

Chapter 12

Evaluating the Impact of Education on Misinformation Suppression: A Stock-and-Flow Simulation Approach

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ABSTRACT

In the digital age, the rapid spread of misinformation via online platforms poses significant challenges because the rising interconnectivity allows false information to circulate quickly and widely. This study proposes a Stock-and-Flow simulation model to evaluate the educational interventions' impact on misinformation, featuring three stocks: Misinformed Individuals, Well-Informed Individuals, and Educational Resources, with various flows governed by rates including the Misinformation Spread, Education Effectiveness, Resource Utilization, Resource Growth, and Decay Rates of both Misinformed and Well-Informed Individuals. The simulation explores how education reduces misinformation and how resource availability affects outcomes. While education can significantly lower misinformation, success depends on resource replenishment and Education Effectiveness Rate. Well-Informed Individuals can help counteract misinformation, underlining the importance of sustained educational efforts. The model provides insights for policymakers to design effective strategies for combating misinformation.

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INTRODUCTION

The fabrication of information, including misinformation, disinformation, false narratives, and propaganda, has been a part of human previous eras since at least the time of ancient Rome. The documented history of fake news and disinformation dates back to 44 BC, when Emperor Octavian launched a propaganda campaign against Mark Antony using brief, defamatory slogans inscribed on coins to damage his rival's reputation (Fisher, 2023). It continued with the Great Moon Hoax of 1835, when the *New York Sun* published six fabricated articles about life on the Moon, falsely attributed to astronomer Sir John Herschel (Young, 2017). Another iconic example is the 1938 U.S. radio broadcast of *The War of the Worlds*, which convinced many listeners that Earth was under Martian attack (Schwartz, 2016). Throughout the 20th century, including World Wars I and II, regional conflicts, and the Cold War, fabricated information remained a powerful strategic weapon, with propaganda and manipulation used by governments and military leaders to influence both domestic audiences and enemy forces.

The advent of the Web 2.0 paradigm in the early 2000s marked a transformative shift toward a more interconnected, collaborative, and interactive Web, characterized by vast volumes of user-generated content via blogs, social media, and online news platforms. This accelerated the global spread of fake news, making false information widespread across Web 2.0 platforms (Gohil & Nightingale, 2023). In this environment, falsehoods often circulate rapidly through digital channels, outpacing the truth and deceiving even the most vigilant readers due to the difficulty of detecting and preventing misinformation (Juul & Ugander, 2021).

During the COVID-19 pandemic, disinformation and conspiracy theories regarding the virus scope, origin, prevention, and treatment, spread widely across social media, messaging platforms, and mass media. Alarming, not only celebrities, politicians, and influencers, but also governments contributed to their dissemination (Kassam, 2020). Today, large-scale information fabrication continues around major geopolitical events.

The timeline of modern-day *information disorder*, a term coined to describe 21st-century global *information pollution*, has become increasingly crowded with events. This concept encompasses all the challenges posed by misinformation, disinformation, and malinformation, especially given the unprecedented scale and complexity of information flows in a hyperconnected yet polarized world. *Misinformation* refers to false information shared without intent to harm or deceive, typically resulting from unintentional errors; *Disinformation* is false information, a deliberately fabricated or manipulated content, spread with the intent to deceive or cause harm for political, financial, or social gain; *Malinformation* involves genuine content shared to inflict harm to a person's reputation, a deliberately exposed private information

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