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# 1 Post-publication review: The role of 2 science news outlets and social 3 media

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## 16 **Abstract**

17 This article explores the significant role of post-publication review in maintaining research integrity

18 and the potential of science news outlets and social media to improve the process. By examining

19 recent cases, this article reveals the vulnerabilities of pre-publication peer review and suggests a

20 more inclusive approach. The importance of broader public scrutiny is emphasized, as retractions

21 in these cases occurred only after gaining significant attention on social media. The term "peer-

22 review" should be expanded to include various experts and platforms beyond traditional academic  
23 journals. The incidents examined in this study underscore the necessity of openness and vigilance  
24 in maintaining research integrity, especially in the era of artificial intelligence and digital platforms.  
25 Researchers need to understand that research integrity extends beyond journal-led pre-publication  
26 reviews. They should also apply their scientific intellect by conducting post-publication reviews.

27 Keywords: pre-publication reviews, post-publication reviews, journal-led peer review, community-  
28 led peer review, academic misconduct, research integrity,

## 29 **Introduction**

30 The integrity of scientific research is crucial for the advancement of knowledge and societal  
31 progress <sup>1</sup>. Traditional pre-publication peer review has long been the cornerstone of ensuring  
32 research quality <sup>2</sup>. However, the emergence of digital platforms and social media has exposed  
33 the limitations of this process <sup>3</sup>. This article explores the significant role of post-publication  
34 review in maintaining research integrity and the potential of science news outlets and social  
35 media to improve the process.

36 The integrity of scientific research is crucial for advancing knowledge and societal progress.  
37 Ensuring the quality and reliability of research findings is fundamental not only for the scientific  
38 community but also for the public, which relies on scientific evidence to make informed  
39 decisions in healthcare, technology, policy-making, and education <sup>4,5</sup>.

40 Traditional pre-publication peer review has long been the cornerstone of ensuring research  
41 quality. In this rigorous process, experts evaluate the validity, significance, and originality of a  
42 manuscript before it is published. This critical filter helps reduce the chances of flawed or  
43 unsubstantiated findings from entering the scientific literature <sup>6</sup>.

44 However, the traditional peer review system is not without its flaws and limitations. Issues such  
45 as reviewer bias, conflicts of interest, and the occasional inability of reviewers to detect all errors  
46 or fraudulent data have been well-documented. Moreover, the peer review process can be time-  
47 consuming, often leading to significant delays in the dissemination of important findings. As  
48 science evolves and the volume of research outputs grows exponentially, the traditional  
49 publishing and reviewing system is increasingly strained, prompting calls for more efficient and  
50 transparent methods of quality control <sup>7</sup>. This was particularly evident during the COVID-19  
51 pandemic in which scholars have observed a strong shift in publishing and overall dissemination  
52 practices along with growing integrity issues <sup>8,9</sup>.

53 The emergence of digital platforms and social media has highlighted the limitations of traditional  
54 peer review <sup>10</sup>. In today's fast-paced, interconnected world, scientific findings can be shared  
55 instantly with a global audience, bypassing traditional publication channels. This shift has  
56 changed how research is disseminated and scrutinized. While these digital platforms  
57 democratize access to scientific knowledge and encourage broader engagement, they also  
58 present challenges in maintaining the integrity and credibility of the information shared <sup>11-15</sup>.

59 In this context, post-publication review has become important for ensuring research quality.  
60 Unlike traditional peer review, which occurs before publication, post-publication review involves  
61 evaluating and critiquing research after it is publicly available. This ongoing process allows for a  
62 more dynamic and inclusive assessment of scientific work, leveraging the global scientific  
63 community's collective expertise. Post-publication review can include formal commentary in  
64 academic journals, informal discussions on social media, and evaluations on dedicated  
65 platforms like PubPeer <sup>16-19</sup>.

66 Science news outlets and social media play a significant role in this evolving landscape. These  
67 platforms facilitate the rapid dissemination of research findings and serve as venues for public

68 engagement and post-publication critique. Science journalists and communicators have the  
69 expertise to interpret and contextualize complex scientific information for a broader audience,  
70 potentially identifying and highlighting both strengths and weaknesses in newly published  
71 studies. Social media platforms, with their vast reach and interactive features, enable real-time  
72 discussions and debates among scientists, journalists, and the public, enhancing the  
73 transparency and accountability of the scientific process <sup>16-21</sup>.

74 This article explores the significant role of post-publication review in maintaining research  
75 integrity. It examines how integrating science news outlets and social media into the post-  
76 publication review process can improve the quality and reliability of scientific research. By  
77 providing a platform for continuous scrutiny and discourse, these digital tools can help identify  
78 errors, validate findings, and highlight important research that might otherwise be overlooked.  
79 The article also addresses the challenges and potential pitfalls of relying on these platforms,  
80 including the risk of misinformation, the variability in the quality of commentary, and the need for  
81 effective moderation and fact-checking.

82 Ultimately, integrating post-publication review with traditional peer review represents a more  
83 holistic approach to maintaining research integrity. By embracing both pre- and post-publication  
84 scrutiny, the scientific community can better ensure that research findings are robust, reliable,  
85 and beneficial to society. This article aims to contribute to the ongoing dialogue about  
86 leveraging new technologies and platforms to enhance the integrity and impact of scientific  
87 research.

## 88 **Case studies**

89 Seven recent significant academic cases, three of which involve Indonesian authors (in  
90 chronological order), were considered and examined in this article.

91 **Case 1 (2010)**

92 In January 2024, the American Society for Microbiology (ASM) journals that published, in the 2010,  
93 seven studies from Institut Méditerranée Infection (IHU-MI), announced that it retracted all seven  
94 studies on the grounds of ethical issues in how the research was conducted. This stems from an  
95 article by Franck et al. which highlighted concerns with ethics approval practices of 456 papers  
96 published by the same institute <sup>22</sup>. Following this article, an independent investigation reached the  
97 conclusion that many of the studies (15 retracted so far) did not obtain proper ethics and/or legal  
98 approvals for the studies they conducted on human beings in a clinical setting. The overall  
99 investigation on this matter, summarized by O’Grady for Science <sup>23</sup>, highlight severe failures of  
100 control processes and the work done by “dogged scientists” outside of the classical peer review  
101 system as well as their efforts and issues to try and get French institutions and publishers to react.

102 This case clearly highlights the specific issues that whistleblowers may face when reporting on  
103 potentially unethical or illegal practices within an institute. Nonetheless, it has sparked  
104 discussions on the importance of more transparency in ethical procedures and their approvals and  
105 perhaps the upload of documents supporting those.

106 **Case 2 (2021)**

107 A prominent paper on COVID-19 and the usefulness of lockdowns to reduce the number of cases  
108 was published by Savaris et al. in March 2021 in *Scientific Report* and retracted in December 2021  
109 <sup>24</sup>. The article found, in essence, that lockdowns do not help reduce the number of COVID-19  
110 cases. However, concerns raised on Pubpeer and through a preprint rapidly arose since the Savaris  
111 et al. study was massively shared on social media. Concerns were raised by independent teams of  
112 researchers who found the article through social media and acted quickly to post their

113 methodological concerns: Meyerowitz-Katz et al. failed to replicate the original results using a  
114 synthetic dataset<sup>25</sup>, while Góes found issues with the model being used mathematically<sup>26</sup>.

115 While the article was eventually retracted, its impact, for the nine months it was online for, was  
116 incredible, in particular considering how it may have impacted public health measures. In this  
117 case, the correction and retraction of the article is definitely too slow and may negatively impact  
118 citizens directly, echoing calls for a faster correction of the scientific literature  
119 (<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001572>).

### 120 Case 3 (2023)

121 More generally, on the use of language manipulation to avoid plagiarism detection, the recent  
122 discovery by Cabanac et al. of tortured phrases is important<sup>27</sup>. The authors discovered that known  
123 scientific expressions are being changed to nonsensical ones to avoid being found by plagiarism  
124 checks in the case of paper mills products. Similarly, papers and reviews generated by ChatGPT  
125 seem to be found because authors and reviewers have also copied and pasted the “regenerate  
126 response” button into their main text<sup>28</sup>.

127 In both cases, these manipulations did not seem to be spotted by pre-publication peer review and  
128 it is a post-publication assessment that is bringing light onto them. The use of tortured phrases  
129 appears to be quite common and its detection is now automated thanks to the Problematic Paper  
130 Screener ([https://dbrech.irit.fr/pls/apex/f?p=9999:1:::\)](https://dbrech.irit.fr/pls/apex/f?p=9999:1:::) which prompts post-publication  
131 reassessment of papers found to contain tortured phrases<sup>29</sup>.

## 132 **Case 4 (2024)**

133 The article by Dr. Danny Hilman Natawidjaja and his team, published in *Archaeological*  
134 *Prospection*<sup>30</sup>, claimed that the megalithic site of Gunung Padang in Indonesia was constructed as  
135 a pyramid around 25,000 years ago. This conclusion was based on ground-penetrating radar  
136 surveys and radiocarbon dating results. The study initially generated significant interest due to its  
137 implications for our understanding of ancient human civilizations.

138 However, the article was later retracted after experts in geophysics, archaeology, and radiocarbon  
139 dating raised substantial concerns. The primary issue identified was the misapplication of  
140 radiocarbon dating techniques. Specifically, the researchers dated soil samples that were not  
141 directly associated with any man-made artifacts or structural features, which led to an erroneous  
142 interpretation of the site's age. These soil samples provided dates that were significantly older than  
143 the actual construction of the megalithic structures, thus invalidating the claim of a 25,000-year-  
144 old pyramid.

145 This case underscores the importance of proper methodology in scientific research and the critical  
146 role of peer review and post-publication scrutiny in maintaining research integrity. By highlighting  
147 potential methodological flaws, the scientific community can correct the record and ensure that  
148 future research builds on accurate and reliable data.

## 149 **Case 5 (2024)**

150 A scientific study published in *Frontiers in Cell and Developmental Biology* claimed to use an  
151 artificial intelligence (AI) image generator to produce groundbreaking biological images<sup>31</sup>.

152 However, the images were later revealed to be nonsensical and generated without any meaningful



153 scientific basis. The publication faced widespread criticism from the scientific community, leading  
154 to its retraction.

155 Experts pointed out that the AI-generated images did not represent any real biological phenomena  
156 and that the study lacked the necessary rigor and validation. This incident underscores the critical  
157 importance of thorough peer review and the responsible application of AI technologies in scientific  
158 research. It highlights the potential risks of integrating advanced technologies without adequate  
159 oversight and emphasizes the need for stringent review processes to ensure the credibility and  
160 reliability of published research. By addressing these issues, the scientific community can  
161 safeguard against the dissemination of misleading or erroneous information and maintain the  
162 integrity of scientific literature.

### 163 **Case 6 (2024)**

164 Kumba Digdowiseiso, a young professor and Dean at Universitas Nasional Indonesia, faced serious  
165 allegations of academic misconduct<sup>32</sup>. The controversy arose when lecturers from Universiti  
166 Malaysia Terengganu discovered that their names had been listed as co-authors on several of  
167 Kumba's publications without their consent. This unauthorized inclusion of international  
168 academics as co-authors has raised significant concerns about academic integrity.

169 The issue has sparked widespread discussions in Indonesia about the ethical standards and  
170 practices within the academic community. It highlights the need for stricter enforcement of ethical  
171 guidelines and transparency in the publication process. The incident has also led to calls for  
172 comprehensive reforms in higher education policy to prevent such misconduct in the future and to  
173 protect academic freedom. Ensuring the integrity of academic work is crucial for maintaining the

174 credibility and trustworthiness of scholarly research, and this case underscores the importance of  
175 vigilance and accountability in academic publishing.

## 176 **Case 7 (2024)**

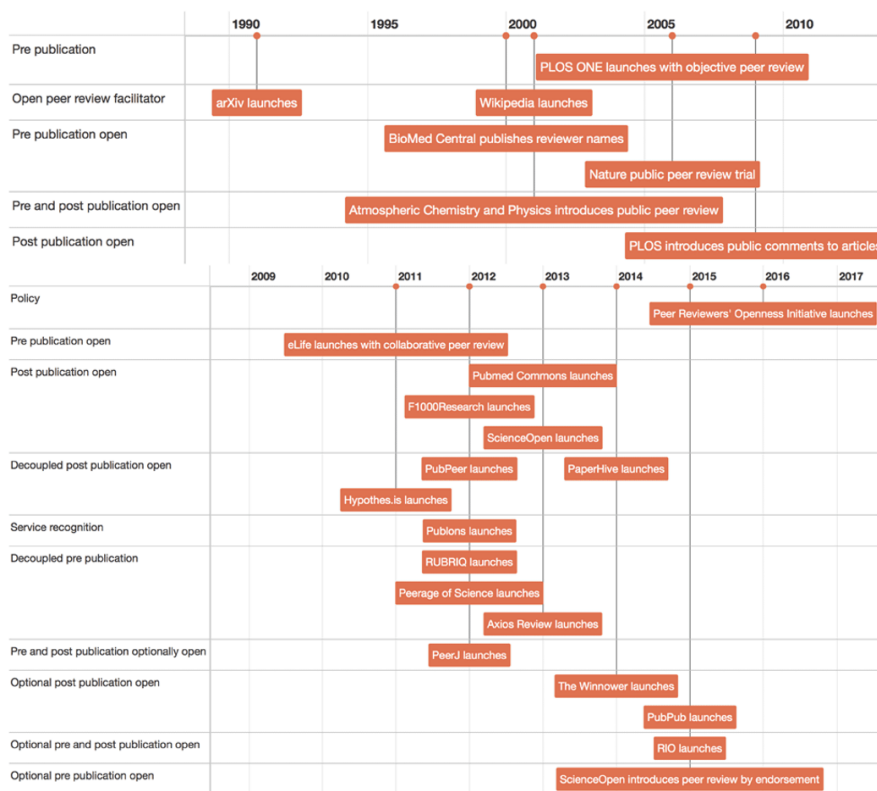
177 The potential misuse of AI technology for plagiarism has become a growing concern in the  
178 academic community. A recent incident highlighted this issue when an author<sup>33 34</sup> discovered that  
179 their original manuscript had been copied and subtly rephrased using AI, then subsequently  
180 published by another individual<sup>35</sup>. This blatant disregard for intellectual property rights not only  
181 disrespects the original author's work but also contributes nothing new to the body of knowledge.

182 This case underscores the dangers of using AI to facilitate academic dishonesty. Such practices  
183 dilute the value of genuine research and undermine the trust that is fundamental to scholarly  
184 communication. The incident has sparked discussions about the need for robust plagiarism  
185 detection tools and stricter enforcement of ethical standards in publishing. It also emphasizes the  
186 importance of educating researchers about the responsible use of AI and the significance of  
187 intellectual property rights. Ensuring the integrity of academic work is essential for maintaining the  
188 quality and credibility of scientific research, and this case highlights the need for vigilance and  
189 accountability in the era of advanced technologies.

## 190 **Reflecting on Traditional Pre-Publication Review**

191 While this article isn't intended to review the history of peer review, the following articles provide  
192 insight into the situation. Peer review has a rich history that dates back to the 17th century, when it  
193 originated with national academies in Europe, as has been presented beautifully as [R-Shinyapps](#)  
194 and published in<sup>36,37</sup> (Figure 1). During this period, it evolved from informal discussions to more

195 structured and organized evaluations. As we transitioned into the 19<sup>th</sup> century, the concept of peer  
 196 review underwent further formalization and professionalization, fuelled by the rapid proliferation of  
 197 scientific journals during this time.



Tennant JP, Dugan JM, Graziotin D et al. A multi-disciplinary perspective on emergent and future innovations in peer review [version 3]. F1000Research 2017, 6:1151 (doi: 10.12688/f1000research.12037.3)

F1000Research

198

199 Figure 1. A brief timeline of the evolution of peer review: The revolution (Tennant et al., 2018).

200 Following World War II, peer review became a widespread practice in academia and publishing.

201 Innovations such as open peer review and digital platforms have emerged in recent years to

202 enhance transparency and efficiency. Even though peer review plays an essential role in ensuring

203 the quality of research and also significantly influences academic prestige and career progression,

204 it has been subject to criticism due to perceived biases and a lack of transparency. There is also a

205 limited understanding of the responsibilities of editors and the biases of reviewers. To address

206 these issues, it is suggested that there should be increased accountability, standardization of  
207 practices, and improved data infrastructure to support the study of peer review <sup>37,38</sup>.

208 Peer review is crucial for research validation and career progression but faces challenges like  
209 biases and inefficiencies. Innovations have arisen to address these issues, but adoption is slow.  
210 The rise in publication volume has led to reviewer fatigue and uneven workload distribution  
211 globally. The traditional research moderation and quality control are evolving into a more  
212 collaborative and engaging system, allowing unrestricted content types and formats, and a semi-  
213 automated review matching system. Researchers' activities will be measured based on  
214 engagement quality, and identification will shift from closed to fully transparent systems tied to  
215 academic profiles. This new framework aligns with the 'open science' movement and encourages  
216 debates on peer review, pushing for a more rigorous scholarly evaluation method and exploration  
217 of the scholarly communication ecosystem <sup>39-42</sup>.

218

## 219 **The Role of Post-Publication Review**

### 220 **Challenging Science via Post-Publication Review**

221 Each of the fore-mentioned cases was brought to light by an observant individual (in case number  
222 4, it was one of the authors) who noticed the flaws and/or misconduct, and posted about them on  
223 social media. While the first case could be seen as an over-analysis of data, the remaining  
224 instances represented clear misconduct. Notably, in all these situations, the decision to retract  
225 was taken only after the posts had gained significant attention and gone viral on social media  
226 platforms.

227 These cases highlight the significant role of post-publication review in challenging science, as they  
228 were unveiled by observant individuals who posted about the flaws or misconduct on social media.  
229 Notably, retractions were decided only after these posts garnered significant attention on these  
230 platforms, demonstrating the power and importance of public scrutiny in maintaining research  
231 integrity.

232 This evidence suggests that the term "peer-review" should be broadened in terms of its timing and  
233 its reviewers:

- 234 1. With respect to the timing of the review process, it's important to note that scientific  
235 publications should not be exclusively dependent on the traditional method of pre-  
236 publication evaluation. This traditional approach has demonstrated its vulnerabilities over  
237 time, as it has been known to approve articles that are, upon further review, questionable in

238 their validity or scientific integrity. Therefore, it is crucial to consider alternative or  
239 additional methods to ensure a more thorough and rigorous review process.

240 2. From a journal and scientific perspective, critical assessment of a piece of the literature in  
241 one's own article should be, de facto, considered as a form of peer-review. When citing  
242 articles, scientists often have to judge the quality and applicability of the findings. Their  
243 citations could therefore be considered as peer review of past work and help scientists,  
244 laypeople, and publishers better understand the value of a published piece. This would  
245 further highlight the limitation of considering "citations" as a metric of success. Not only  
246 could those be gamed and manipulated, but they are also, if used as a metric, hiding the  
247 value of the citation. In other words, a negative citation as a positive impact on one's  
248 career, which seems counterproductive.

249 3. From a reviewer's standpoint, assessments of an article should not be limited to two or  
250 three experts assigned by a journal. A more comprehensive peer review process would  
251 involve, for instance, statisticians, methodologists, general scientific experts, or  
252 practitioners with extensive experience. The medium for commentary should not be  
253 confined to academic journals (in form of commentary article), but should expand to  
254 various science news outlets like [The Conversation](#), and various social media platforms,  
255 including YouTube, or general researchers can use specialized tools or platforms like:  
256 [Hypothesis \(http://hypothes.is\)](http://hypothes.is) to write comments or annotations directly on the web page.

257 4. In addition to their development, science news outlets and social media can play a critical  
258 role in reviewing preprints as part of pre-publication reviews. This occurs when a journal  
259 mandates public discussion of a manuscript. This concept has been popularized by  
260 community-led movements such as [Prereview \(https://prereview.org/\)](https://prereview.org/) and [Peer](#)  
261 [Community In \(https://peercommunityin.org/\)](https://peercommunityin.org/).

262 While it's important to acknowledge that this particular method isn't universally applicable, and it's  
263 certainly true that not all research can be thoroughly examined in this manner, its value cannot be  
264 understated. It is, in fact, extremely useful in specific contexts and scenarios. This method is  
265 particularly valuable for uncovering clear errors or instances of unethical behavior. These could be  
266 subtle inconsistencies that might initially go unnoticed or more blatant transgressions that  
267 blatantly defy ethical standards. In either case, this method serves as a powerful tool in  
268 maintaining the integrity of research efforts.

## 269 Enhancing Scientific Understanding through Post-Publication Reviews

270 Post-publication reviews in the scientific community should serve as vital tools for deepening our  
271 comprehension of research outcomes. Facilitated by platforms such as social media and scientific  
272 news outlets, these reviews offer a space for further discussion, analysis, and exploration of the  
273 respective research article. This process fosters a more detailed and nuanced understanding of the  
274 research findings, surpassing the preliminary conclusions of the published article <sup>43</sup>.

275 These discussions and debates naturally lead to fresh insights, new interpretations, and inspiration  
276 for new research. They highlight previously overlooked aspects of the study, and challenge  
277 researchers to view their work from different perspectives. This provides an invaluable source of  
278 inspiration for future studies by identifying gaps in existing research and suggesting potential  
279 avenues for further exploration <sup>44</sup>.

280 Post-publication reviews hold substantial influence beyond the academic community. By making  
281 these discussions available to the public, they can improve scientific literacy among non-experts.  
282 However, a scientific article is less likely to gain as many readers as an engaging YouTube podcast

283 would garner viewers. This exposure can foster a better appreciation for the scientific process,  
284 stimulate critical thinking, and promote informed decision-making.

285 University students and early career researchers could also practice their knowledge by reviewing  
286 published articles via journal clubs. They would have more opportunities to engage with the original  
287 authors when asking questions or clarifying unclear points. This practice not only enhances their  
288 critical thinking and analytical skills but also fosters a collaborative academic environment where  
289 knowledge is continuously refined and expanded.

290 By participating in the review process, these emerging scholars can contribute fresh perspectives  
291 and insights, potentially identifying overlooked aspects or suggesting new interpretations.

292 Additionally, post-publication reviews not only benefit the scientific community but also enhance  
293 society's overall comprehension of science.

294 Despite its advantages, like the opposing pre-publication review, post-publication review also  
295 encounters challenges such as the need for efficient processes, ensuring review quality and  
296 relevance, and addressing scope and standards issues <sup>45</sup>.

## 297 Expanding the Definition of "Peer-Review"

298 **The term "peer-review" should be expanded to encompass various experts and platforms**  
299 **beyond traditional academic journals. This broader approach includes:**

- 300 ● **For independent researchers:** Encourage researchers outside the immediate field to  
301 review and critique studies. For example, consider the interdisciplinary efforts seen in  
302 the critique of the power pose study <sup>46</sup>.
- 303 ● **For science journalists:** Leveraging their investigative skills to uncover potential  
304 issues, as demonstrated by pieces on the flaws in the Surgisphere data <sup>47</sup>.



- 305       ● **For citizen scientists:** The involvement of informed laypersons is incredibly valuable as  
306       they can provide unique perspectives and pose relevant questions that may not be  
307       considered by professional scientists. This is demonstrated by the significant  
308       contributions of patient advocacy groups in critiquing medical research. These groups  
309       have been instrumental in highlighting overlooked areas of study, advocating for patient-  
310       centered approaches, and ensuring that research outcomes are more widely  
311       disseminated and understood by the general public <sup>48</sup>.
- 312       ● **For social media platforms:** Utilize the vast reach and immediacy of social media to  
313       facilitate in-depth discussions and reviews among a diverse audience. This is illustrated  
314       by the extensive public discourse on platforms such as X surrounding the retraction of  
315       various high-profile studies. Social media enables rapid dissemination of information and  
316       allows for real-time feedback and engagement from a global audience. Additionally, it  
317       provides a space for experts and laypersons alike to share insights, debate findings, and  
318       collectively enhance the quality and transparency of scientific research <sup>49</sup>.

## 319   Science News Outlets and Social Media to Democratize Review

### 320   Process

321   Science news outlets and social media platforms have democratized the review process by  
322   allowing a broader audience to scrutinize research findings. This expanded "peer-review"  
323   includes experts from various fields and laypersons who can contribute valuable insights. The  
324   retractions in the cases mentioned above occurred only after these broader public reviews  
325   gained traction, as shown by the following roles:

- 326       ● **To invite evaluation from diverse expertise:** Involving a wider range of experts can  
327       identify issues that traditional peer reviewers might miss. For instance, the rapid critique

328 of the Surgisphere studies <sup>50,51</sup>, by epidemiologists, data scientists, and clinicians  
329 highlighted issues that were not caught in the initial review.

330 ● **To increase transparency:** Public scrutiny ensures greater transparency and  
331 accountability in the research process. The open discussion of the STAP cell  
332 controversy on platforms like [PubPeer](#) and [X](#) (formerly Twitter) brought transparency to  
333 the retraction process <sup>52</sup>. In 2014, a study claiming the creation of pluripotent stem cells  
334 through a simple acid bath (STAP cells) was published in *Nature*. Initial peer review did  
335 not catch critical errors. However, after extensive scrutiny from the scientific community  
336 on PubPeer and social media, numerous inconsistencies and image manipulations were  
337 identified, leading to retraction of the articles and an investigation into research  
338 misconduct.

339 ● **To detect errors faster:** The rapid dissemination of information on digital platforms can  
340 lead to quicker identification and correction of errors. This efficiency is particularly  
341 evident in how the scientific community can promptly address inaccuracies. For  
342 instance, the swift response to the flawed COVID-19 studies exemplifies this capability,  
343 where researchers and experts around the world were able to collaborate and rectify the  
344 mistakes in a timely manner. The process not only enhances the reliability of the  
345 information but also fosters a more transparent and accountable environment. An  
346 example of such a swift response can be seen in the rapid correction of some of the  
347 flawed COVID-19 studies <sup>50</sup>.

348

## 349 **Implications for the Scientific Community**

350 It's crucial for researchers to understand that research integrity extends beyond journal-led pre-  
351 publication reviews. They should also (see Figure 2):

- 352     • **Engage in Post-Publication Reviews:** Actively participate in reviewing published  
353         research to identify and address errors or misconduct. This process is crucial for  
354         maintaining the integrity and reliability of scientific literature. Consistent engagement in  
355         post-publication reviews ensures that any discrepancies, mistakes, or unethical practices  
356         are promptly corrected. This is especially important in fields with rapid technological  
357         advances, such as AI and biotechnology, where the pace of innovation can lead to  
358         frequent updates and revisions in research findings.
- 359     • **Foster a Culture of Openness:** Encourage transparency and openness in the research  
360         process to build and maintain public trust in science. Researchers should promote  
361         practices that make their work more accessible and understandable to the public.  
362         Initiatives such as open data and open access can assist in achieving this aim by  
363         allowing anyone to review and replicate studies. Additionally, holding open forums and  
364         discussions about research processes and findings can further enhance public  
365         engagement and trust.
- 366     • **Leverage Digital Platforms:** Utilize social media and other digital platforms to  
367         disseminate findings and engage with a broader audience. By actively sharing research  
368         updates and insights on platforms like Twitter, LinkedIn, and ResearchGate, scientists  
369         can reach individuals who might not traditionally engage with academic journals.  
370         Indonesian researchers can benefit from participating in global scientific discussions and  
371         critique, thus gaining diverse perspectives and potentially fostering international

372 collaborations. Engaging with a wider audience through digital means also helps in  
373 raising awareness and appreciation of scientific work among the general public.

## 374 **Conclusions**

375 The incidents examined underscore the necessity of openness and vigilance in maintaining  
376 research integrity, especially in the era of artificial intelligence and digital platforms. Scientific  
377 misconduct, especially when it gains visibility through social media, can significantly impact the  
378 credibility and reputation of the academic and scientific community.

379 Researchers worldwide, and particularly in Indonesia, must understand the importance of  
380 maintaining research integrity, recognizing that this responsibility extends beyond traditional pre-  
381 publication reviews.

382 As we move forward, it is essential to emphasize the role of post-publication reviews in identifying  
383 potential mistakes or issues that might have been overlooked. Researchers should continue to  
384 apply their scientific knowledge and critical thinking skills to review studies even after they have  
385 been published. This ongoing scrutiny is a crucial part of maintaining and enhancing the overall  
386 quality of scientific research.

387 By expanding the definition of peer review and embracing broader public scrutiny, the scientific  
388 community can better safeguard the quality and credibility of research. Researchers must  
389 recognize the value of post-publication review and contribute to a more inclusive and  
390 transparent scientific process.

391 The digital era calls for a new approach to scientific research and review. Open discussions,  
392 enabled by social media and other platforms, are key to addressing and learning from

393 instances of scientific misconduct. By fostering a culture of continuous review and learning, we  
394 can improve the credibility, accuracy, and overall quality of scientific research.

### 395 **Data Availability**

396 No data is used in this study.

397

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400

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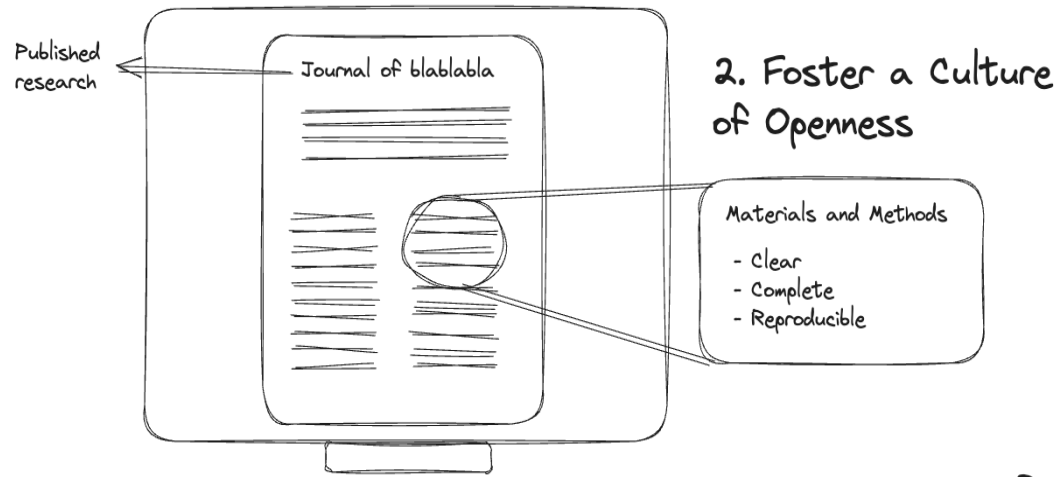
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### 405 **Contributions**

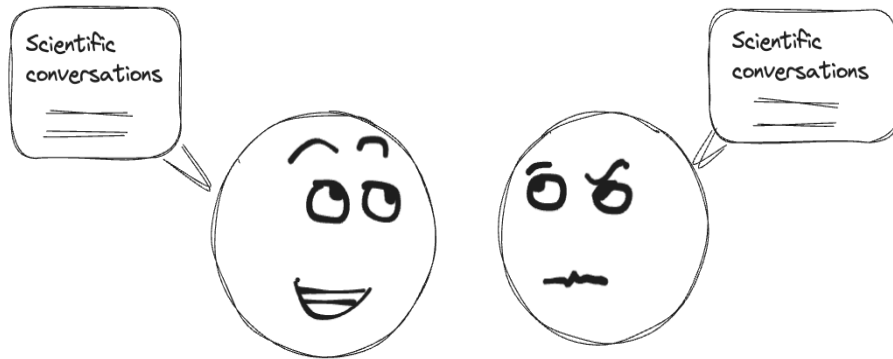
406 DEI conceived the presented idea. All authors discussed and wrote the manuscript.

### 407 **Conflicts of interest**

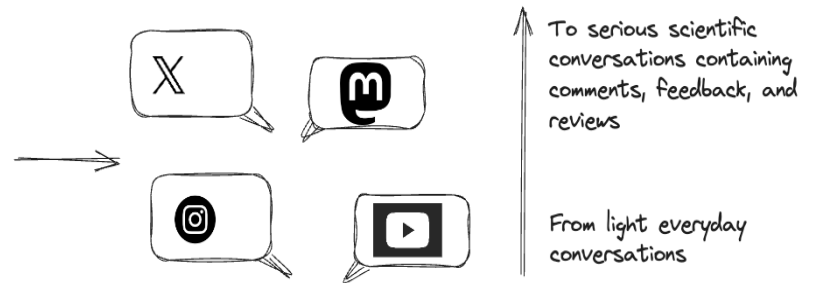
408 The authors declare no conflicts of interest relevant to the content of this manuscript.



### 1. Engage in Post-Publication Reviews



### 3. Leverage Digital Platforms



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