the use of visual elements become essential to demonstrate the workings of a project that falls beyond the scope of understanding of common

masses. Further, the use of graphs and figures also help enhance the impact of a scientific coverage for individuals with good scientific temper and literacy.

Employing a speculative or forward-looking approach for enhancing engagement and effectively communicating the urgency. Although focused on present day studies, science communication is deeply rooted in the study of possible implications of events and occurrences in the future. Therefore, leveraging the insights of the different implications and consequences of varying events, science communication can effectively attract the attention of its audience wishing to know the future course of possibilities. Additionally, putting things into perspective could effectively communicate the urgency of discoveries and phenomenon.

Lastly, debates and topics concerning analytical and deeper understanding with personalization in crafting messages could enhance the impact of science communication in the lives of its audiences.

3.1. Narrative Styles:

Now, after taking care of the various approaches for effective communication from the aforementioned paragraphs, it is imperative to pay attention to the narrative style. The narrative defines the relevance of a story highlighting why one should care about a scientific breakthrough and how exactly is it going to affect them. It is understandable if the science content is of great significance but it will only go so far if the narrative fails to put forth why the story is of importance for the reader. Therefore, opting for the right narrative in storytelling doesn't only effectively communicate the essence of the story but also goes a long way in facilitating engagement with a story. Among the different types of storytelling are narrative storytelling, descriptive storytelling leaning more towards creating explanatory writing, conversational narrative, creating listicle-oriented science communication, and so on and so forth.

'Narrative Storytelling', to begin with, humanises stories to the extent that science coverage gets a personal touch with anecdotal or case story-based stories. In such storytelling the scientists involved in a breakthrough may get to share their challenges that inherently have a human touch. Similarly, when it comes to 'Descriptive Storytelling', the science stories are broken into easy to follow and step by step explanations. 'Question and Answer' for a narrative to communicate science remains equally effective. Often witnessed in presentations, question and answers serve to answer the dominant queries one might have regarding a subject. Moreover, this narrative picks the scientists' minds on how they would like to communicate an idea instead of a science reporter doing the job.

Similarly, 'Listicles' is yet another approach that is growing popular effectively making the communication crisp and concise by producing digestible pieces of science reports. And while 'Opinion Pieces' have a separate fan base in all of journalism due to the candid presentation of a story, they are equally relevant in science reporting. Lastly, owing to the rapid digitisation of communication, 'Interactivity and Immersive Narrative' in the presentation not only enhances the engagement but are equally sought for the sake of clarity in explaining complex concepts.

3.2. Headlines in Science Reporting

While being the first element of a news report to engage with the audience, headlines play a significant role summarising what the report has in store for its audience. When it comes to science reporting, it becomes increasingly critical to look into if the headline represents an accurate and relevant account while it deals with its primary most important task, i.e. to effectively employ its power of attracting attention. Because, when it comes to science reporting, the relevancy of the headline communicates the quality of the report. To set the audience up for something and to not deliver accordingly is a let-down that all forms of communication ought to avoid, let alone science communication.

3.3. Lead in Science Reporting

Second to the headline alone, the lead is the deciding factor for the audience to follow a science story any further. After the headline, the job to retain the attention of the audience and justify the headline lies on the lead. Therefore, not only does the lead reveal the core message and build credibility along the lines, it also encourages the attention of the audience further with clarity and relevance. The lead, hence, piques curiosity, shows how the story fits in the broader context, engages and gives reasons good enough to tread further.

3.4. Visual Storytelling in Science Communication

Visual Storytelling in the advancing day and age has become critical in science reporting. Be it infographics, charts, images, understanding a complex concept like that in science communication without any visual aid becomes a daunting task. Therefore, they not only increase the ease in the task but also are necessary for science reporting to effectively communicate to the audience. Simplification of complex data, aiding enhanced retention in the audience, and engaging audience are a few functions that Visual Storytelling quite effectively adds to. However, to be put to use, visual communication needs to have clarity, accuracy, it should be easy to interpret, and importantly avoid oversimplification for the audience. A few types of visual storytelling could be as follows:

Infographics: Presenting the combination of text and visuals, infographics effectively convey complex data in a simple yet attractive way while effectively summarising large amounts of information into small digestible content. Flowcharts, timelines, diagrams, etc. are a few examples of infographics that can be used in science communication.

Data Visualization: Using effective visual representations of quantitative data, trends, and patterns, data visualisation makes the data easy to interpret and understand. Bar graphs, heat maps, pie charts, scatter plots are a few examples of data visualisation.

Illustrations and Diagrams: Diagrams and Illustrations are age old to depict information pictorially. Especially helpful in instances where there seems to be an evident lack in reference and the imagination of the audience needs help. Molecular structures, diagrams, models are few instances using illustrations.

Animation: This kind of visual representation is a boon actualized by the evolution of technologies. Instances requiring a pictorial representation in the movement use animations for the same. Cell division, climate change progression are a few phenomena that can make use of animation to effectively convey the message.

Photography: Photojournalism remains to be an extremely impactful means of reporting something and that does not differ in case of science reporting. Real life examples in science reporting have no substitute at par with as much impact.

Motion Pictures or Videography: Audio-visual storytelling offers limitless possibilities in science reporting. From video essays, interviews, coverage of events, documentaries, the utility of videography knows no boundaries and hence, can be of immense value in science reporting.

Geospatial Visualisation: Geospatial visualisation can effectively make use of geographical data to show trends, developments across a specific location. These visualisations can help understand the pattern of change in a given time period and hence, help understand a phenomenon better. Spread of diseases, climate change maps, biodiversity in a geography, global science data pattern are a few occurrences whose pictorial representation in the form of geospatial visualisation could be effective.

Augmented Reality and Virtual Reality: Owing to the rapid developments in technology, augmented reality and virtual reality open up a new world of possibilities for science reporting. With the possibility of immersive experiences, interacting with science and exploration in scientific understanding can aid in the smooth transfer of

information and knowledge and much better reception in the audience.

IV. CONCLUSION

In an age where there is abundance of information and which is readily accessible, it often becomes overwhelming for the audience. Tailoring science news reporting by employing effective writing strategies can foster audience engagement. Science communication must put priority on clarity, relevance and storytelling to capture readers' attention. Simplifying complex scientific concepts without diluting their essence helps bridge the gap between experts and non-experts, enabling a broader audience to grasp and appreciate scientific developments. The integration of human-interest elements, such as real-world implications and personal narratives, enhances the relatability of science news, making it more engaging. Visual aids like infographics and videos further improve understanding, breaking down intricate ideas into digestible pieces. Additionally, interactive content, where audiences can engage directly with the material, creates a more immersive experience, fostering curiosity and deeper involvement. Tone and language must also be carefully considered to match the intended audience's knowledge level while maintaining journalistic integrity. Writers must ensure that the reporting remains accurate and evidence-based, balancing accessibility with credibility. A combination of clear communication, relatable narratives, and interactive engagement tools is essential for capturing and sustaining audience interest in science news, ultimately enhancing its socio-economic impact.

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