A JOURNAL BY SISSA MEDIALAB

JCom

SPECIAL ISSUE
Science communication in unexpected places

ARTICLE

Scrolling through science: how accurate is science content on TikTok

Ricardo Morais and Clara Eloïse Fernandes

Abstract

TikTok has become a popular platform for science communication, particularly among younger audiences, allowing creators to reach broader audiences. However, concerns about the accuracy of science content shared on the platform have emerged, prompting this study to investigate the reliability of informal science communication by popular creators. Informal science communication is the casual sharing of scientific information on platforms like TikTok. The main objective is to assess how well this content adheres to established scientific principles and avoids misinformation. By analysing videos from creators with significant followings, we will evaluate their adherence to scientific accuracy and identify factors that influence it, such as the creators' backgrounds and platform algorithms. The findings will highlight trends in the accuracy of content, with some creators producing reliable information while others risk spreading misinformation. Ultimately, the research will provide recommendations for enhancing the accuracy of science content on TikTok, promoting critical thinking among viewers, and advancing informed science communication on social media.

Keywords

Decolonising science communication; Science and media; Digital science communication

Received: 10th June 2025
Accepted: 30th December 2025
Published: 11th February 2026

1 ▪ Introduction

TikTok has quickly gained popularity in recent years, particularly among younger audiences [J. Zeng et al., 2020; Hargittai et al., 2018]. Since its launch in 2016, it has changed how we interact with video content, enabling users to create and share short clips. This has led to a diverse range of content creators, including those focused on educational topics, revitalising science communication on the platform [Bautista & Vite León, 2022; Zawacki et al., 2022; Radin & Light, 2022; Habibi & Salim, 2021; J. Zeng et al., 2020]. In this context, it is crucial to clarify, based on the work of Arriagada and Ibáñez [2020], that the term "content creator" has emerged as a broad label for digitally enabled cultural producers who generate and share content on social media platforms, often fueled by entrepreneurial ambitions to establish their own "media brands" [Craig, 2019]. However, these creators exhibit distinct approaches, as noted by Scolere et al. [2018], who describe their efforts to build "platform-specific self-brands" and which leads to us talking about different profiles when we refer to YouTubers, Instagrammers or TikTokers [Arriagada & Ibáñez, 2020]. Moreover, researchers like Nguyen and Diederich [2023] and Rein [2023] emphasise TikTok's potential to make science more accessible and engaging for audiences often overlooked by traditional media.

TikTok's novelty and widespread appeal as a medium for scientific communication come with potential benefits and significant concerns. On one hand, the platform's design encourages the dissemination of knowledge in a manner that fosters audience engagement and understanding. Many creators leverage humour, aesthetics, and relatable narratives to convey scientific information, making complex concepts more digestible for viewers [J. Zeng et al., 2020]. However, the casual style of informal science communication also raises critical questions about the accuracy of the information being shared [M. Zeng et al., 2025; Aragon-Guevara et al., 2025; Ninan, 2025; K. Chen et al., 2022; Xue et al., 2022; Schäfer, 2021; Fraticelli et al., 2021; Kong et al., 2021a, 2021b; Hansen, 2016]. The line between reliable content and sensationalised information can blur easily, leading to misinformation, often propagated by well-meaning individuals and those without a strong scientific background [Hilary & Dumebi, 2021; Shu et al., 2020].

In exploring the landscape of informal science communication on TikTok, it is essential to define what this term encompasses. Informal science communication refers to the sharing of scientific information through non-traditional channels, emphasising a casual and approachable style that appeals to a broad audience [Nguyen & Diederich, 2023; J. Zeng et al., 2020; Rowan, 2012; Bell et al., 2009]. This connotation resonates with TikTok's user-driven content creation, where individuals can gravitate towards science topics, often framing them in a way that prioritises entertainment over scholarly rigour. The potential for informal communication to deviate from established scientific principles necessitates a closer examination of the accuracy of such content.

This study explores the accuracy of informal science communication provided by popular science creators on TikTok. The objective is clear: assess how well the scientific content adheres to established scientific principles and identify the prevalence of misinformation [Sidorenko Bautista et al., 2021; Bhargava et al., 2023]. By analysing a curated selection of videos from popular science communication creators who have garnered significant followings, we will critically evaluate the scientific integrity of their content. To conduct this investigation, we will select a sample of influential TikTok creators focused on science communication, chosen for their substantial following and impact. Analysing their videos will

offer insights into community standards for scientific accuracy, including adherence to norms, evidence-based claims, and potential contributions to misinformation [O'Sullivan et al., 2022].

An essential component of our analysis includes exploring factors that may influence the accuracy of science content on TikTok. The creators' backgrounds and expertise are critical elements, as their qualifications in the relevant scientific fields can significantly dictate the quality of the information they present. However, the nature of the topic itself also plays a role. Some scientific subjects may inherently be more complex or contentious, leading to a greater likelihood of misunderstandings or misrepresentations.

TikTok's algorithms' intricacies further complicate the science communication landscape [Zawacki et al., 2022]. These algorithms dictate which videos are promoted to users, meaning that content that garners higher engagement, regardless of its accuracy, can become more visible to a broader audience. This feature creates potential risks, as sensationalised or misleading content could overshadow scientifically accurate information simply due to its appeal. Understanding the interplay between content creation and algorithmic promotion is vital for assessing content on the platform [Zawacki et al., 2022].

This article is divided into three sections. The first reviews the literature on TikTok's potential for enhancing science communication and addresses challenges related to credibility and misinformation. The second section outlines our methodological procedures, including account selection and evaluation criteria. Finally, we present key findings and compare them to existing research. The article concludes by reflecting on research limitations and offering recommendations for future studies, emphasising the need for consumers to critically assess scientific information on social media platforms.

2 ▪ Literature review

2.1 ▪ *The potential of social media for science communication*

Science communication can be classified into three primary categories, as outlined by Hodson [2020]. The first category involves scientific communication, typically through research journals and conference presentations. The second category focuses on the dissemination and outreach of knowledge generated by the scientific community, utilising various channels such as newspapers, academic journals, television, and online platforms. Finally, the third category encompasses formal education, which relies on textbooks and other educational materials to convey scientific information. Each category is essential in fostering understanding and promoting accurate representation of scientific knowledge [Velarde-Camaqui et al., 2024].

Nevertheless, the landscape of how scientific information reaches the public has been profoundly reshaped by the rise of social media, which has emerged as a formidable tool for science communication [Metag et al., 2023; J. Zeng et al., 2020; Huber et al., 2019; Davies & Hara, 2017; Brossard, 2013; Peters et al., 2014], especially in engaging young audiences [J. Zeng et al., 2020; Hargittai et al., 2018]. Once primarily confined to academic journals and formal conferences, research findings can now be shared directly with a vast global audience, democratising access to scientific knowledge and making it more inclusive [Metag et al., 2023]. "We encounter science on diverse platforms, such as a daily newspaper's newsfeed,

Facebook or Instagram posts from NGOs or other activists, scientists' podcasts on Spotify or video clips on TikTok, the posts of science enthusiasts on Reddit, science sceptics' videos on YouTube, or tweets from lobby groups and social movements containing scientific charts and figures on Twitter" [Fähnrich et al., 2023, pp. 605–606].

One key advantage of social media is its ability to enable real-time engagement between scientists and the public. Researchers can interact directly with audiences, answering questions and clarifying concepts, which fosters mutual understanding [Metag et al., 2023; Schäfer, 2017]. This immediacy not only humanises scientists but also makes research more relatable. For instance, a researcher might share a video about a recent discovery or host a live Q&A session on a medical advancement. These interactions promote transparency and trust, essential in combating misinformation [Metag et al., 2023].

Moreover, social media excels at translating complex scientific concepts into more digestible formats. Through the use of infographics, short educational videos, eye-catching images, and compelling narratives, intricate scientific research can be distilled into manageable snippets. This transformation significantly makes science less intimidating for non-specialists and fosters a greater interest in scientific literacy [Metag, 2021]. The capacity for rapid dissemination of accurate information can be vital during urgent public health crises, where timely updates can have significant implications for community well-being. In sharing evidence-based insights, scientists contribute to informed discourse and proactively combat misinformation and pseudoscience, thereby enhancing public trust in scientific findings.

Social media not only aids public outreach but also facilitates networking among scientists from various institutions and countries. This connectivity fosters interdisciplinary research, accelerating innovation. Additionally, it allows scientists to advocate for their fields and raise awareness on critical global issues like climate change and public health, potentially influencing policy changes through widespread campaigns.

Among the social media that can be used to communicate science, studies have shown that platforms that rely on video are among those that best serve to communicate science [Montes et al., 2025]. Due to their popularity and multimodal nature, video-sharing platforms are ideally suited for conveying scientific content [Allgaier, 2018, 2019; León & Bourk, 2018]. Audiovisual media can utilise various methods to present and visualise scientific ideas, including images, animations, techniques like time-lapse or slow motion, and different languages and subtitles. Luzon [2019] noted that "online science videos are multimodal texts which draw on several modes or semiotic resources (e.g., non-verbal sound, spoken and written language, images) to re-contextualise scientific discourse" [2019, p. 170].

According to J. Zeng et al. [2020], traditional public science communication is framed through three models: the deficit, public engagement, and marketplace. The deficit model involves scientists simplifying their findings for the audience, primarily using one-way communication via platforms like YouTube. The public engagement model emphasises a two-way conversation, which is more common among amateur science YouTubers, whose content often outperforms professional organisations due to their ability to connect personally with audiences. Finally, the marketplace model addresses debates in science communication, particularly on controversial topics, where scientists and vloggers express opinions, but research indicates that people may view them as less credible.

These three models help analyse elements of science communication across videos on some social media platforms, as highlighted by J. Zeng et al. [2020]. Still, the authors themselves point out that the distinctive features of science communication on TikTok don't easily align with these models, which requires highlighting the characteristics of the platform, but also the type of science communication that we can find on it, which we will do in the next point.

2.2 ▪ *TikTok history and its unique characteristics for science communication*

TikTok, developed by ByteDance Ltd., a Beijing-based tech startup founded by CEO Yiming Zhang in 2012, has a unique origin story. It began with three apps, starting with Musical.ly in 2014, allowing users to lip-sync. In 2016, ByteDance launched a similar app in China called Douyin, followed by the international launch of TikTok. In 2017, ByteDance acquired Musical.ly and rebranded it as TikTok, leading to its global popularity [Schwartz, 2025].

As of January 2025, TikTok ads reached 1.59 billion users, making it the fourth most popular social media platform outside China. This corresponds to about 19.4% of the global population, although advertising reach doesn't directly reflect the total user base. Notably, ByteDance restricts TikTok access to users aged 13 and older, suggesting that the adoption rate among eligible users could be higher [DataReportal, 2025].

The number of TikTok users is projected to grow by 4.2% in 2025, reaching approximately 2.14 billion worldwide. By 2029, analysts estimate that this figure will climb to 2.35 billion. Indonesia currently boasts the most extensive user base, with 165.1 million users, followed by the United States with 137.9 million and Brazil with 111.3 million. While TikTok's total user count is expected to keep rising until at least 2029, growth rates are forecasted to decelerate. In 2026, a 2.9% increase is anticipated, bringing the global user count to about 2.2 billion. From 2026 to 2029, experts predict annual growth rates of less than 3%, ultimately resulting in a projected user base of 2.35 billion by 2029 [Statista, 2023].

According to the insights obtained from TikTok's planning tools, DataReportal's analysis indicates that the average age of TikTok users in January 2025 was between 25 and 34. Additionally, the data from TikTok's advertising planning tools reveals that males within the 25 to 34 age bracket represented the largest segment of active users during this period.

TikTok is a short-form video app that enables users to create content featuring music, filters, text, and camera effects directly from their mobile devices. The app can be downloaded for free from both the Apple App Store and Google Play Store. Initially, TikTok videos were limited to one minute in length, but in late summer 2021, the duration was extended to three minutes [Kirchhoff, 2021]. Additionally, users now have the option to upload a single video file of up to ten minutes from their device [Zawacki et al., 2022].

TikTok features two main content feeds: "Following" and "For You." When users open the app, videos autoplay on the "For You" page, which is curated by an AI-driven recommendation algorithm based on user profiles, location, and activity [Zawacki et al., 2022; Smith, 2021]. This feed offers diverse video recommendations, including those with few views, allowing visibility for all posts regardless of follower count. Unlike Facebook or Instagram, TikTok's algorithm significantly influences content visibility [Vázquez-Herrero et al., 2020]. Users reportedly spend about 69% of their time on the "For You" page, making it the primary source for discovering new content [Stokel-Walker, 2020].

In contrast, the “Following” feed exclusively showcases videos from accounts that a user follows, although these may also appear on the “For You” page. Users can also access content through a creator’s profile or by searching specific video hashtags or sounds. While TikTok has not publicly shared details about the workings of its AI recommendation algorithm, independent analyses indicate that higher engagement, such as likes, comments, and shares, significantly increases the likelihood of a video being promoted on the “For You” page [Zawacki et al., 2022]. According to Vázquez-Herrero et al. [2020], the use of hashtags is also essential “to classify the content and participate in challenges and trends, on a platform on which engagement [Larsson, 2018] occurs through less-demanding (likes, shares) and more-demanding forms (comments, duets, lip-syncs) and it is also reflected in followers, views and content circulation” (p. 1721). Moreover, Fang et al. [2019] highlights how the recommendation algorithm contributes to a dynamic of agile consumption, resulting in what is referred to as the “anaesthetic effect” [Fang et al., 2019, p. 348], which enables users to engage in prolonged periods of consumption, driven by their curiosity, often without realising they are doing so.

In summary, the platform stands out for several key features: its engaging short videos, which utilise a concise and dynamic format to capture attention quickly; a customised algorithm with a sophisticated recommendation system that enhances content visibility; the facilitation of viral trends through challenges and popular topics that encourage widespread participation; and a focus on interactivity that simplifies content creation and user engagement on the platform [Smith, 2021].

This unique combination of features, notably the innovative algorithm [Kumar, 2022; Smith, 2021], has propelled the platform to become one of the most popular and widely followed social media networks [DataReportal, 2025; Statista, 2023]. Its versatility accommodates diverse content, including journalism, politics, and science. Journalists leverage the platform for rapid news updates and exclusive behind-the-scenes footage [e.g. García-Ortega & García-Avilés, 2023; Peterson-Salahuddin, 2023; Newman, 2022; Vázquez-Herrero et al., 2020], while politicians use it to engage with younger audiences and enhance their campaigning efforts [e.g. Situmorang & Ritonga, 2025; Cervi et al., 2023; Battista, 2023; Herrman, 2020]. Scientists, on the other hand, employ the platform to connect with the public and share their research in accessible and engaging formats [e.g. Nguyen & Diederich, 2023; Rein, 2023; Radin & Light, 2022; Zawacki et al., 2022; Bautista & Vite León, 2022; J. Zeng et al., 2020].

Focusing on science, the central theme of this investigation, J. Zeng et al. [2020] highlight that the platform has seen a significant rise in science-related content, particularly since 2019. “As of April 2020, the #scienceiscool and #scienceismagic hashtags have accumulated 4 billion views on the platform. From chemistry experiments to fun facts, science-themed content is being turned into memes. Recently, TikTok has also collaborated with scientists to launch #scienceathome and #learnonTikTok to promote the platform’s educational impacts [Thoensen, 2020] ” [J. Zeng et al., 2020, p. 3217]. It’s important to note that TikTok is not solely used by individuals; it has increasingly become a platform for scientific organisations, starting with universities. This trend is highlighted in the research by Sidorenko Bautista et al. [2021].

Moreover, research indicates that TikTok enables non-expert users to engage in scientific discussions, such as those surrounding climate change, which are typically dominated by

expert scientists and journalists [Basch et al., 2022; Zawacki et al., 2022]. How science content is presented on TikTok, whether in a lecture format or through demonstration, also affects user engagement. Habibi and Salim [2021] assessed the interaction levels of lecture-style versus experimental educational science videos from a TikTok account focused on biology and found that dynamic presentations of scientific experiments garnered the highest engagement [Zawacki et al., 2022].

2.3 ▪ *Challenges surrounding the accuracy and credibility of scientific dissemination on social media: the case of TikTok*

TikTok's impact on scientific communication has surged, particularly during the pandemic [Radin & Light, 2022; J. Zeng et al., 2020]. As lockdowns prompted many to stay home, people turned to social media, leading to the meteoric rise of TikTok's short-form videos [Li et al., 2021; Kale, 2020]. This shift gave scientists and science communicators an extraordinary opportunity to connect with a vast new audience that traditional methods may have overlooked. Through its unique algorithm, TikTok exposed users to diverse content, including educational material, making science more accessible to younger generations and beyond.

The platform's engaging format, which often incorporates popular trends, music, and visual effects, has made complex scientific ideas easier to digest and relate to. This approach allowed scientists to present themselves as approachable figures, bridging the gap between the scientific community and the general public. During the pandemic, the demand for accurate, evidence-based information was crucial. Organisations like the World Health Organisation even collaborated with TikTok to disseminate credible health information and combat the spread of misinformation [TikTok, 2020]. Scientists and public health experts leveraged the platform to share reliable data and promptly address common questions and concerns about COVID-19 [Hutchinson, 2020].

Ultimately, the pandemic accelerated an already growing trend, solidifying TikTok's role as a powerful medium for swiftly and effectively sharing scientific knowledge in an engaging and comprehensible manner. While the pandemic marked a significant rise in TikTok as a platform for scientific communication, it simultaneously heightened "the role of social media in spreading information and disinformation alike" [Radin & Light, 2022, p. 1]. In this article, we are particularly interested in highlighting how TikTok has played a substantial role in the spread of misinformation, as it has been highlighted during the COVID-19 pandemic by Patel and Thakur [2024]. However, our study will not focus on the particular case of COVID-19 misinformation, but on scientific information in general. Moreover, the focus of our work is to assess the extent to which science content on TikTok adheres to established scientific principles and avoids the spread of misinformation.

Research indicates that while misinformation on TikTok is viewed less frequently, it engages viewers more effectively [Baghdadi et al., 2023]. COVID-19-related videos often combine health information, humour, and elements of fear or empathy [Southwick et al., 2021]. Notably, videos discouraging vaccination, frequently using parody, received significant engagement despite being less prevalent than pro-vaccine content [Basch et al., 2021]. With adolescents comprising over 60% of TikTok users, concerns arise about their exposure to misleading information [Baumel et al., 2021]. Although the volume of COVID-19 misinformation has decreased, misleading vaccine content persists, with more videos against

vaccination than in favour [Basch et al., 2021]. The platform's rapid video dissemination also aids the spread of misinformation regarding mask effectiveness [Baumel et al., 2021].

These examples illustrate how TikTok was utilised during the pandemic to propagate misinformation. They serve as crucial touchpoints in our research, enabling us to explore the complexities surrounding the accuracy and credibility of scientific dissemination on social media, particularly emphasising the role of TikTok. The credibility of scientific dissemination on social media faces numerous challenges that can significantly impact public understanding and response to critical issues. One primary concern is the prevalence of misinformation and disinformation, which can easily spread due to the viral nature of these platforms [S. Chen et al., 2023]. Users frequently face misleading information that can overshadow reliable sources. Algorithms prioritise engagement over accuracy, making it harder for verified scientific information to reach audiences. Social media's structure often promotes sensationalism, where dramatic headlines overpower nuanced discourse [S. Chen et al., 2023].

Another challenge lies in the varying levels of scientific literacy among social media users. Many individuals may lack the background knowledge necessary to critically evaluate the information they encounter, leading them to accept unverified claims as fact [Howell & Brossard, 2021]. The democratisation of content creation enables anyone to claim expertise, blurring the lines between credible science and untested ideas. Social media's fast pace also favours bite-sized content over detailed analysis, leading to oversimplifying complex issues.

Scientific findings must be grounded in evidence, regardless of the communication platform used [Schäfer, 2021]. The COVID-19 pandemic and its accompanying "infodemic" [World Health Organization, 2020] have underscored the necessity for clear communication on critical issues such as COVID-19 transmission, climate change, and healthcare. The public expects researchers to engage in these discussions, highlighting the importance of making scientific knowledge accessible. There has been a global push from political entities, stakeholders, and scientific organisations for improved science communication, resulting in diverse formats like public lectures, workshops, and social media updates. These initiatives emphasise the importance of scientific evidence for decision-making, advocating for the wide dissemination of knowledge derived from scientific inquiry [Schäfer, 2021].

The field of science communication has uncovered relevant insights. Research indicates that an increasing number of scientists are willing to share their findings, highlighting various communication models with distinct strengths and weaknesses [Schäfer, 2021]. However, a challenge persists: many scientists still see knowledge transfer as a one-way process, mainly focused on explaining concepts to non-experts. This approach overlooks the diverse audiences that science communication must engage, each with unique objectives and messaging [Schäfer, 2021]. The urgency of this issue is heightened in today's digital landscape, where social and mobile media personalise communication methods, undermine traditional media structures, and challenge established public communication infrastructures. Addressing these complexities is essential for more effective science communication in our increasingly interconnected world.

Concerns about the accuracy of science reporting have a long history [Hansen, 2016]. While studies on this topic gained prominence in the 1970s and 1980s, interest waned in the 1990s and early 2000s. However, since the early 2000s, there has been a renewed focus on the importance of accuracy in science communication, emphasising its role in public

understanding and trust in science [Hansen, 2016]. “The renewed interest seen in this century in questions about impartiality, accuracy and objectivity in science communication can be understood then in large part as a consequence of the increasing challenges to boundary-setting around public debate caused by the proliferation and widening accessibility of public arenas” [Hansen, 2016, p. 762]. According to the author, “traditional trusted sources/media of information and traditional science journalism (adhering to traditional professional journalistic values re accuracy, source-checking, objectivity, impartiality, etc.) have increasingly been complemented with, and in some cases super-seded by, a diverse multitude of providers of information” [Hansen, 2016, p. 762].

The role of new information providers, especially on social media, is crucial in communicating scientific concepts. Research indicates that 73% of content on platforms like TikTok is inaccurate or overly generalised [Aragon-Guevara et al., 2025], yet it receives similar engagement as accurate information. This trend highlights a significant challenge in distinguishing reliable science from misinformation in health-related social media content [Aragon-Guevara et al., 2025; K. Chen et al., 2022; Xue et al., 2022; Fraticelli et al., 2021; Kong et al., 2021a, 2021b; Hansen, 2016].

In another study, M. Zeng et al. [2025] examined nutrition-related content on TikTok through a multifaceted approach. They focused on understanding common nutrition topics and types of content creators, as well as the quality and accuracy of the information based on evidence, besides engagement metrics like likes, comments, and shares. The findings revealed that TikTok prioritises engagement over accuracy, posing a significant risk by exposing adolescents to potentially harmful nutrition misinformation [M. Zeng et al., 2025]. The same happens in research about ADHD on TikTok. The investigation revealed that over half of the claims presented in these videos were not scientifically accurate [Ninan, 2025].

This trend underscores the urgent need to address science communication dynamics in digital spaces, particularly on TikTok. The current investigation assesses how well science content on the platform adheres to established scientific principles and mitigates misinformation. Given TikTok’s influence and the prevalence of inaccuracies, evaluating the alignment of its content with credible scientific standards is crucial. This research aims to provide insights into the reliability of scientific communication on TikTok and its implications for public understanding of science.

3 ▪ Methods

Our research employs a mixed-methods approach, which combines quantitative and qualitative methodologies [Almeida, 2018], to investigate the accuracy of informal science communication on TikTok, based on two methods: content analysis and quantitative data scraping from TikTok [Barbera et al., 2023]. Our primary focus will be on content created by popular science communication creators in English (Anglophone speakers only, without country restriction), defined as accounts with a significant following (e.g., over 100K followers) and a consistent history of posting science-related videos. A purposive sampling strategy will select a diverse group of such creators, ensuring representation across various scientific disciplines within the natural sciences (e.g., biology, physics, chemistry, astronomy, etc.). After searching accounts that either contained the words “Science” or other related words (i.e. “STEM”, engineering, biology, etc.), we were able to select more than 100 accounts. We then

eliminated all accounts not represented by an identifiable person or group of people (e.g., @Discovery, @5.min.science, @medical_science8, etc.), even though their accounts fulfilled the specifics mentioned above. We also discarded accounts in which the owner(s) had more videos on other topics than science in the last 20 posted items (e.g. Bill Nye, Drdre4000, etc.), or accounts reposting old videos instead of uploading new content in the previous 6 months. These selection criteria, proposed by the authors, allowed the study to be based on a feasible and attainable sample. This data collection on TikTok was conducted from June 1, 2025, to June 9, 2025, with the last 10 videos of each of the 21 accounts being assessed by both authors between 8 and 9 June 2025 (see supplementary material).

After selecting the final accounts, we used a data scraping tool to retrieve the data from the app [Barbera et al., 2023]. In this particular case, we used Apify, using two different actors, "TikTok Scraper" and "TikTok Comments Scraper", to obtain the desired information. From each selected creator (N=21), we selected a sample of their most recently posted videos (e.g., last 10 videos posted, excluding pinned posts) and collected them for in-depth content analysis. We also developed a framework in Table 1, to assess the accuracy of the scientific claims presented in each video, following the works of Olesk et al. [2021] and Taddicken et al. [2024]. This framework includes the following criteria:

Table 1. A framework to evaluate the scientific value and accuracy of the videos.

	Inexistent / Can't be assessed (=0) **Existent / Can be assessed (=1)**
Adherence to Established Scientific Principles (AESP)	Scientific soundness and rigour (The source must be based on the scientific method, and concepts must align with established knowledge) [Olesk et al., 2021]. Factual accuracy (The information presented must be truthful, objective, and consistent with the scientific evidence) [Olesk et al., 2021]. Correctness (The explicit focus on the content being correct is a foundational criterion) [Olesk et al., 2021].
Evidence-Based Claims (EBC)	Are the claims made in the video supported by evidence, data, or references to credible sources that are cited, referenced, or mentioned in the video/caption/description? (Inexistent / can't be assessed).
Cross-referenced Information (CRI)	Balance (The content should cover all major aspects of an issue, including input from different experts and stakeholders) [Olesk et al., 2021]. Nuance / Critique / Contextualisation (The communication must be critical and contextualised, acknowledging limitations and research frontiers) [Taddicken et al., 2024]. Transparency of limitations and methods (Nuance is often achieved by being transparent about what is not known or how the results were achieved) [Olesk et al., 2021]. Plurality and balanced reporting (The necessity of representing multiple viewpoints to achieve objective communication) [Taddicken et al., 2024].

We implemented the assessment criteria by translating the theoretical quality indicators from Olesk et al. [2021] and Taddicken et al. [2024] into a multi-layered verification process for each TikTok video. For instance, the assessment (see supplementary material) of a TikTok video demonstrating instantaneous water freezing (supercooling) provides a strong example of how content can be factually accurate yet lack scientific rigour. The video, which typically shows a bottle of purified water instantly crystallizing upon impact or when poured onto ice, scores 1 (=existent/can be assessed) on "Factual Accuracy and Correctness", because the phenomenon, supercooling, is a genuine physical process where pure water can be cooled

below 0°C without freezing, only solidifying upon nucleation. However, the video often scores 0 (=inexistent/can't be assessed) on "Scientific Soundness and Rigour". While the underlying physics aligns with established thermodynamics, the video often fails the scientific method by presenting the trick as "magic" or a simple, guaranteed outcome without explaining the essential prerequisites (e.g., highly purified water, undisturbed state, exact temperature range). Crucially, it scores low on "Transparency of Limitations and Methods" as it rarely provides the necessary nuance: it omits the methodological details of achieving purification and precise temperature control, and fails to mention the limitations (e.g., supercooling is difficult to achieve with tap water, and the effect is only momentary). This lack of transparency prioritizes a dramatic effect over complete scientific explanation. While the video explains the *science* (the "why"), the short TikTok format often compromises nuance by simplifying the precise methodological challenges and omitting the limitations (how easily the experiment fails). Thus, the content is scientifically robust but slightly reduced in methodological transparency for the sake of dramatic, engaging communication. Additionally, the videos that could not be assessed, whether they are not presenting any scientific information (e.g. influencer talking about their day-to-day life or other non-scientific topic), were marked N/A (see supplementary material).

In addition to the framework presented above, our study also explores factors that may influence the accuracy of science content. This will involve the following topics:

- Account statistics: followers and likes, type of scientific content and basic account information.
- Creator's Background: publicly available information about the creators' educational background, professional affiliations, and previous experience in science communication.

4 ▪ Results

We start our results section with the final selection of content creators, presented in Table 2.

As explained in the methods section, we selected 21 profiles from the previous batch. This list comprises different profiles from different backgrounds, with different audiences, ranging from as low as 260k followers to as high as 10,7 million followers and focusing on scientific topics ranging from Astronomy to Palaeontology, Physics, Engineering, Chemistry and Biology. Most creators also approach other issues indirectly related to their primary focus, and were therefore marked as "Others", on top of their primary discipline of focus.

The creators, for the most part, have professional backgrounds and/or studies in the field in which they communicate on TikTok. However, most have never published scientific or academic works, which is understandable, since many do not or have never worked in academia or research laboratories. Nevertheless, this is essential information regarding the next part of our assessment, based on the content created by these TikTokers. As previously mentioned, one of the selection criteria was that all creators were Anglophone speakers. As we can observe in Table 3, more than two-thirds of the final list consists of United States of America citizens, with Canada and Australia following in second place, and one creator is from Israel. It is worth mentioning that one of the U.S.A. creators is currently based in England.

Table 2. Creator's descriptions and TikTok statistics.

Account Name	Person behind the Account	Country of origin*	TikTok Stats	Science / Type
@AstroAlexandra	Alexandra Doten	U.S.A.	Followers: 782.2 K Likes: 6.8 M	Astronomy
@Astroathens	Athena Brensberger	U.S.A.	Followers: 260.6 K Likes: 1.7 M	Astronomy
@Astrokirsten	Kirsten Banks	Australia	Followers: 476.8 K Likes: 12.2 M	Astronomy / Astrophysics / Others
@AstroKobi	Kobi Brown	Australia	Followers: 2.9 M Likes: 135.6 M	Astronomy
@ChemTeacherPhil	Phil Cook	U.S.A.	Followers: 3.8 M Likes: 62.7 M	Chemistry
@Cleoabram	Cleo Abram	U.S.A.	Followers: 1.9 M Likes: 35.3 M	General / Tech / Others
@Coolchemistryguy	Guy Rabi	Israel	Followers: 1.9 M Likes: 35.3 M	Chemistry / Others
@Dr.cal.ur.science.pal	Dr. Cal / Unknown	U.S.A. (currently residing in England)	Followers: 465 K Likes: 6 M	DNA Specialist / Chemistry / Others
@Drkyleo	Kyle Osbourne	U.S.A.	Followers: 742 K Likes: 21.6 M	Psychology
@dr.noc	Morgan McSweeney	U.S.A.	Followers: 1.9 M Likes: 34.5 M	Medical / Others
@Evanthorizon	Evan Thorizon	U.S.A.	Followers: 2.7 M Likes: 49.1 M	Physics
@instituteofhumananatomy	Jeremy Jones & Jonathan Bennion	U.S.A.	Followers: 10.7 M Likes: 114.8 M	Anatomy / Biology / Others
@jayprehistoricpets	Jay Brewer	U.S.A.	Followers: 21.1 M Likes: 303.8 M	Palaeontology / Biology / Others
@MarkRober	Mark Rober	U.S.A.	Followers: 3.7 M Likes: 49.8 M	Physics / Engineering / Others
@NileRed	Nigel Braun	Canada	Followers: 10.6 M Likes: 226.4 M	Chemistry / Others
@neildegrassetyson	Neil deGrasse Tyson	U.S.A.	Followers: 5.8 M Likes: 70.6 M	Astronomy / Others
@stevespanglerr	Steve Spangler	U.S.A.	Followers: 1.6 M Likes: 27.8 M	Physics / STEM / Others
@techience	Ben MacAdam	U.S.A.	Followers: 543.7 K Likes: 5.9 M	Chemistry / Others
@Tiscience	Harini Bhat	U.S.A.	Followers: 1.1 M Likes: 34.1 M	Medical / Others
@ThePhysicsHouse	Anthony Rajkovich & Ryan Curtis	Canada	Followers: 647 K Likes: 19.9 M	Physics / Others
@ZekeDarwinScience	Issac Russell	U.S.A.	Followers: 789 K Likes: 29 M	Biology / Evolution / Others

Table 3. Scientific background and degrees of content creators (*country of origin may differ from current living location).

Account Name	Person behind the Account	Scientific background and degree (if applicable)	Owns scientific degree in the area of focus / currently studying in the area of focus	Has published academic / scientific papers / Books / Book chapters
@AstroAlexandra	Alexandra Doten	Former space communications specialist with NASA and later the U.S. Space Force. Bachelor of Science in Human and Organizational Development specializing in Leadership and Organizational Effectiveness	Yes	No
@Astroathens	Athena Brensberger	Majored in Physics (College of Staten Island) but abandoned	No	No
@Astrokirsten	Kirsten Banks	UNSW's Scientia PhD program, focus on stellar astrophysics	Yes	Yes
@AstroKobi	Kobi Brown	Degrees in Physics, Astrophysics, and Applied Mathematics	Yes	No
@ChemTeacherPhil	Phil Cook	Bachelor of Science in Chemistry Education from Purdue University and a Master of Science in Education from Purdue University	Yes	No
@Cleoabram	Cleo Abram	Political science studies at Columbia University	No	No
@Coolchemistryguy	Guy Rabi	Medical studies (university unknown)	Yes	No
@Dr.cal.ur.science.pal	Unknown name	Graduate student (unknown major / unknown university)	Yes	No evidence
@Drkyleo	Kyle Osbourne	Doctorate of Psychology and Master of Sciences in clinical psychology from Philadelphia College of Osteopathic Medicine in Philadelphia, PA	Yes	Yes
@dr.noc	Morgan McSweeney	PhD in pharmaceutical sciences and immunology	Yes	Yes
@Evanthorizon	Evan Guerrero	Bachelor's degree in astrophysics from West Texas A&M University	Yes	No
@instituteofhumananatomy	Jeremy Jones and Jonathan Bennion	**Jeremy Jones**: BS from the University of Utah and an MBA from Brigham Young University. **Jonathan Bennion**: Degree in Health Promotion and Education at the University of Utah, Master of Physician Assistant degree, and works as a medical provider in urgent care	Yes	No (JJ) / Yes (JB)
@jayprehistoricpets	Jay Brewer	No evidence	No	No
@MarkRober	Mark Rober	Bachelor of Science in Mechanical Engineering from Brigham Young University and a Master of Science in Mechanical Engineering from the University of Southern California	Yes	Yes
@NileRed	Nigel Braun	Bachelor of Science (BSc) degree in Biochemistry with a minor in Pharmacology, McGill University	Yes	No evidence
@neildegrassetyson	Neil deGrasse Tyson	Bachelor of Arts in Physics from Harvard University, Master of Arts in Astronomy from the University of Texas at Austin, Master of Philosophy in Astrophysics from Columbia University, PhD in Astrophysics from Columbia University	Yes	Yes
@stevespanglerr	Steve Spangler	Dual bachelor's degree in chemistry and humanities from the University of Colorado Boulder	Yes	Yes
@techience	Ben MacAdam	Chemistry degree from Clarkson University	Yes	No
@Tiscience	Harini Bhat	PharmD, University of California	Yes	No
@ThePhysicsHouse	Anthony Rajkovich and Ryan Curtis	Currently studying Physics at the University of British Columbia	Yes	No
@ZekeDarwinScience	Issac Russell	Former 8th grade science teacher	Yes	No

We will now examine the data obtained from the scraping tools by assessing each account's last 10 videos (excluding ads, partnerships, sponsorships, and pinned videos). The complete assessment of each content creator's last 10 videos (excluding pinned videos) is presented in the supplementary material. A majority of the videos do not credit verifiable sources, which not only puts all the viewers' trust in the content creator but also leaves viewers with their own devices to search for the information, which can lead them to other unreliable sources of information and potentially create more misinterpretation or misinformation on the theories discussed. Moreover, some of the creators mention "scientists" in their videos, such as "scientists believe that this is due to X", which is also misleading and potentially harmful for viewers who are left with no sources, no cited studies or data reports to verify the information, and a lack of direct information on the person or people behind the studies at the centre of the topics discussed in the videos. In addition, most videos use a fair amount of studies, datasets, and images that are not credited or given enough context as if it was created by the author of the TikTok, or simply obtained on the web. This is also consistent with the fact that a majority of the creators, as we previously mentioned, have never published any academic or scientific work or study of their own, meaning that this lack of transparency and knowledge of how to cite correctly and credit other researchers' work could be explained by that. However, since many creators refer to themselves as "researchers" and "scientists" in their profiles and videos, this lack of transparency is detrimental to communicating science online, undermines the scientific value of the content and creates several detrimental outcomes. By failing to provide verifiable sources, the content places the entire burden of trust solely on the content creator. Viewers are then left with their own devices to potentially search for further information, which may lead them to other unreliable sources and potentially cause further disinformation or misrepresentation of the data discussed in the video. Moreover, in many other cases, viewers might trust the creator as the only reliable source without cross-checking the presented information, and re-use the same intel in their own work, content, or in other professional and personal settings.

Furthermore, since many creators use vague or misleading attributions, calling themselves and their sources "scientists" or "researchers", viewers are provided with no clear source of information to rely upon and search further, and not possible to verify the source in question. Another major issue obtained in the results of our study is linked to the absence of credits for visuals and datasets shown in the videos. The findings show a general lack of adherence to scientific principles across the analysed accounts, as a majority of them do not credit the images used, the graphics and tables, and even when showing the title page of a scientific article they provide as their source, do not credit the authors of the article sufficiently for viewers to be able to find the article online. These findings concur with those of other authors [Aragon-Guevara et al., 2025; M. Zeng et al., 2025; K. Chen et al., 2022; Xue et al., 2022; Fraticelli et al., 2021; Kong et al., 2021a, 2021b], which suggests that scientific content on social media often tends to be inaccurate or overly generalised, even when produced by accounts with significant follower counts. As our findings reveal, most creators of our sample have professional backgrounds or studies in the scientific fields they communicate about. However, most have never published scientific or academic works. This lack of publishing experience could explain the deficit in knowledge regarding proper citation and crediting of other researchers' work. However, this lack of transparency, combined with poor to nonexistent crediting and referencing of other researchers' work, is highly detrimental to communicating science online, and seems irresponsible for creators with such a following.

In sum, we understand that the format of TikTok video is already a constraint in the amount of information that the creators can disclose, yet the data itself, if not verifiable, is the creators' responsibility. Therefore, many videos do not even credit the images used, nor mention whether they are used during the video itself or in the caption/video description, which shows a lack of transparency and general disdain for the work of other scientists and the broader scientific community. Moreover, by letting the public guess where the information originates, the creators are also responsible for not assisting their audience to deepen their knowledge based on a 30 to 60-second clip, which cannot suffice as a full dive into any scientific concept. Therefore, creators who are themselves scientists, students, professionals, or *aficionados* must consider their audience's impressionability and the lack of literacy they are responsible for [Howell & Brossard, 2021; Hilary & Dumebi, 2021; Shu et al., 2020]. Another critical factor is how these content creators use their platforms to promote paid ads, partnerships and sponsorships. Our analysis skipped all such videos from the data collection. However, the presence of such videos is referenced in the table (see supplementary material), and clearly shows a potential for biased videos, where, although marked as such, the viewer is left wondering if the content is accurate or just a way to attract consumers [Schäfer, 2021; Hansen, 2016].

Lastly, while we cannot extrapolate any of the results obtained from our data, we can suggest that although videos need to be swift and fun, adding the necessary information (whether information sources or image sources) in the description box, or as tags in the videos, could be a great way to improve the transparency of the information provided, without hindering the aesthetic quality of the content. Moreover, the many images used in the videos should also be better contextualised, when of the authorship of the creators, or properly credited when obtained from third parties, even if they do not infringe any copyright, as the intent here is to give transparency and as much information to the public, for the audiences to be able to further their research. Finally, these science communicators' profiles, knowledge, and expertise would not be such an issue if all TikTok science creators were more transparent about their credentials, as some are, and more scientific in their approach to creating content.

We therefore recommend that creators enhance transparency in their videos by providing several sources of information, rather than one study or other creator as their only source of information, and providing all this intel in the description box of their video or as a pinned comment, thus providing the information without compromising the "entertainment value" of the video. We also recommend that images, graphics, datasets, and other third-party information be appropriately credited and contextualised within the video. Our last recommendation is directed to TikTok. Many of these inaccuracies and misrepresentations could be avoided by a platform change, providing creators with clear guidelines and policies to follow on how to use third-party information and scientific results. Moreover, the platform which directly profits from such content needs to implement more mechanisms, such as collaborations with external fact-checking organisations, to improve on this point.

5 ▪ Conclusions

This paper provides valuable insights into the landscape of informal science communication on TikTok, suggesting that while the platform offers significant opportunities for science outreach, it may also present considerable challenges regarding content accuracy [M. Zeng et al., 2025; Aragon-Guevara et al., 2025; Ninan, 2025; K. Chen et al., 2022; Xue et al., 2022;

Schäfer, 2021; Fraticelli et al., 2021; Kong et al., 2021a, 2021b; Hansen, 2016]. Our findings suggest the dichotomy of TikTok as a source of scientific information: a space where dedicated creators may effectively disseminate accurate knowledge and, concurrently, a channel where misinformation appears to be able to spread. As suggested in our results section, this might be related to the observation that a majority of these science influencers do not appear to have prior experience in peer-reviewed scientific publishing on their own, and could therefore lack the experience needed to provide verifiable sources and proper citations, whether they use images, datasets, or even actual peer-reviewed studies.

Our findings appear to align with those of previous studies [Aragon-Guevara et al., 2025; M. Zeng et al., 2025; K. Chen et al., 2022; Xue et al., 2022; Fraticelli et al., 2021; Kong et al., 2021a, 2021b], suggesting that the accounts we analysed often present content labelled as scientific, which may be inaccurate or overly generalised, despite having a significant number of followers. Furthermore, within the framework developed in our study, the results suggest a prevalence of limited adherence to scientific principles. A majority of the statements presented in these accounts do not appear to be substantiated by scientific evidence, and users are often not afforded the opportunity to verify the claims made, as no sources are provided for cross-referencing the information presented.

In this context, it is important to note that TikTok's short-video format naturally aligns with the communication style of many topics in the natural sciences. Subjects that are visual, factual, and offer practical tips tend to engage viewers more effectively. In contrast, the complexities and nuances inherent in many social science topics make them more difficult to communicate. These subjects often require deep context to avoid ideological misrepresentation, which can hinder their effectiveness and reduce the likelihood of going viral. As a result, rigorous discussions in social science may struggle to achieve the same reach and engagement on the platform.

Based on our findings, we proposed several recommendations to enhance the accuracy of TikTok's science content. We suggest it would be beneficial for content creators to develop clear guidelines for scientific accuracy, including the consistent citation of sources and the transparent declaration of potential biases [Schäfer, 2021; Hansen, 2016]. However, rather than relying solely on content creators to make these changes, we believe this presents a valuable opportunity for platform reformation, urging TikTok to consider implementing more robust mechanisms for identifying and flagging misinformation, potentially through partnerships with scientific fact-checking organisations and international institutions [World Health Organization, 2024].

Finally, we understand that strategies for promoting scientific literacy among viewers are crucial. Such efforts should involve educational initiatives within the app to encourage users to question sources, seek corroborating evidence, and understand the scientific process. We would like to reflect on a few additional points as we conclude this study. Firstly, as mentioned previously, we cannot label science communication on TikTok as "bad" or "harmful". Yet, our results may indicate a possible lack of transparency, credits, and miscommunication that we believe warrants attention. On the other hand, we believe that TikTok could become an even more effective platform for science communication if the previously mentioned topics are addressed, since we have also witnessed the ability for specific creators to use the platform to dissect and deconstruct misinformation spread on other platforms or by other users. As we saw with the cases of Dr. Noc or Dr. Harini Baht,

these approaches are possible. They can be further improved by providing several sources of verification, in addition to the creator's commentary on such topics. Finally, even if, as approached during our literature review, Scientists on such platforms tend to be less trusted by the public, it it appears essential for all creators of scientific content, whether scientists or not, to respect the works, studies, data report and images of other scientists and researchers who have contributed to the content that they are using as their own. We also believe that a deeper assessment of these contents, such as the data obtained from comment sections, and a broader approach to the sample, is needed. Therefore, we suggest that further research on this topic and other methods, including comparisons with other studies, could provide a better understanding of what can be done to improve science communication on TikTok.

5.1 ▪ *Limitations of the study*

As with all empirical research, this study has limitations that are important to consider when interpreting its findings. One such constraint is the short, fixed sampling window, which means that the results only represent a snapshot of content during a specific time period.

Additionally, focusing exclusively on English-speaking creators may limit the generalisability of the findings to global science communication practices on TikTok. Furthermore, the decision to analyse a maximum of ten videos per account restricts the depth of understanding regarding any single creator's output.

Lastly, while a highly structured and detailed assessment rubric was employed, the absence of a formal inter-coder reliability test (such as Cohen's κ or Krippendorff's α) should be acknowledged as a methodological limitation and warrants careful interpretation of the coded data

References

Allgaier, J. (2018). Science and medicine on YouTube. In J. Hunsinger, L. Klastrup, M. M. Allen & M. Mathew (Eds.), *Second international handbook of internet research* (pp. 1–21). Springer Netherlands. https://doi.org/10.1007/978-94-024-1202-4_1-1

Allgaier, J. (2019). Science and environmental communication on YouTube: strategically distorted communications in online videos on climate change and climate engineering. *Frontiers in Communication*, *4*, 36. https://doi.org/10.3389/fcomm.2019.00036

Almeida, F. L. (2018). Strategies to perform a mixed methods study. *European Journal of Education Studies*, *5*, 137–151. https://doi.org/10.5281/zenodo.1406214

Aragon-Guevara, D., Castle, G., Sheridan, E., & Vivanti, G. (2025). The reach and accuracy of information on autism on TikTok. *Journal of Autism and Developmental Disorders*, *55*, 1953–1958. https://doi.org/10.1007/s10803-023-06084-6

Arriagada, A., & Ibáñez, F. (2020). "You need at least one picture daily, if not, you're dead": content creators and platform evolution in the social media ecology. *Social Media + Society*, *6*. https://doi.org/10.1177/2056305120944624

Baghdadi, J. D., Coffey, K. C., Belcher, R., Frisbie, J., Hassan, N., Sim, D., & Malik, R. D. (2023). #Coronavirus on TikTok: user engagement with misinformation as a potential threat to public health behavior. *JAMIA Open*, *6*. https://doi.org/10.1093/jamiaopen/ooad013

Barbera, G., Araujo, L., & Fernandes, S. (2023). The value of web data scraping: an application to TripAdvisor. *Big Data and Cognitive Computing*, *7*, 121. https://doi.org/10.3390/bdcc7030121

Basch, C. H., Meleo-Erwin, Z., Fera, J., Jaime, C., & Basch, C. E. (2021). A global pandemic in the time of viral memes: COVID-19 vaccine misinformation and disinformation on TikTok. *Human Vaccines & Immunotherapeutics*, *17*, 2373–2377. https://doi.org/10.1080/21645515.2021.1894896

Basch, C. H., Yalamanchili, B., & Fera, J. (2022). #Climate change on TikTok: a content analysis of videos. *Journal of Community Health*, *47*, 163–167. https://doi.org/10.1007/s10900-021-01031-x

Battista, D. (2023). For better or for worse: politics marries pop culture (TikTok and the 2022 Italian elections). *Society Register*, *7*, 117–142. https://doi.org/10.14746/sr.2023.7.1.06

Baumel, N. M., Spatharakis, J. K., Karitsiotis, S. T., & Sellas, E. I. (2021). Dissemination of mask effectiveness misinformation using TikTok as a medium. *Journal of Adolescent Health*, *68*, 1021–1022. https://doi.org/10.1016/j.jadohealth.2021.01.029

Bautista, K. C., & Vite León, V. O. (2022). Scientific dissemination and TikTok: a systematic review of scientific literature in web of science. *INTED2022 Proceedings*, *1*, 8090–8095. https://doi.org/10.21125/inted.2022.2042

Bell, P., Lewenstein, B. V., Shouse, A. W., & Feder, M. (2009). *Learning science in informal environments: people, places, and pursuits*. The National Academies Press.

Bhargava, P., MacDonald, K., Newton, C., Lin, H., & Pennycook, G. (2023). How effective are TikTok misinformation debunking videos? *Harvard Kennedy School Misinformation Review*. https://doi.org/10.37016/mr-2020-114

Brossard, D. (2013). New media landscapes and the science information consumer. *Proceedings of the National Academy of Sciences*, *110*, 14096–14101. https://doi.org/10.1073/pnas.1212744110

Cervi, L., Tejedor, S., & Blesa, F. G. (2023). TikTok and political communication: the latest frontier of politainment? A case study. *Media and Communication*, *11*. https://doi.org/10.17645/mac.v11i2.6390

Chen, K., Zhou, L., Zhao, R., & Tang, Y. (2022). Assessing the quality of hearing aids-related videos on TikTok. *Frontiers in Public Health*, *10*. https://doi.org/10.3389/fpubh.2022.901976

Chen, S., Xiao, L., & Kumar, A. (2023). Spread of misinformation on social media: what contributes to it and how to combat it. *Computers in Human Behavior*, *141*, 107643. https://doi.org/10.1016/j.chb.2022.107643

Craig, D. (2019). Creator management in the social media entertainment industry. In M. Deuze & M. Prenger (Eds.), *Making media: production, practices and professions* (pp. 363–374). Amsterdam University Press. https://doi.org/10.1017/9789048540150.027

DataReportal. (2025). TikTok users, stats, data, trends and more. *Global Digital Insights*. https://datareportal.com/essential-tiktok-stats

Davies, S. R., & Hara, N. (2017). Public science in a wired world: how online media are shaping science communication. *Science Communication*, *39*, 563–568. https://doi.org/10.1177/1075547017736892

Fähnrich, B., Weitkamp, E., & Kupper, J. F. (2023). Exploring 'quality' in science communication online: expert thoughts on how to assess and promote science communication quality in digital media contexts. *Public Understanding of Science*, *32*, 605–621. https://doi.org/10.1177/09636625221148054

Fang, J., Wang, Z., & Hao, B. (2019). Analysis of "anesthesia" mechanism in mobile short video applications. In T. Striełkowski & J. Cheng (Eds.), *Proceedings of The First International Symposium on Management and Social Sciences (ISMSS 2019)* (pp. 348–351). Atlantis Press. https://doi.org/10.2991/ismss-19.2019.75

Fraticelli, L., Smentek, C., Tardivo, D., Masson, J., Clément, C., Roy, S., Dussart, C., Bourgeois, D., & Carrouel, F. (2021). Characterizing the content related to oral health education on TikTok. *International Journal of Environmental Research and Public Health*, *18*, 13260. https://doi.org/10.3390/ijerph182413260

García-Ortega, A., & García-Avilés, J. A. (2023). Innovation in narrative formats redefines the boundaries of journalistic storytelling: Instagram stories, TikTok and comic journalism. In *Blurring Boundaries of Journalism in Digital Media* (pp. 185–197). Springer International Publishing. https://doi.org/10.1007/978-3-031-43926-1_13

Habibi, S. A., & Salim, L. (2021). Static vs. dynamic methods of delivery for science communication: a critical analysis of user engagement with science on social media (B. Guidi, Ed.). *PLOS ONE*, *16*, e0248507. https://doi.org/10.1371/journal.pone.0248507

Hansen, A. (2016). The changing uses of accuracy in science communication. *Public Understanding of Science*, *25*, 760–774. https://doi.org/10.1177/0963662516636303

Hargittai, E., Füchslin, T., & Schäfer, M. S. (2018). How do young adults engage with science and research on social media? Some preliminary findings and an agenda for future research. *Social Media + Society*, *4*, 1–10. https://doi.org/10.1177/2056305118797720

Herrman, J. (2020). TikTok is shaping politics. But how? *The New Yor Times*. https://www.nytimes.com/2020/06/28/style/tiktok-teen-politics-gen-z.html

Hilary, I. O., & Dumebi, O.-O. (2021). Social media as a tool for misinformation and disinformation management. *Linguistics and Culture Review*, *5*, 496–505. https://doi.org/10.21744/lingcure.v5ns1.1435

Hodson, D. (2020). Going beyond STS education: building a curriculum for sociopolitical activism. *Canadian Journal of Science, Mathematics and Technology Education*, *20*, 592–622. https://doi.org/10.1007/s42330-020-00114-6

Howell, E. L., & Brossard, D. (2021). (Mis)informed about what? What it means to be a science-literate citizen in a digital world. *Proceedings of the National Academy of Sciences*, *118*, e1912436117. https://doi.org/10.1073/pnas.1912436117

Huber, B., Barnidge, M., Gil de Zúñiga, H., & Liu, J. (2019). Fostering public trust in science: the role of social media. *Public Understanding of Science*, *28*, 759–777. https://doi.org/10.1177/0963662519869097

Hutchinson, A. (2020). TikTok partners with World Health Organization on COVID-19 information program. *Social Media Today*. https://www.socialmediatoday.com/news/tiktok-partners-with-world-health-organization-on-covid-19-information-prog/574259/

Kale, S. (2020). How coronavirus helped TikTok find its voice. *The Guardian*. https://www.theguardian.com/technology/2020/apr/26/how-coronavirus-helped-tiktok-find-its-voice

Kirchhoff, D. (2021). More Tok on the Clock: introducing longer videos on TikTok. *TikTok Newsroom*. https://newsroom.tiktok.com/en-us/longer-videos

Kong, W., Song, S., Zhao, Y. C., Zhu, Q., & Sha, L. (2021a). TikTok as a health information source: assessment of the quality of information in diabetes-related videos. *Journal of Medical Internet Research*, *23*, e30409. https://doi.org/10.2196/30409

Kong, W., Song, S., Zhao, Y. C., Zhu, Q., & Sha, L. (2021b). TikTok as a health information source: assessment of the quality of information in diabetes-related videos. *Journal of Medical Internet Research*, *23*, e30409. https://doi.org/10.2196/30409

Kumar, A. (2022). How TikTok changed the social media game with its unique algorithm. *Entrepreneur*. https://www.entrepreneur.com/science-technology/how-tiktoks-unique-algorithm-changed-the-social-media/431804

Larsson, A. O. (2018). The news user on social media: a comparative study of interacting with media organizations on Facebook and Instagram. *Journalism Studies*, *19*, 2225–2242. https://doi.org/10.1080/1461670x.2017.1332957

León, B., & Bourk, M. (2018). *Communicating science and technology through online video*. Routledge.

Li, Y., Guan, M., Hammond, P., & Berrey, L. E. (2021). Communicating COVID-19 information on TikTok: a content analysis of TikTok videos from official accounts featured in the COVID-19 information hub. *Health Education Research*, *36*, 261–271. https://doi.org/10.1093/her/cyab010

Luzon, M. J. (2019). Bridging the gap between experts and publics: the role of multimodality in disseminating research in online videos. *Iberica*, *37*, 167–192. https://zaguan.unizar.es/record/86410/files/texto_completo.pdf

Metag, J. (2021). Tension between visibility and invisibility: science communication in new information environments. *Studies in Communication Sciences*, *21*, 129–144. https://doi.org/10.24434/j.scoms.2021.01.009

Metag, J., Wintterlin, F., & Klinger, K. (2023). Editorial: science communication in the digital age—new actors, environments and practices. *Media and Communication*, *11*, 212–216. https://doi.org/10.17645/mac.v11i1.6905

Mikaere, R. (2024). A new chance for online science communication education and learning through TikTok. *International Journal of Clinical Medical Research*, *2*, 91–93. https://doi.org/10.61466/ijcmr2030005

Montes, M., Wargo, J., Jones-Jang, S. M., Quan, S., Lai, B., & Riobueno-Naylor, A. (2025). Evaluating video-based science communications practices: a systematic review. *JCOM*, *24*, V01. https://doi.org/10.22323/2.24030901

Newman, N. (2022). *How publishers are learning to create and distribute news on TikTok* [Digital news project]. Reuters Institute for the Study of Journalism. https://doi.org/10.60625/risj-gfyx-3v66

Nguyen, H., & Diederich, M. (2023). Facilitating knowledge construction in informal learning: a study of TikTok scientific, educational videos. *Computers & Education*, *205*, 104896. https://doi.org/10.1016/j.compedu.2023.104896

Ninan, R. (2025). Dr. TikTok? The impact of misinformation on mental health self-diagnosis. *The Petrie-Flom Center. Health law policy, biotechnology and bioethics at Harvard Law School*. https://petrieflom.law.harvard.edu/2025/04/02/dr-tiktok-the-impacts-of-misinformation-on-mental-health-self-diagnosis/

Olesk, A., Renser, B., Bell, L., Fornetti, A., Franks, S., Mannino, I., Roche, J., Schmidt, A. L., Schofield, B., Villa, R., & Zollo, F. (2021). Quality indicators for science communication: results from a collaborative concept mapping exercise. *JCOM*, *20*, A06. https://doi.org/10.22323/2.20030206

O'Sullivan, N. J., Nason, G., Manecksha, R. P., & O'Kelly, F. (2022). The unintentional spread of misinformation on 'TikTok'; a paediatric urological perspective. *Journal of Pediatric Urology*, *18*, 371–375. https://doi.org/10.1016/j.jpurol.2022.03.001

Patel, K. A., & Thakur, N. (2024). Dissemination of misinformation about COVID-19 on TikTok: a multimodal analysis. In *HCI International 2024 Posters* (pp. 109–120). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-61966-3_13

Peters, H. P., Dunwoody, S., Allgaier, J., Lo, Y.-Y., & Brossard, D. (2014). Public communication of science 2.0: is the communication of science via the "new media" online a genuine transformation or old wine in new bottles? *EMBO reports*, *15*, 749–753. https://doi.org/10.15252/embr.201438979

Peterson-Salahuddin, C. (2023). News for (me and) you: exploring the reporting practices of citizen journalists on TikTok. *Journalism Studies*, *25*, 1076–1094. https://doi.org/10.1080/1461670x.2023.2293829

Radin, A. G. B., & Light, C. J. (2022). TikTok: an emergent opportunity for teaching and learning science communication online. *Journal of Microbiology & Biology Education*, *23*, e00236-21. https://doi.org/10.1128/jmbe.00236-21

Rein, B. (2023). Making science education more accessible: a case study of TikTok's utility as a science communication tool. *Neuroscience*, *530*, 192–200. https://doi.org/10.1016/j.neuroscience.2023.08.021

Rowan, K. E. (2012). Book review: learning science in informal environments: people, places, and pursuits. *Science Communication*, *34*, 820–822. https://doi.org/10.1177/1075547012464583

Schäfer, M. S. (2017). How changing media structures are affecting science news coverage. In K. H. Jamieson, D. M. Kahan & D. A. Scheufele (Eds.), *Oxford library of psychology: the Oxford handbook on the science of science communication* (pp. 51–57). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780190497620.013.5

Schäfer, M. S. (2021). The science of science communication: what it is and why it matters. In F. Kelesidou & E. Chabrol (Eds.), *A comprehensive guide to science communication* (pp. 6–9). Hindawi Limited. https://royalacademy.dk/wp-content/uploads/2025/04/hindawi-a-comprehensive-guide-to-science-communication.pdf#page=6

Schwartz, Q. (2025). The history of TikTok and where it's going. *GRIN — Influencer Marketing Software*. https://grin.co/blog/the-history-of-tiktok/

Scolere, L., Pruchniewska, U., & Duffy, B. E. (2018). Constructing the platform-specific self-brand: the labor of social media promotion. *Social Media + Society*, *4*, 1–11. https://doi.org/10.1177/2056305118784768

Shu, K., Wang, S., Lee, D., & Liu, H. (2020). Mining disinformation and fake news: concepts, methods and recent advancements. In K. Shu, S. Wang, D. Lee & H. Liu (Eds.), *Disinformation, misinformation and fake news in social media* (pp. 1–19). Springer International Publishing. https://doi.org/10.1007/978-3-030-42699-6_1

Sidorenko Bautista, P., Alonso López, N., & Giacomelli, F. (2021). Espacios de verificación en TikTok. Comunicación y formas narrativas para combatir la desinformación. *Revista Latina de Comunicación Social*, 87–113. https://doi.org/10.4185/rlcs-2021-1522

Situmorang, T. P., & Ritonga, A. D. (2025). TikTok and politics: a bibliometric mapping of research trends. *Studies in Media and Communication*, *13*, 212. https://doi.org/10.11114/smc.v13i3.7616

Smith, B. (2021). How TikTok reads your mind. *The New York Times*. https://www.nytimes.com/2021/12/05/business/media/tiktok-algorithm.html

Southwick, L., Guntuku, S. C., Klinger, E. V., Seltzer, E., McCalpin, H. J., & Merchant, R. M. (2021). Characterizing COVID-19 content posted to TikTok: public sentiment and response during the first phase of the COVID-19 pandemic. *Journal of Adolescent Health*, *69*, 234–241. https://doi.org/10.1016/j.jadohealth.2021.05.010

Statista. (2023). *Gun laws in the United States in 2023, by state* [Table]. Retrieved February 28, 2024, from https://www.statista.com

Stokel-Walker, C. (2020). Inside TikTok's latest big pitch to advertisers with new numbers showing time spent on the app and engagement metrics. *Business Insider*. https://www.businessinsider.com/leaked-tiktok-slides-engagement-time-spent-activity-2020-9

Taddicken, M., Fick, J., & Wicke, N. (2024). Is this good science communication? Construction and validation of a multi-dimensional quality assessment scale from the audience's perspective. *Frontiers in Communication*, *9*. https://doi.org/10.3389/fcomm.2024.1384403

Thoensen, B. (2020). *Investing to help our community #LearnOnTikTok*. https://newsroom.tiktok.com/en-us/investing-to-help-our-community-learn-on-tiktok

TikTok. (2020, March 16). *WHO to livestream on TikTok*. https://newsroom.tiktok.com/en-us/who-to-livestream-on-tiktok

Vázquez-Herrero, J., Negreira-Rey, M.-C., & López-García, X. (2020). Let's dance the news! How the news media are adapting to the logic of TikTok. *Journalism*, *23*, 1717–1735. https://doi.org/10.1177/1464884920969092

Velarde-Camaqui, D., Viehmann, C., Díaz, R., & Valerio-Ureña, G. (2024). Características de los videos que favorecen el engagement de los divulgadores científicos en TikTok. *Revista Latina de Comunicación Social*, 1–18. https://doi.org/10.4185/rlcs-2024-2232

World Health Organization. (2020, September 23). *Managing the COVID-19 infodemic: promoting healthy behaviours and mitigating the harm from misinformation and disinformation*. https://www.who.int/news/item/23-09-2020-managing-the-covid-19-infodemic-promoting-healthy-behaviours-and-mitigating-the-harm-from-misinformation-and-disinformation

World Health Organization. (2024, September 26). *WHO and TikTok to collaborate on more science-based information on health and well-being*. https://www.who.int/news/item/26-09-2024-who-and-tiktok-to-collaborate-on-more-science-based-information-on-health-and-well-being

Xue, X., Yang, X., Xu, W., Liu, G., Xie, Y., & Ji, Z. (2022). TikTok as an information hodgepodge: evaluation of the quality and reliability of genitourinary cancers related content. *Frontiers in Oncology*, *12*. https://doi.org/10.3389/fonc.2022.789956

Zawacki, E. E., Bohon, W., Johnson, S., & Charlevoix, D. J. (2022). Exploring TikTok as a promising platform for geoscience communication. *Geoscience Communication*, *5*, 363–380. https://doi.org/10.5194/gc-5-363-2022

Zeng, J., Schäfer, M. S., & Allgaier, J. (2020). Reposting "till Albert Einstein is TikTok famous": the memetic construction of science on TikTok: the memetic construction of science on TikTok. *International Journal of Communication*, *15*, 3216–3247. https://doi.org/10.5167/uzh-205429

Zeng, M., Grgurevic, J., Diyab, R., & Roy, R. (2025). #WhatIEatinaDay: the quality, accuracy and engagement of nutrition content on TikTok. *Nutrients*, *17*, 781. https://doi.org/10.3390/nu17050781

About the authors

Ricardo Morais is an Assistant Professor at the Faculty of Arts and Humanities of the University of Porto. He holds a PhD in Communication Sciences from the University of Beira Interior (UBI). He is a researcher at the Transdisciplinary Culture, Space and Memory Research Centre (CITCEM) and a collaborator of LabCom, a research unit at UBI, and a foreign collaborating member of the Multimundos research group — Interdisciplinary Studies of Contemporary Tensions, at the Federal University of Mato Grosso. He has researched, published, and presented works, articles, and book chapters in different areas of communication, among which journalism stands out, as do political and organisational communication.

rjmorais@letras.up.pt

Clara E. Fernandes holds a PhD in Fashion Design and is a Design Lecturer. Her research publications in books, international journals and participation in international conferences focus on Design Education, Entrepreneurship, Innovation, Sustainability and Communication.

She is a member of the UNIDCOM/IADE research centre and a lecturer at LASALLE, University of the Arts Singapore.

fernandes.clara1@gmail.com

How to cite

Morais, R. and Fernandes, C. E. (2026). 'Scrolling through science: how accurate is science content on TikTok'. *JCOM* 25(02), A03. https://doi.org/10.22323/165520251230163519.

Supplementary material

Available at https://doi.org/10.22323/165520251230163519
Assessment of the last 10 videos from the 21 selected accounts

ISSN 1824-2049. Published by SISSA Medialab. jcom.sissa.it