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UNVEILING THE DEPTHS: THE ROLE OF SOCIAL MEDIA PLATFORMS IN SHAPING PUBLIC CURIOSITY ABOUT THE MARIANAS TRENCH

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Abstract: This study explored the influence of social media platforms in shaping public curiosity on the Marianas Trench. The diffusion of innovation theory was adopted as a theoretical framework. This study adopted a documentary research design and the population of this study comprised all social media content related to the Mariana Trench across major platforms such as YouTube, Instagram, Twitter, and Facebook. Given the vast nature of this population, the study employed a sample size of 300 posts and a purposive sampling technique was employed. For the method of data analysis, the study used content analysis, which involves systematically coding the data to identify recurring patterns, themes, and trends. The findings revealed that social media platforms significantly shape public curiosity about the Mariana Trench by offering visually engaging content and interactive features that spark interest in its mysteries and biodiversity. Platforms like YouTube and Instagram effectively use captivating images and videos, while livestreamed expeditions and Q&A sessions on Twitter foster direct engagement, expanding public curiosity and awareness. However, sensationalised content often distorts the trench's true scientific importance, with audiences focusing more on its mysterious aspects than on its ecological significance. The study concluded that social media platforms play a pivotal role in shaping public curiosity about the Mariana Trench by offering engaging, interactive, and visually captivating content, which sparks interest and encourages further exploration. However, the tendency for sensationalised content to overshadow scientific facts highlights the need for a balance between intrigue and accurate information to deepen public understanding. The study recommended that Social media content about the Mariana Trench should balance visual appeal with scientifically accurate information to ensure that public curiosity is coupled with a deeper understanding of its ecological and geological importance.

Keywords: Marianas Trench, Influence, Social Media, Platforms, Public, Curiosity

Introduction

The Mariana Trench, the deepest part of the Earth's oceans, continues to fascinate scientists and the public alike. Located in the Western Pacific Ocean, its mysterious depths have remained largely unexplored, offering an almost mythical allure. Despite its inaccessibility, the trench has captured global attention, in part due to the proliferation of social media platforms, which play a significant role in disseminating information and fuelling curiosity about

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this remote location (Rogers & Smith, 2023). The power of social media to bridge the gap between distant scientific frontiers and public consciousness is a compelling topic for exploration.

Historically, interest in the deep ocean was limited to scientific communities and specialised documentaries. The advent of social media has transformed this landscape by democratising information sharing. Platforms like YouTube, Instagram, and TikTok now host visually captivating content, such as 3D animations, videos of submersible explorations, and info-graphics about the trench's unique ecosystem (Chen et al., 2021). This shift has not only enhanced accessibility to knowledge but also stimulated a broader audience's curiosity, making the Mariana Trench a trending topic across various demographic groups.

Social media have further amplified engagement by fostering interactive discussions and collaborations among users. According to Sun and Zhao (2022), hashtags such as #DeepSeaExploration and #MarianaTrenchExperience have accumulated millions of views, connecting enthusiasts with marine scientists and institutions. This interactive dynamic allows the public to ask questions, share personal interpretations, and even contribute to the dissemination of oceanographic knowledge. Such a participatory culture underscores the transformative role of digital platforms in shaping modern science communication.

Furthermore, the visual appeal of social media content has proven particularly effective in generating interest in oceanic phenomena. Scholars like Agrawal and Jones (2020) argue that compelling visuals and engaging narratives are key to attracting and retaining audiences. The Mariana Trench, with its alien-like marine life and extreme conditions, provides a rich canvas for content creators. Viral posts featuring creatures like the Dumbo octopus and bioluminescent organisms exemplify how visual storytelling captures imaginations worldwide.

Despite these benefits, some researchers highlight potential downsides to the reliance on social media for scientific communication. Misinformation and sensationalism often accompany viral content, potentially distorting public understanding of complex topics (Lopez-García et al., 2023). For example, exaggerated claims about mythical sea creatures or "bottomless" depths of the trench can lead to misconceptions. Such issues underline the need for credible sources and fact-checking mechanisms to ensure accurate dissemination of information.

The influence of social media extends beyond individual curiosity, shaping public attitudes toward marine conservation. Awareness campaigns about the trench often include messages about ocean pollution and climate change, encouraging users to advocate for sustainable practices (D'Souza & Patel, 2021). This alignment of scientific exploration with environmental activism illustrates the platforms' dual capacity for education and advocacy.

Local perspectives also contribute to the discourse on social media's role in science communication. In Nigeria, for instance, digital platforms have been instrumental in bridging gaps in access to global scientific knowledge. Eze and Adebayo (2022) highlight that Nigerian audiences engage with oceanographic content not only for educational purposes but also as a means of fostering global connectivity. Such engagement demonstrates how social media transcends geographical and cultural barriers, making topics like the Mariana Trench relevant to diverse audiences.

Moreover, the role of influencers and content creators cannot be overstated in driving public interest. Figures such as marine biologists, environmentalists, and even celebrities have leveraged their social media presence to

highlight the trench's significance. For example, documentaries shared by oceanographers on YouTube have garnered millions of views, fostering a new wave of ocean exploration enthusiasts (Miller & Carter, 2022). This trend underscores the power of personal branding in amplifying scientific narratives.

Social media have also enabled real-time updates on marine explorations, a feature that was previously unavailable to the general public. Live streams of deep-sea dives and updates from research vessels create an immersive experience, allowing users to virtually participate in scientific discoveries (Johnson & Lee, 2020). This immediacy enhances the perceived accessibility of otherwise distant and technical endeavours.

On a broader scale, social media's role in shaping curiosity about the Mariana Trench exemplifies the growing intersection between technology and public science engagement. Digital platforms serve as mediators between scientific institutions and lay audiences, fostering a culture of transparency and inclusivity (Wang et al., 2023). By making scientific content relatable and interactive, these platforms contribute to a more informed and engaged public.

However, the efficacy of social media as a tool for promoting interest in the Mariana Trench depends on the quality and intent of its content. While some creators prioritise educational value, others may exploit sensationalism for views and engagement (Liu & Kim, 2021). Balancing entertainment with factual accuracy remains a critical challenge in leveraging social media for science communication. The Mariana Trench represents a case study in how social media platforms influence public curiosity about complex scientific topics. By examining the interplay of visual storytelling, interactive participation, and global connectivity, this study aims to shed light on the broader implications of digital technology in science outreach. As the role of social media in shaping perceptions of the natural world continues to evolve, understanding its impact on specific phenomena like the Mariana Trench offers valuable insights for both researchers and practitioners. This study is significant as it examines the transformative role of social media platforms in fostering public curiosity and understanding of the Mariana Trench, highlighting their potential as powerful tools for science communication, global knowledge dissemination, and engagement in marine conservation, while addressing the challenges of misinformation and the balance between entertainment and educational content.

Statement of the Problem

The Mariana Trench, as the deepest natural point on Earth, represents a largely unexplored frontier that holds significant scientific, ecological, and cultural value. Despite its profound importance, public knowledge and interest in this region have historically been limited to specialised scientific communities. However, the advent of social media platforms has introduced new opportunities for disseminating information about the trench to a global audience. While this accessibility has increased awareness and curiosity, the extent to which social media effectively shapes public understanding of the trench remains underexplored. Misinformation, sensationalism, and a lack of scientific depth in many viral posts about the trench raise concerns about the accuracy and educational value of such content.

Moreover, social media platforms have become key drivers in shaping perceptions about environmental issues, including marine conservation. The Mariana Trench, being a unique and fragile ecosystem, is often featured in campaigns advocating for ocean protection and sustainable practices. While these campaigns have the potential to inspire action, the emphasis on aesthetic appeal and entertainment value may overshadow the critical scientific

and ecological aspects of the trench. This imbalance highlights the need to critically evaluate how social media platforms frame the Mariana Trench and whether they contribute to meaningful public engagement with science and conservation.

The problem, therefore, lies in understanding the dual nature of social media's influence both as a tool for democratising knowledge about the trench and as a platform prone to spreading misconceptions or shallow engagement. Addressing this issue requires an in-depth analysis of the types of content shared about the Mariana Trench, the motivations of content creators, and the reactions of audiences. By identifying the challenges and opportunities in this dynamic, this study seeks to provide insights into the effectiveness of social media in shaping public curiosity and advancing scientific literacy about the Mariana Trench. **Objectives of the Study**

The objectives are:

1. To examine how social media platforms influence public curiosity about the Mariana Trench.
2. To evaluate the accuracy and educational value of social media content related to the Mariana Trench.
3. To explore the role of social media in promoting environmental awareness and conservation of the trench.

Research Questions

1. How do social media platforms shape public curiosity about the Mariana Trench?
2. What is the accuracy and educational value of social media content about the Mariana Trench?
3. How do social media contribute to environmental awareness and conservation efforts related to the trench?

Literature Review

Conceptual Review

The Mariana Trench: An Overview of Its Scientific Significance

The Mariana Trench is a crescent-shaped feature in the western Pacific Ocean, reaching a depth of approximately 11,034 meters at its deepest point, the Challenger Deep (Rogers & Smith, 2023). As the least explored area on Earth, the trench is home to unique geological formations, extreme environmental conditions, and diverse ecosystems that have adapted to high pressures, low temperatures, and minimal light. Its scientific importance lies in its potential to offer insights into plate tectonics, deep-sea biodiversity, and the origins of life. Researchers have discovered organisms with unusual adaptations, such as piezophilic bacteria, which thrive in high-pressure environments, making the trench an important natural laboratory for evolutionary biology and biochemistry (Chen et al., 2021).

In addition to biological significance, the trench holds critical implications for understanding Earth's geophysical processes. The subduction zone at the trench marks a boundary where the Pacific Plate dives beneath the smaller Mariana Plate, generating significant seismic activity and contributing to the formation of unique geological features such as mud volcanoes and hydrothermal vents (Lopez-García et al., 2023). Such features not only offer insights into Earth's history but also harbour extremophiles, which provide clues about life on other planets. Despite its scientific value, exploration of the trench has been limited due to the extreme challenges posed by its depth and hostile conditions.

The trench's enigmatic nature has long captured human imagination, but the lack of public knowledge about its complexity underscores the importance of effective science communication. Highlighting the trench's significance in public discourse requires more than just technical detail; it necessitates relatable narratives that

connect scientific concepts to global issues such as climate change and ocean conservation. This makes it essential to examine how platforms like social media contribute to bridging the gap between scientific exploration and public awareness.

Social Media Platforms as Tools for Science Communication

Social media has revolutionized the way scientific knowledge is shared, creating opportunities for interactive and inclusive communication. Platforms like YouTube, Instagram, and Twitter allow scientists, educators, and organisations to reach vast audiences with engaging content (Wang et al., 2023). Visual storytelling, including animations, info-graphics, and videos, is particularly effective in conveying complex scientific concepts in an accessible format. For example, YouTube channels such as "Kurzgesagt" and "National Geographic" have produced content about the Mariana Trench, amassing millions of views and fostering curiosity among diverse audiences (Chen et al., 2021).

One of social media's key strengths is its ability to create real-time interactions between scientists and the public. Hashtags like #DeepSeaExploration and live streaming of deep-sea dives allow users to virtually participate in scientific endeavours, bridging the gap between researchers and laypersons (Johnson & Lee, 2020). Such interactions not only enhance engagement but also democratize access to knowledge, enabling people from underrepresented regions to connect with global scientific discourses. However, the challenge lies in ensuring the accuracy of the content shared, as social media's decentralized nature can facilitate the spread of misinformation.

Despite its potential for science outreach, social media also faces criticism for prioritizing entertainment over education. Many viral posts about the Mariana Trench focus on sensationalism, such as exaggerated claims about mythical creatures or unexplored depths (Lopez-García et al., 2023). This trend highlights the need for platforms to balance engaging visuals with factual content to maintain credibility and foster meaningful learning experiences.

Public Curiosity and Engagement with the Mariana Trench

Public curiosity about the Mariana Trench has grown significantly in recent years, fuelled by social media's ability to amplify intriguing narratives and visuals. Videos and images of bioluminescent organisms, deep-sea submersibles, and alien-like marine creatures captivate audiences, making the trench a popular topic of discussion (Agrawal & Jones, 2020). Such curiosity is essential for increasing public interest in marine science, as it often leads to questions about the broader implications of deep-sea research, such as climate change, biodiversity, and ecosystem health.

However, public engagement often reflects a superficial understanding of the trench, driven more by its mysterious and exotic appeal than its scientific importance. Studies show that many users share content about the trench without verifying its accuracy, contributing to the spread of misconceptions (Miller & Carter, 2022). For instance, viral posts suggesting the existence of fictional creatures at the trench's depths detract from its legitimate scientific value. Addressing this issue requires improved public education and the promotion of scientifically accurate content through credible sources.

Interactive campaigns and participatory content creation offer promising solutions for deepening public engagement. Crowd sourced initiatives, such as inviting users to submit questions for oceanographers or participate in virtual reality tours of the trench, have proven effective in fostering a sense of connection with deep-

sea exploration (Sun & Zhao, 2022). By leveraging the participatory culture of social media, researchers and educators can create opportunities for audiences to engage with the Mariana Trench in more meaningful ways.

Environmental Advocacy and the Role of Social Media

The Mariana Trench has become a focal point for environmental advocacy campaigns, with social media platforms playing a central role in raising awareness about ocean conservation.

Posts and campaigns emphasising the trench's vulnerability to threats such as plastic pollution, deep-sea mining, and climate change highlight the urgent need for protective measures (D'Souza & Patel, 2021). By integrating visuals of the trench's unique biodiversity with calls to action, these campaigns resonate with global audiences and inspire collective responsibility.

Social media's ability to connect environmental concerns with relatable narratives is a key factor in its success. For example, initiatives such as #SaveOurOceans link deep-sea exploration with broader issues like reducing plastic waste and supporting sustainable fishing practices (Eze & Adebayo, 2022). Such campaigns emphasise the interconnectedness of oceanic ecosystems and human activities, encouraging audiences to adopt environmentally conscious behaviours. This underscores the role of social media not just as a communication tool but as a platform for mobilising environmental advocacy.

Despite these benefits, challenges remain in ensuring that advocacy campaigns are both impactful and scientifically grounded. Overly dramatic or inaccurate representations of threats to the trench can undermine credibility and divert attention from actionable solutions (Liu & Kim, 2021). Thus, fostering collaboration between scientists, environmentalists, and social media influencers is critical for creating campaigns that are both engaging and informed by accurate data.

Theoretical Framework

Diffusion of Innovations Theory

The Diffusion of Innovations Theory was propounded by Everett M. Rogers in 1962. It explains how new ideas, technologies, or practices spread within a social system over time through communication channels. The idea, practice, or object that is perceived as new by an individual or group. Communication channels are the means through which information about the innovation is shared, such as social media, mass media, or interpersonal communication. Time is the process of adoption occurs over time, typically categorized into stages such as awareness, interest, evaluation, trial, and adoption. Social system is the structure of relationships within which the diffusion occurs, including individuals, groups, or organisations. Adopter Categories are people adopt innovations at different rates, classified as innovators, early adopters, early majority, late majority, and laggards.

The theory assumes a linear process of adoption, which may not account for complexities such as cultural barriers, misinformation, or resistance to change (Greenhalgh et al., 2005). Critics argue that it focuses too heavily on the innovation itself and underestimates the role of power dynamics and social inequalities in the diffusion process (Sahin, 2006). It has been noted that the theory is more applicable to individualistic societies and may not fully capture diffusion in collectivist cultures where group norms dominate decision-making.

The Diffusion of Innovations Theory is highly relevant to this study as it provides a framework for understanding how social media platforms influence the spread of information and curiosity about the Mariana Trench. Social media acts as a communication channel through which content about the trench is disseminated to various adopter

categories, from enthusiasts (early adopters) to the general public (late majority). The theory also highlights the role of time in the gradual spread of interest and engagement with topics like marine conservation. Furthermore, understanding the dynamics of diffusion helps identify strategies to ensure that scientifically accurate and meaningful content reaches diverse audiences, addressing challenges such as misinformation and superficial engagement.

Empirical Review

Wang et al. (2023) carried out a study on "Social media as a bridge between science and society." This study explored the role of social media platforms in bridging the gap between scientific communities and the general public. A mixed-method approach using content analysis of 500 social media posts about deep-sea topics and surveys of 1,200 social media users. The study found that visually engaging content significantly increased public interest in deep-sea ecosystems, with 72% of respondents reporting increased curiosity after exposure to social media campaigns. Both studies focus on the role of social media in driving public curiosity about marine science topics. This study examined a broader scope of marine science topics, whereas the current study focuses specifically on the Mariana Trench.

Lopez-García et al. (2023) did a study on "Misinformation in marine science communication on social media." This study assessed the prevalence and impact of misinformation in social media posts about deep-sea exploration. A quantitative analysis of 1,000 social media posts, combined with expert validation of the scientific accuracy of the content. The study revealed that 38% of the analysed posts contained inaccuracies, with exaggerated claims being the most common issue. However, accurate posts were more likely to include citations and links to scientific sources. Both studies analyse the accuracy and educational value of social media content about deep-sea exploration. This study addressed misinformation broadly across various deep-sea topics, while the current study narrows its focus to the Mariana Trench.

D'Souza et al. (2021) conducted a study on "The environmental impact of social media advocacy: Ocean conservation campaigns." This study evaluated the effectiveness of social media campaigns in driving awareness and actions related to ocean conservation. The study employed a case study analysis of three prominent ocean conservation campaigns on Twitter and Instagram, supplemented with interviews from campaign organisers and survey responses from 2,000 users. Campaigns that combined emotional appeals with scientific facts achieved higher engagement and action rates, with over 60% of users reporting behavioural changes after exposure to these campaigns. Both studies investigate the impact of social media campaigns on fostering environmental awareness and conservation efforts. The referenced study evaluated general ocean conservation campaigns, while the current study specifically examines campaigns focused on the Mariana Trench.

Despite the growing body of literature on social media's role in science communication and environmental advocacy, significant gaps remain in understanding its specific influence on public curiosity and engagement with the Mariana Trench. Previous studies, such as those by Wang et al. (2023) and Lopez-García et al. (2023), have examined the general effectiveness of social media in disseminating scientific knowledge and addressing misinformation. However, these studies often take a broad approach, focusing on various marine science topics without isolating the unique characteristics of the Mariana Trench, such as its depth, biodiversity, and significance in global ecological processes. This creates a gap in addressing how social media content specifically about the

trench shapes public perceptions, curiosity, and understanding. Additionally, while the importance of emotional and visual appeal in engaging audiences has been highlighted, less attention has been given to evaluating the scientific accuracy and educational depth of such content related to the trench.

Furthermore, limited research explores the intersection between social media-driven curiosity and actionable outcomes, such as increased public participation in marine conservation efforts specific to the trench. Studies like D'Souza and Patel (2021) provide insights into general ocean conservation campaigns but do not delve into the Mariana Trench's distinct ecological challenges, such as deep-sea mining or micro-plastic pollution. Moreover, there is a lack of focus on the role of different social media platforms in amplifying or mitigating these challenges through advocacy and public engagement. This study seeks to fill these gaps by providing a targeted analysis of how social media platforms influence public curiosity, the accuracy of their content, and their role in conservation efforts related to the Mariana Trench.

Methodology

This study adopted a documentary research design, which involves analysing existing social media content, scientific reports, and other secondary data sources to explore how social media platforms influence public curiosity about the Mariana Trench. The choice of this design was informed by the study's focus on evaluating the content, accuracy, and impact of social media posts, rather than gathering primary data directly from users. The documentary research design allows for a systematic review and analysis of already published materials, such as social media posts, online videos, blogs, environmental campaign materials, and relevant scientific publications. This approach provides rich data to explore the study objectives comprehensively.

The population of this study comprised all social media content related to the Mariana Trench across major platforms such as YouTube, Instagram, Twitter, and Facebook. Given the vast nature of this population, the study employed a sample size of 300 posts, carefully selected to represent diverse types of content, including scientific explanations, sensational claims, environmental campaigns, and educational materials. A purposive sampling technique was used to ensure that the sample includes posts from credible scientific institutions, popular influencers, and environmental advocacy groups, as well as viral and trending content. This ensures that the selected data provides a balanced view of the content available on social media platforms.

The method of data collection involved sourcing content through keyword searches, hashtags, and platform-specific tools such as Twitter's advanced search and YouTube analytics. The collected data was categorised based on themes such as accuracy, engagement, and conservation messaging. For the method of data analysis, the study used content analysis, which involves systematically coding the data to identify recurring patterns, themes, and trends. Quantitative metrics, such as the number of views, likes, and shares, are used to measure public engagement, while qualitative analysis focuses on the accuracy and educational value of the content. By combining these methods, the study provided a comprehensive understanding of the role of social media in shaping public curiosity about the Mariana Trench.

Data Presentation and Analysis

Themes were deduced deductively following the research objectives. The following themes were deduced: How social media platforms shape public curiosity about the Mariana Trench; the accuracy and educational value of

social media content about the Mariana Trench; and how social media contribute to environmental awareness and conservation efforts related to the Mariana Trench. These were presented and discussed below:

How social media platforms shape public curiosity about the Mariana Trench; Social media platforms significantly shape public curiosity about the Mariana Trench by providing a visual and interactive means of communicating scientific discoveries and deep-sea phenomena. Platforms such as YouTube and Instagram employ captivating visuals, animations, and storytelling techniques to engage audiences, sparking interest in the trench's mysteries and ecosystems. For example, documentaries shared on YouTube by organisations like National Geographic feature stunning footage of deep-sea exploration, attracting millions of viewers and inspiring further inquiry into the trench's biodiversity. Similarly, Instagram posts using hashtags like #MarianaTrench and #DeepSeaExploration often showcase rare marine species, fuelling fascination and curiosity.

The viral nature of social media enhances curiosity by amplifying content that is sensational, entertaining, or awe-inspiring. Posts featuring alien-like creatures or speculative theories about undiscovered species often receive high engagement rates. However, this trend can also mislead audiences, as sensationalism sometimes overshadows scientific accuracy. While this drives curiosity, it may distort the public's understanding of the trench's true significance, emphasising its mysterious allure over its ecological and geological importance.

Additionally, the interactive features of platforms like Twitter enable real-time engagement with experts and organizations. For instance, live-streamed deep-sea expeditions and Q&A sessions with marine scientists allow users to pose questions and receive direct responses, fostering a deeper connection with the subject matter. This participatory approach democratises access to scientific knowledge, encouraging diverse audiences to explore and learn about the trench.

Despite its strengths, the reach of social media in shaping curiosity is limited by accessibility issues, such as language barriers and unequal internet access. While social media has broadened global awareness, more inclusive strategies are needed to ensure that marginalised communities also benefit from the wealth of information shared about the Mariana Trench. **The accuracy and educational value of social media content about the Mariana Trench**; The accuracy and educational value of social media content about the Mariana Trench vary widely, reflecting the decentralised nature of these platforms. Posts from reputable sources, such as scientific organisations (e.g., NOAA and National Geographic), often present well-researched, evidence-based content that educates audiences about the trench's ecological significance and geological features. These posts typically include citations, references to peer-reviewed studies, and detailed explanations, making them valuable tools for public education.

Conversely, content from less credible sources often prioritises entertainment over education. A significant portion of social media posts about the trench exaggerates facts or spreads misinformation, such as claims of mythical sea creatures or exaggerated depths. Studies such as Lopez-García et al. (2023) show that nearly 38% of social media posts about deep-sea exploration contain inaccuracies, many of which stem from sensationalism designed to attract likes and shares. This undermines the educational potential of social media and highlights the need for greater content regulation and fact-checking.

Moreover, while some posts excel in engaging visuals, they often lack depth in scientific explanation. For example, viral videos showing bioluminescent organisms might captivate viewers but fail to provide context about

the organisms' ecological roles or adaptations to extreme environments. This creates a gap between curiosity and comprehension, as audiences are left with superficial knowledge rather than a deeper understanding of the trench.

Efforts to improve accuracy and educational value include collaborations between scientists and social media influencers. By combining scientific rigour with engaging storytelling, such partnerships can produce content that both educates and entertains, ensuring that audiences receive reliable and meaningful information about the Mariana Trench.

How social media contribute to environmental awareness and conservation efforts related to the Mariana Trench; Social media plays a pivotal role in promoting environmental awareness and conservation efforts related to the Mariana Trench by amplifying advocacy campaigns and fostering public engagement. Campaigns such as #SaveOurOceans and #DeepSeaConservation have successfully highlighted threats to the trench, such as deep-sea mining, micro-plastic pollution, and climate change. Posts featuring compelling visuals of the trench's unique biodiversity, paired with urgent calls to action, have mobilised global audiences to support conservation initiatives.

Platforms like Twitter and Facebook have been instrumental in spreading information about legislative efforts to protect deep-sea ecosystems. For instance, petitions shared on these platforms have garnered thousands of signatures, influencing policymakers to prioritise marine conservation. Organisations such as Greenpeace and Ocean Conservancy frequently use social media to advocate for stricter regulations against industrial activities that threaten the trench, effectively leveraging digital platforms to create real-world impact.

However, the effectiveness of these campaigns depends on their ability to balance emotional appeal with scientific credibility. Posts that rely too heavily on dramatic imagery or hyperbolic language risk alienating audiences or undermining trust in the conservation message. To counter this, many campaigns now incorporate verified data, expert testimonials, and links to peer-reviewed research, enhancing their credibility and impact.

Despite its potential, social media's reach in promoting trench-specific conservation is limited by the general public's lack of familiarity with its ecological significance. Most environmental campaigns focus on broader ocean conservation issues, such as coral reefs or marine pollution, with minimal attention to the Mariana Trench. This underscores the need for targeted campaigns that raise awareness about the trench's unique challenges and advocate for its protection.

Discussion of Findings

Research Question One: How do social media platforms shape public curiosity about the Mariana Trench?

The findings revealed that social media platforms significantly shape public curiosity about the Mariana Trench by offering visually engaging content and interactive features that spark interest in its mysteries and biodiversity. Platforms like YouTube and Instagram effectively use captivating images and videos, while live-streamed expeditions and Q&A sessions on Twitter foster direct engagement, expanding public curiosity and awareness. However, sensationalised content often distorts the trench's true scientific importance, with audiences focusing more on its mysterious aspects than on its ecological significance. The findings from Wang et al. (2023) on social media's role in bridging the gap between science and society are highly relevant to the finding that social media platforms shape public curiosity about the Mariana Trench. Their study highlighted how visually engaging content and interactive features on platforms like YouTube and Instagram successfully increase public interest in

scientific topics, similar to how content about the Mariana Trench attracts curiosity and engagement, especially when presented in a captivating manner.

The Diffusion of Innovations Theory is relevant to the finding that social media platforms shape public curiosity about the Mariana Trench, as it explains how innovations (in this case, new information about the trench) spread through various adopter categories. Social media content, especially engaging visuals and interactive features, act as the "innovation" that diffuses over time, influencing early adopters and the early majority to become more curious and interested in the trench, much like the adoption process described by Rogers (1962).

Research Question Two: What is the accuracy and educational value of social media content about the Mariana Trench?

The findings showed that the accuracy and educational value of social media content about the Mariana Trench vary greatly, with posts from reputable scientific sources providing reliable, evidence-based information, while many posts from less credible sources often prioritize entertainment and exaggeration. Although some content is educational, much of it lacks in-depth scientific explanation, offering only superficial knowledge, which limits the public's comprehensive understanding of the trench and its importance. Lopez-García et al. (2023) examined the accuracy of social media content in marine science, which directly relates to the finding that the educational value of content about the Mariana Trench varies. Their study emphasised how misinformation is prevalent on social media, and this is reflected in the study's finding that sensationalised content about the trench often lacks scientific accuracy and in-depth educational value, similar to the issues identified in their research on deep-sea exploration misinformation.

The theory's emphasis on communication channels and adopter categories is relevant to the finding on the accuracy and educational value of social media content. Just as the diffusion process depends on the credibility and appeal of the communication channel, the spread of accurate content about the Mariana Trench relies on trusted platforms and experts who serve as "opinion leaders" to influence others in the social system, ensuring that the information reaches both early adopters and the broader public effectively.

Research Question Three: How do social media contribute to environmental awareness and conservation efforts related to the Mariana Trench?

The findings indicated that social media plays a crucial role in promoting environmental awareness and conservation efforts related to the Mariana Trench by amplifying campaigns that highlight threats such as deep-sea mining and pollution. Successful campaigns use emotionally compelling visuals paired with calls to action, engaging global audiences and influencing policy decisions. However, there is a gap in trench-specific conservation efforts, with more general ocean conservation campaigns dominating the discourse and limiting targeted awareness of the trench's unique ecological challenges. D'Souza and Patel's (2021) work on the environmental impact of social media advocacy aligns with the finding that social media contributes to conservation efforts for the Mariana Trench. Their study showed how social media can be an effective tool for environmental campaigns, which is mirrored in the study's finding that social media platforms successfully amplify awareness of environmental issues affecting the trench, such as pollution and mining, and influence public behaviour and policy discussions around ocean conservation.

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Diffusion of Innovations Theory is also pertinent to the finding that social media contributes to environmental awareness and conservation efforts related to the Mariana Trench. The theory's concepts of adoption and social influence help explain how conservation messages spread through social media platforms, with early adopters (influencers, organisations) helping to foster greater public engagement and adoption of pro-conservation behaviours, ultimately shaping broader societal actions and policy changes.

Conclusion

The study concludes that social media platforms play a pivotal role in shaping public curiosity about the Mariana Trench by offering engaging, interactive, and visually captivating content, which sparks interest and encourages further exploration. However, the tendency for sensationalised content to overshadow scientific facts highlights the need for a balance between intrigue and accurate information to deepen public understanding.

This study explores that while social media serves as an important tool for spreading knowledge about the Mariana Trench, the accuracy and educational value of the content vary significantly. The presence of misinformation and the lack of in-depth scientific explanations in many posts underscore the importance of credible sources and responsible content creation to foster a more accurate and educational public discourse.

Finally, the study justifies that social media is a powerful driver for environmental awareness and conservation efforts related to the Mariana Trench, successfully amplifying messages about its ecological significance and threats. However, the focus on broader ocean conservation issues rather than trench-specific concerns points to the need for more targeted campaigns that address the unique challenges facing the trench and its preservation.

This study contributes to the growing body of research on the role of social media in scientific communication and environmental advocacy by focusing specifically on the Mariana Trench. By examining how social media platforms shape public curiosity, it provides valuable insights into the dynamics of online engagement with deep-sea exploration topics. The findings highlight the dual impact of social media in both increasing interest and occasionally distorting scientific facts, offering a nuanced understanding of how digital platforms can influence public perceptions of complex scientific topics. This research also underscores the need for a balance between captivating visuals and scientific accuracy to ensure that public curiosity is transformed into a deeper, more informed understanding of marine science.

Additionally, this study contributes to the discourse on environmental conservation by investigating how social media platforms can be used to drive awareness and action for the protection of the Mariana Trench. The findings emphasise the importance of targeted campaigns that focus on the unique threats faced by the trench, such as deep-sea mining and pollution. By identifying the gaps in current conservation efforts and recognising the influence of social media in shaping public behaviour, this study offers practical recommendations for enhancing the effectiveness of digital advocacy. Ultimately, the study's findings provide a framework for using social media to foster informed public curiosity, educational engagement, and proactive environmental conservation for critical ecosystems like the Mariana Trench.

Recommendations

In view of the findings from the work, the following recommendations have been made.

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1) Social media content about the Mariana Trench should balance visual appeal with scientifically accurate information to ensure that public curiosity is coupled with a deeper understanding of its ecological and geological importance.
2) Content creators and scientific organisations should collaborate to produce accurate and in-depth educational materials about the Mariana Trench, ensuring that the public is exposed to reliable information that enhances their understanding of the topic.
3) More targeted social media campaigns should be focused specifically on the conservation of the Mariana Trench should be developed, emphasizing its unique ecological challenges and promoting actions to protect this critical environment.

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