Comment

From Discovery to Production: Scientific Research in the Age of Information Overload

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Citation: Buccione E. "From Discovery to Production: Scientific Research in the Age of Information Overload" (2026) *International Journal of Health Supplements* 1(Suppl. 1):7-9. DOI: https://doi.org/10.82051/ijhs-2026-523

Scientific research is undergoing a deep transformation. During the last century, the value of a scientist was associated with the ability to generate meaningful discoveries. Today, however, the academic system appears increasingly oriented toward a logic of continuous production, measured through quantitative indicators.

This evolution is not without consequences. Peter Densen observed that medical knowledge was expanding at an unprecedented rate, citing an estimate that has since become widely recognized: the time required for medical knowledge to double was approximately 50 years in 1950, 7 years in 1980, 3.5 years in 2010, and only 73 days by 2020 (Densen, 2011). While this exponential growth undoubtedly represents an extraordinary opportunity for scientific progress, it also raises fundamental questions about the ability of the academic community to assimilate, critically evaluate, and transform such a vast amount of information into genuinely useful knowledge.

The challenge, in fact, is no longer access to information, but its overwhelming abundance. Millions of scientific articles are published every year, making it impossible for any researcher to maintain a comprehensive view even within a highly specialized field. What was once considered a manageable organizational challenge has evolved into one of the defining structural characteristics of contemporary science: information overload.

Accompanying this uncontrolled growth of the scientific literature is a more subtle phenomenon: the gradual transformation of research from a discovery-driven endeavor into a productivity-driven system. Academic evaluation mechanisms, largely based on bibliometric indicators, inevitably shape researchers' behavior. What is measured becomes what is pursued. When professional success depends primarily on publication counts, citation metrics, and the h-index, there is a risk that quantity will replace quality and that visibility will replace scientific value.

Within this context, a new form of psychological pressure has emerged, particularly among early-career researchers: the Fear of Missing Out (FOMO) (Zhou et al., 2025). Many scientists live with the persistent feeling that are not fast enough: that they are not reading enough, publishing enough, or participating in enough collaborations and projects. Every day brings new articles, preprints, datasets, and networking opportunities, with the perception that pausing even briefly may lead to exclusion from the global scientific conversation.

The most concerning consequence is the gradual erosion of time dedicated to reflection. Major scientific breakthroughs have rarely emerged from haste. More often, they are the

Funding: This research received no external funding. **Conflict of Interest:** The author declares no conflicts of interest.

result of years of observation, failure, intuition, critical thinking, and intellectual maturation. Science requires slowness as much as it requires innovation. It requires the courage to remain focused on a difficult question, even when that effort does not immediately produce another publication.

Yet today, time for reflection seems increasingly to have become a luxury. The pressure to produce continuously risks transforming researchers into producers of outputs rather than explorers of knowledge.

The most important challenge facing the scientific community in the coming years will not be to further increase the quantity of knowledge produced, but to recover the very meaning of research itself. In an ecosystem dominated by information abundance and bibliometric competition, we must once again learn to value what cannot be easily measured: originality of thought, intellectual depth, the ability to challenge established paradigms, and the courage to pursue genuinely important questions.

Because scientific progress does not depend on the number of articles we publish, but on our ability to generate ideas that will continue to matter long after most of those articles have been forgotten.

References

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