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Ensuring Research Integrity: Plagiarism, Fabrication, and Falsification

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Abstract

In the corporate world, investors and founders place a high value on "financial stability, and business intelligence (BI)" is a key instrument for greatly boosting this stability. The main goal of financial management is to raise money for the business at a minimal cost and use that money to generate enormous profits. In this article review the various literature's study on business intelligence tools in corporate financial management. It concluded that the evolution of business intelligence (BI) tools has revolutionized corporate financial management by enhancing decision-making, optimizing operations, and mitigating risks. These tools empower organizations with advanced data analytics, enabling strategic financial planning and resource efficiency. By identifying and forecasting financial risks, BI ensures stability and sustainability in business practices. Finance departments leverage BI to correlate financial outcomes with business activities, aligning strategies with corporate objectives. Technologies like OLAP and data mining facilitate intelligent decision-making in complex financial environments. As businesses become increasingly data-driven, BI tools serve as essential assets, fostering growth, competitiveness, and long-term success in an ever-evolving financial landscape.

Keywords: Research (scientific) integrity, Plagiarism, Fabrication, Falsification, Research (scientific) misconduct, P-hacking etc.

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1 Introduction

One cannot undervalue the significance of Research Integrity (RI). RI is thought of as a mechanism that maintains public trust in scientists and research while simultaneously protecting the professional careers and reputations of researchers. RI is important for promoting social and economic progress [1]. Researchers, people, research funders, and government officials in charge of scientific policy all gain from it and trust is fostered. At the core of the research process is RI. It provides the basis for the public's confidence in research findings, evidence, and scientists as well as enabling scientists to trust one another and the data. The public and patients are shielded by RI from the detrimental effects of inaccurate and misleading data [2].

Finding scientific truth requires a lot of creativity, critical thinking, honesty, integrity, candour, perseverance, and persistence. These are the cornerstones that need to be used in every scientific undertaking in order to preserve and uphold the integrity of scientific literature for the advancement of humanity. Several months of meticulous project preparation and execution culminate in the publishing of a scholarly article. In the interest of science, the task must be conducted impartially, honestly, and objectively, and the findings must be communicated honestly. However, there are situations when deliberate deceptions or ignorance cause departures from the ideal. Scientific misconduct is the term used to describe these intentional or unintentional departures from the ideal [3].

Research misconduct has existed since the early days of art and science's development, but it has recently increased sharply due to academic competition, the desire for quick success through shortcuts, and the desire for publications to boost one's reputation. Perhaps the United States Public Health Service has the most thorough and legally sound description of research misconduct: plagiarism, fabrication, or falsification in the proposed, carried out, or evaluated study, or in the reporting of research findings. Disagreements or honest mistakes are not considered research misconduct. Science advances because of scientific literature. On the other hand, research misconduct undermines it and has a negative impact on the reliability, validity, and relevance of scientific results [4].

A. Research integrity

As a dynamic and wide concept, research integrity may be defined as the ethical, robust, and transparent conduct of the research process when proposing, carrying out, assessing, and reporting research results. It entails adherence to generally recognised professional standards and conventions as well as laws, rules, and guidelines. Robustness, honesty, openness, respect, and accountability are the fundamental tenets of research integrity [5]. Both individual researchers and the whole research community—including academic institutions, funding organisations, regulatory agencies, and scientific journals—are impacted by research integrity. Research integrity, which is part of the larger idea of responsible conduct of research (RCR), is governed by values and principles. RCR acts as a useful framework that converts the broad ethical and research integrity principles into doable rules, encouraging moral conduct and judgement in researchers' daily work [6].

B. Research misconduct

Research misconduct is defined as behaviours or dubious research methods that do not meet the norms of scholarship, research, and ethics necessary to maintain the integrity of study. It wastes money, compromises the scientific record, harms people and the environment, and erodes the credibility of research. The term "falsification, fabrication, and plagiarism" is often used to describe it [7]. Examples include fabricating data or findings, giving false credit to authors, manipulating research tools, materials, or procedures, or altering or deleting data, graphs, pictures, or results. Poor research design, misdemeanours, and other harmful activities are all part of the much larger category of questionable research techniques. Often referred to as "sloppy science," some of these may be used without considering the possible repercussions for the integrity of the study rather than in an effort to deceive. The main issues in avoiding research misconduct are falsification, fabrication, and plagiarism (FFP), which are referred to as the three "cardinal sins" of research conduct. The integrity of research for that person, lab, university/company, and the field at large is compromised by any departure from these standards [8].

C. Elements of research misconduct

Fabrications: Fabrication is the practice of creating data, such as reporting on patients or studies that never happened. Falsification may be mistaken for fabrication in many situations. False data or outcomes are recorded or reported, which is known as fabrication. The act of producing data without doing necessary investigation is known as fabrication. If research results have not been conducted honestly, they should not be discussed, shared, or published [9], [10].

Falsification: Falsification may be described as the alteration or omission of data or findings, or the manipulation of research materials, tools, or procedures such that the study is not correctly documented in the research record. Falsification is the act of altering an experiment's design or outcomes in a way that is not supported by science. In most cases, to improve or eliminate findings that don't fit the hypothesis. Falsification is regarded as serious research misconduct, much like fabrication and plagiarism. It is defined as altering, deleting, or concealing data or findings without cause, as well as modifying research materials, tools, or procedures, according to the European Code of Conduct [9], [11].

Plagiarism: The act of presenting someone else's words, ideas, or work as one's own without proper attribution or permission is known as plagiarism. Academia and other disciplines that depend on the integrity of intellectual property regard it as a severe ethical violation [9].

D. Scientific misconduct's impacts

Numerous stakeholders and the scientific community at large are greatly impacted by scientific misconduct [1]. The following are some major effects of scientific misconduct:

Damage to scientific integrity: Scientific research is compromised by scientific misconduct, which undermines its integrity and credibility. It weakens the scientific method and the foundation of knowledge, which are underpinned by the precise reporting of data and findings. Instances of misconduct

result in a decline in confidence in scientific discoveries, as it undermines the reliability of research findings [12].

Harm to public trust: The public's confidence in science and scientists may be damaged by scientific misconduct. The public's view, policy choices, and financing for scientific endeavours may all suffer when wrongdoing is revealed or suspected since it can breed scepticism towards scientific research. For scientific information to be accepted and used to solve social issues, public trust must be maintained [13].

Misdirection of resources: Resources may be misallocated as a consequence of misconduct in scientific research. Other researchers may devote time, energy, and resources to following lines of inquiry based on inaccurate or manufactured data when study results that are deceptive or untrue are publicised. This may impede scientific advancement and squander money that might have been used for more productive research directions [14].

2 Literature Review

(Armond et al., 2024) [15] Any violations of research integrity in the biomedical sciences have the potential to have a cascading effect on patient care, medical treatments, and the wider application of healthcare legislation. In order to address these breaches, steps including strict research procedures, open reporting, and a shift in the research culture are needed. Fostering a culture of research integrity requires institutional support in the form of mentoring, thorough training, and explicit rules. However, research behaviour is significantly influenced by institutional and structural elements, such as recognition programs and research incentives. In order to preserve public confidence in the scientific community and guarantee the validity of knowledge, preserving research integrity requires a team effort from all parties involved. Here, we go over a few definitions and guiding concepts, their significance for the biomedical sciences, and practical measures that may be taken to promote research integrity.

(Alam, 2024) [16] The academic publisher's role in screening, protecting, and examining information before and after publication has been solidifying into a fundamental publisher skill set in an age of growing concerns about research integrity that are changing in scope and form. A crucial step in resolving the issues is investing in tools and training, but improved cooperation between players from different industries is also required. In order to fully understand post-publication notices (such as retractions) and make informed decisions about which published content should be used as a foundation for future research as well as the advancement of guidelines and policies, "consumers" of published scholarly content must also be made aware of the trends in research integrity and publishing ethics misconduct.

(Chen et al., 2024) [17] emphasises the necessity for the academic community to enhance researcher qualifications, strengthen ethical norms, and establish rigorous review mechanisms in order to resolve these challenges. Mandatory AI ethics and integrity training for researchers is being implemented with the objective of promoting ethical research practices and nurturing a comprehensive understanding of potential AI misuses. Development of unified ethical standards for AI in research and the exchange of

best practices through the establishment of international collaboration frameworks. These recommendations are urgently required for the scientific community to consider and take action, as protecting research integrity is essential for preserving public trust in science.

(Francesca et al., 2024) [18] a study to evaluate the efficacy of a training course on RI by mapping the attitudes of early-career researchers on this topic through a questionnaire that was constructed using the revised version of the Scientific Misconduct Questionnaire and administered to all participants at the commencement and conclusion of the course. There is consensus among early-career researchers regarding the significance of sharing any ethical concerns that may arise in research with their colleagues and superiors, as well as establishing a work environment that promotes RI awareness. Overall, the findings indicate that the course is effective. Early-career researchers should be provided with research methodology, integrity, and ethical consultation services, in addition to RI training, by their institutions. In order to cultivate effective practices that are consistent with the principles of RI, senior scientists should encourage engagement in peer-to-peer dialogue and incorporate RI into their research practices.

(Khot et al., 2024) [19] According to a study of scientists who get funding from the National Institutes of Health (NIH), there are at least 2325 instances of scientific misconduct annually. Therefore, this study was conducted to ascertain the knowledge, attitude, and practices (KAPs) of scientific misconduct and research integrity among postgraduate students and teachers employed by medical institutions in Central India (CI) and North Karnataka (NK). This study emphasises how academic culture shapes ethical research practices and the need for better education and policy implementation to maintain research integrity in medical institutions.

(Nguyen & Tuamsuk, 2024) [20] Investigate the factors that influence the scientific integrity of scholarly publishing among researchers in Thailand. The results confirm that there are five factors that influence scientific integrity in scholarly publishing: university/faculty requirements/policies, university support, publishers' aspects, aspects of publishing, and researcher-related factors. It is clearly evident that the highest factor loading values are achieved by establishing a process and criteria for authorship agreement and verification, as well as dedicating offices or divisions within the university to address research integrity concerns and provide support to researchers. The findings guarantee that researchers affiliated with prestigious research universities in Thailand prioritise scientific integrity. It is advised that universities prioritise initiatives that are designed to cultivate scientific integrity and increase the ethical awareness of researchers in order to address this challenge.

(Rao et al., 2024) [21] p-hacking, which involves the misuse of another individual's research results or ideas without appropriate attribution, is a potential activity that researchers may engage in. In the context of research, conflict of interest (COI) arises when an individual's personal, financial, or professional interests have the potential to influence their judgement or actions. The propagation of deceptive or misleading information can result from hypotheses that are made after the results are evident. Researchers should be forthcoming with their methodologies and their discoveries should be reported with precision and honesty. Clear and rigorous policies regarding scientific misconduct ought to be implemented by research institutions. This knowledge must be disseminated to ensure that researchers

and readers comprehend which statistical analysis and reporting methods constitute scientific misconduct.

(Skarbek, 2024) [22] In the context of the role that legislators can play in combating this practice, the article addresses the issue of fabrication and falsification of scientific research. The article presents the findings of a survey that polled 70 Polish academicians regarding their perspectives on the role of legislators in preventing the fabrication and falsification of research. For instance, the results indicate that the majority of respondents (81%) advocate for disciplinary accountability for malfeasance of this nature. Additionally, they believe that legislators should combat this practice through "soft" measures, such as the promotion of research ethics codes (70%). The criminalisation of such conduct was desired by 50% of the respondents. The Polish legislator is not effective in combating such malfeasance, according to nearly half of the respondents.

(Elali & Rachid, 2023) [23] One's reputation is damaged and honest writers are undermined when research is falsified within the scientific community. Show that utilising a chatbot with an AI-based language model to fabricate research is feasible. We will evaluate the accuracy of detecting manufactured works using AI and human detection. There will be an emphasis on the dangers of using research produced by artificial intelligence as well as the reasons why research may be fabricated.

(Zhaksylyk et al., 2023) [24] Adherence to the most stringent ethical standards is mandatory for researchers. Research institutions are responsible for fostering an environment that promotes integrity principles and offers researchers valuable guidance, instruction, and support. The dissemination of research results through publishing is facilitated by editors and reviewers, who serve as protectors by maintaining ethical standards and standards of quality. The ongoing and multifaceted battle against scientific malfeasance is a continuous activity. It necessitates a collaborative endeavour and upholding the principles of rigorous science, transparency, and honesty. The scientific community may protect its fundamental principles and continue to make a meaningful contribution to the welfare of society by fostering a culture of RI. It serves as a foundation for future scientific advancements and augments current research.

3 Conclusion

In conclusion, ensuring research integrity in the digital age requires a proactive, multifaceted approach to address growing concerns such as plagiarism, fabrication, and falsification—now further amplified by AI technologies. The ease of producing fabricated content, lack of robust AI-detection tools, and academic hyper-competitiveness create opportunities for research misconduct, potentially influencing critical domains like healthcare policy and scientific standards. Motivations range from career advancement to financial gain, making it imperative for all stakeholders—researchers, institutions, funders, and publishers—to uphold ethical responsibilities. Misconduct, including data falsification, p-hacking, and failure to disclose conflicts of interest, can lead to false scientific conclusions, damaged reputations, and resource waste. Strengthening ethical standards through transparent research practices, continuous education, CME workshops, and responsible conduct training is essential. Institutions must

enforce strict policies, peer-review protocols, and foster collaboration among stakeholders to build a culture of trust and accountability. As AI becomes more integrated into research workflows, enhancing technical capabilities and investigative skills, while promoting open dialogue and resource sharing, is vital to safeguarding the credibility and reliability of scholarly communication. Only through collective vigilance and commitment can we ensure that published research remains a trusted source of knowledge and progress.

References

[1]. K. K. Lal and B. Sharma, "Research Integrity & Ethics: Scientific Misconduct," Academic, no. September, 2023.

[2]. K. R, "Research and publication-integrity and ethics," J. Dent. Res. Rev., vol. 212, no. 2, pp. 383–385, 2014, doi: 10.1016/j.atherosclerosis.2010.01.050.

[3]. M. A. Deshmukh, A. S. Dodamani, M. R. Khairnar, and R. G. Naik, "Research misconduct: A neglected plague," Indian J. Public Health, vol. 61, no. 1, pp. 33–36, 2017, doi: 10.4103/0019-557X.200255.

[4]. M. Khadem-Rezaiyan and M. Dadgarmoghaddam, "Research misconduct: A report from a developing country," Iran. J. Public Health, vol. 46, no. 10, pp. 1374–1378, 2017.

[5]. S. A. Z. Zaidi, E. Ahmad, and N. Shukla, "Ethical Considerations in the Use of Artificial Intelligence (AI) for Education and Research : A Review," Int. J. Innov. Sci. Eng. Manag., pp. 156–167, 2024, doi: 10.69968/ijisem.2024v3si2156-167.

[6]. A. Mousa et al., "Research Integrity in Guidelines and evIDence synthesis (RIGID): a framework for assessing research integrity in guideline development and evidence synthesis," eClinicalMedicine, vol. 74, p. 102717, 2024, doi: 10.1016/j.eclinm.2024.102717.

[7]. R. A. Feenstra, E. Delgado López-Cózar, and D. Pallarés-Domínguez, "Research Misconduct in the Fields of Ethics and Philosophy: Researchers' Perceptions in Spain," Sci. Eng. Ethics, vol. 27, no. 1, pp. 1–21, 2021, doi: 10.1007/s11948-021-00278-w.

[8]. A. Muthanna, Y. Chaaban, and S. Qadhi, "A model of the interrelationship between research ethics and research integrity," Int. J. Qual. Stud. Health Well-being, vol. 19, no. 1, 2024, doi: 10.1080/17482631.2023.2295151.

[9]. A. A. Sanni and S. M. Enefu, "Research Misconduct (fabrication, falsification, plagiarism etc.)/ Latest Bibliography and Proper in Bibliography in research work Practicum or workshop if any," Res. gate, no. July 2020, 2019.

[10]. C. Chou, I. J. Lee, and J. Fudano, "The present situation of and challenges in research ethics and integrity promotion: Experiences in East Asia," Account. Res., vol. 31, no. 6, pp. 576–599, 2024, doi: 10.1080/08989621.2022.2155144.

[11]. L. M. Bouter, J. Tijdink, N. Axelsen, B. C. Martinson, and G. ter Riet, "Ranking major and minor research misbehaviors: results from a survey among participants of four World Conferences on Research Integrity," Res. Integr. Peer Rev., vol. 1, no. 1, pp. 1–8, 2016, doi: 10.1186/s41073-016-0024-5.

[12]. R. Roje, A. Reyes Elizondo, W. Kaltenbrunner, I. Buljan, and A. Marušić, “Factors influencing the promotion and implementation of research integrity in research performing and research funding organizations: A scoping review,” Account. Res., vol. 30, no. 8, pp. 633–671, 2023, doi: 10.1080/08989621.2022.2073819.

[13]. N. Allum et al., “Researchers on research integrity: a survey of European and American researchers,” F1000Research, vol. 12, p. 187, 2023, doi: 10.12688/f1000research.128733.1.

[14]. Y. Xie, K. Wang, and Y. Kong, “Prevalence of Research Misconduct and Questionable Research Practices: A Systematic Review and Meta-Analysis,” Sci. Eng. Ethics, vol. 27, no. 4, p. 41, 2021, doi: 10.1007/s11948-021-00314-9.

[15]. A. C. V. Armond, K. D. Cobey, and D. Moher, “Key concepts in clinical epidemiology: research integrity definitions and challenges,” J. Clin. Epidemiol, vol. 171, p. 111367, 2024, doi: 10.1016/j.jclinepi.2024.111367.

[16]. S. Alam, “Trends in research integrity concerns and the evolving role of the publisher,” Insights UKSG J., vol. 37, 2024, doi: 10.1629/uksg.663.

[17]. Z. Chen et al., “Research integrity in the era of artificial intelligence: Challenges and responses,” Med. (United States), vol. 103, no. 27, p. e38811, 2024, doi: 10.1097/MD.0000000000038811.

[18]. G. Francesca, S. Ceruti, S. Martini, M. Picozzi, M. Cosentino, and F. Marino, “Educating and Training in Research Integrity (RI): A Study on the Perceptions and Experiences of Early Career Researchers Attending an Institutional RI Course,” J. Acad. Ethics, vol. 22, no. 3, pp. 413–430, 2024, doi: 10.1007/s10805-023-09497-1.

[19]. A. Khot, C. A. Chindhalore, and A. Naikwadi, “Knowledge, Attitude, and Practices About Research Integrity and Scientific Misconduct Among the Faculty and Medical Postgraduates Working in Medical Colleges in North Karnataka and Central India: A Cross-Sectional Online Survey,” Cureus, vol. 16, no. 4, 2024, doi: 10.7759/cureus.59200.

[20]. L. T. Nguyen and K. Tuamsuk, “Factors influencing researchers’ scientific integrity in scholarly publishing: a path analysis approach,” Res. Ethics, 2024, doi: 10.1177/17470161241257445.

[21]. K. N. Rao, M. Mair, R. D. Arora, P. Dange, and N. M. Nagarkar, “Misconducts in research and methods to uphold research integrity,” Indian J. Cancer, vol. 55, no. 1, pp. 382–389, 2024, doi: 10.4103/ijc.IJC.

[22]. O. Skarbek, “Fabrication and Falsification of Scientific Research – a Challenge for Legislators or an Irrelevant Issue?” Kryt. Prawa, vol. 16, no. 1, pp. 200–212, 2024, doi: 10.7206/kp.2080-1084.666.

[23]. F. R. Elali and L. N. Rachid, “AI-generated research paper fabrication and plagiarism in the scientific community,” Patterns, vol. 4, no. 3, p. 100706, 2023, doi: 10.1016/j.patter.2023.100706.

[24]. A. Zhaksylyk, O. Zimba, M. Yessirkepov, and B. F. Kocyigit, “Research Integrity: Where We Are and Where We Are Heading,” J. Korean Med. Sci., vol. 38, no. 47, pp. 1–11, 2023, doi: 10.3346/jkms.2023.38.e405.