



The Science, Craft, and Art of Mythbusting

How can myths be busted in science communication? Stefan T. Siegel, researcher at the Institute for Business Education (IWP) at the University of St. Gallen, suggests a threefold approach. He explores how science communicators can effectively deal with questionable beliefs and unfounded claims.

The World Economic Forum acknowledges misinformation as a top global risk¹. Social media and generative artificial intelligence fuel easily spread misinformation and disinformation posing a serious threat to our democracies².

In all domains, facts, myths, and questionable assumptions exist. From an educational psychology perspective, myths can be characterized as common and enduring beliefs, that might seem reasonable initially, yet are contradicted by the current state of research³.

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Stefan T. Siegel



International research increasingly provides empirical evidence that misinformation: a) originates from various causes and sources, b) can harm various stakeholders, c) tends to persist, but at the same time d) can be remedied.⁴

In this guest article I argue that science communication and science communicators can benefit from understanding mythbusting⁵ as a science, a craft, and an art to effectively deal with misinformation in various domains.

The Science(s) of Mythbusting

When it comes to mythbusting, different sciences, including cognitive and educational psychology, help science communicators understand the prevalence, causes, consequences, and persistence of myths as well as prevention and intervention strategies⁶.

Knowledge of the latest findings and evidence-informed tools and strategies for combating misinformation and myths⁷ can help avoid falling into mythbusting pitfalls such as strengthening myths through their over repetition, or focusing only on the facts while neglecting other socio-affective drivers of myths. Helpful methods can be types of prebunking (preemptively addressing potential myths) and debunking (correcting myths and providing sound alternative explanati-

ons).

The Debunking Handbook by Stephan Lewandowsky and others provides science communicators and aspiring mythbusters with a valuable summary of the science of mythbusting.



Science, Arts and Crafts. Graphic: Stefan T. Siegel (Pexels/Pixabay, Unplash/Fabian Bächli, Unsplash/Malcolm Lightbody)

The Craft of Mythbusting

Effective mythbusting in science communication involves more than having sufficient domain-specific knowledge; it also requires building practical skills. Becoming proficient in the craft of mythbusting requires science communicators to a) skillfully use various communication strategies and tools, and b) create well-designed educational materials.

Skillfully Using Communication Strategies and Tools

Science communicators can learn to reach diverse audiences using different formats (e.g., refutation texts, infographics, videos) in a clear, engaging, and even memorable manner. Through (deliberate) practice science communicators can learn to reach various audiences with different formats (e.g., refutation texts, infographics, and videos) in a clear, engaging, and memorable way and to get better at agreeing and disagreeing well in discussions⁸.

Like mastering a craft step by step, effective mythbusters can learn to use various tools and frameworks efficiently to better identify, analyze, and challenge potential myths (e.g., truth sandwich; heuristics for identifying potential myths; educational myths refutation canvases; mythbusting decision tree; ⁹ ¹⁰). Such tools can guide science communicators in systematically addressing potential myths.

Creating Tangible Materials and Engaging Content

Designing visually appealing and accessible (multimedia) materials and content, such as explainer videos, infographics, or podcasts, can support science communicators in mythbusting. These materials, when designed according to quality criteria for educational materials and science communication¹¹, help to capture the primary audience's attention and convey more or less

complex topics¹². Here are some examples of good practice:

- The website [Skeptical Science](#) offers scientifically sound and well-designed materials such as refutations of differing length and levels, videos, cartoons, and infographics on climate science myths.
- [Bildungsmärchen – Pädagogische Mythen entzaubert](#) (Educational Fairytales – Educational Myths Debunked) is a current podcast by researchers at the University of Kassel fighting prevalent myths about teaching and learning.
- The British campaign [Climate Science Breakthrough](#) features comedians in videos breaking down myths about climate science.

The Art of Mythbusting

The art of mythbusting lies in science communicators' ability to, among other things, a) connect with audiences not only on a cognitive but also on an emotional and aesthetic level, and b) constructively deal with various tensions in science communication.

Emotional and Aesthetic Appeal

Successful mythbusting often involves storytelling, humor, and creativity to capture the audience's interest. Balancing factual content with emotional resonance can enhance the impact of the message, making the mythbusting more engaging, impactful, and even entertaining¹³.

Dealing with Tensions

“Science communicators and aspiring mythbusters should all feel encouraged to recognize misinformation as a serious threat to science and our democracies (...)”

Stefan T. Siegel



Mythbusting can be challenging, especially when it involves confronting deeply held beliefs. It requires appreciation, empathy, and authenticity to navigate these conversations without alienating the audience. Schulz von Thun's¹⁴ values and development square, a thinking and communication model, can assist science communicators in managing tensions during mythbusting. For instance:

[A]t the heart of science is an essential balance between two seemingly contradictory attitudes — an openness to new ideas, no matter how bizarre or counterintuitive, and the most ruthlessly sceptical scrutiny of all ideas, old and new¹⁵ (Sagan, 1997, 287).

Concluding Thoughts

In essence, effective mythbusting in science communication is a multifaceted endeavor. By un-

derstanding, for instance, the psychological underpinnings of misinformation, honing the necessary skills, and engaging with different audiences creatively, science communicators can fight myths more effectively and make science more accessible to the general public.

Science communicators and aspiring mythbusters should all feel encouraged to recognize misinformation as a serious threat to science and our democracies¹⁶ and to utilize evidence-informed strategies and tools for mythbusting. Mastering the science, craft, and art of mythbusting has proved itself to be essential in this endeavor.

¹ World Economic Forum (WEF) (2024). Global Risks Report 2024. <https://www.weforum.org/publications/global-risks-report-2024/>

² Ecker, U., Roozenbeek, J., van der Linden, S., Tay, L. Q., Cook, J., Oreskes, N., & Lewandowsky, S. (2024). Misinformation poses a bigger threat to democracy than you might think. *Nature*, 630(8015), 29–32. <https://doi.org/10.1038/d41586-024-01587-3>

³ Siegel, S. T. (2024a). Educational Myths Debunked. Lehrblick – ZHW Uni Regensburg. <https://doi.org/10.5283/ZHW.20240215.EN>

⁴ Lewandowsky, S., et al. (2020). The Debunking Handbook 2020. <https://sks.to/db2020>

⁵ Cobley, P. (2011). Mythbusting. *Language Sciences*, 33(4), 511–516. <https://doi.org/10.1016/j.langsci.2011.04.006>

⁶ Lewandowsky et al. (2020)

⁷ e.g. Kozyreva, A., Lorenz-Spreen, P., Herzog, S.M. et al. Toolbox of individual-level interventions against online misinformation. *Nat Hum Behav* 8, 1044–1052 (2024). <https://doi.org/10.1038/s41562-024-01881-0>

⁸ Siegel, S. T. (2024a). Educational Myths Debunked. Lehrblick – ZHW Uni Regensburg. <https://doi.org/10.5283/ZHW.20240215.EN>

⁹ Lewandowsky et al. (2020)

¹⁰ When to bust, and when not to bust, that is the question – A mythbusting decision tree. Evidence-informed Sustainability Education (EvSusEd). <https://evsused.hypotheses.org/1197>

¹¹ Fährnrich, 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(5), 605–621. <https://doi.org/10.1177/09636625221148054>

¹² Lewandowsky et al. (2020)

¹³ Lewandowsky et al. (2020)

¹⁴ Schulz von Thun, F. (2014). Miteinander reden: 2: Stile, Werte und Persönlichkeitsentwicklung: Differenzielle Psychologie der Kommunikation [Talking to each other: 2: Styles, values and personality development: Differential psychology of communication]. Rowohlt.

¹⁵ Sagan, C. (1997). *The Demon-Haunted World: Science as a Candle in the Dark*. Ballantine.

¹⁶ Ecker, U., Roozenbeek, J., van der Linden, S., Tay, L. Q., Cook, J., Oreskes, N., & Lewandowsky, S. (2024). Misinformation poses a bigger threat to democracy than you might think. *Nature*, 630(8015), 29–32. <https://doi.org/10.1038/d41586-024-01587-3>