

## SUBMISSION

Submission to the Tertiary Education Quality and Standards Agency (TEQSA)

# Submission to the Academic and Research Integrity Guidance Note consultation

23 August 2023

**The Australian Academy of Technological Sciences and Engineering (ATSE) is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.**

Safeguarding academic and research integrity is becoming increasingly important. Traditional concerns such as plagiarism and data fabrication persist, while newer challenges, such as artificial intelligence (AI) generated content and deepfakes, demand attention. Appropriate policy frameworks and training enable students and researchers to adhere to ethical principles, honesty and accuracy in their work. The Tertiary Education Quality and Standards Agency's (TEQSA) current consultation to develop a Guidance Note on Academic and Research Integrity provides an opportunity to promote best practices to maintain the credibility and trustworthiness of educational institutions and research findings. ATSE makes the following recommendations for inclusion in TEQSA's Guidance Note on Academic and Research Integrity:

**Recommendation 1:** Provide guidance on open science principles to improve research integrity.

**Recommendation 2:** Highlight the importance of guidelines and research training for integrity in interdisciplinary research.

**Recommendation 3:** Provide universities with guidance on research integrity for citizen science.

**Recommendation 4:** Recommend universities collaborate with Aboriginal and Torres Strait Islander and other Indigenous leaders in developing protocols for research involving Traditional Knowledge, ensuring respectful and proper partnership, acknowledgment and recognition.

**Recommendation 5:** Provide guidance for higher education providers to respond to the misuse of generative AI for research and coursework.

**Recommendation 6:** Encourage higher education institutions to proactively manage risks around cybersecurity, including as it pertains to academic integrity.

### **Promoting open science for research integrity**

Research integrity requires conducting and reporting research in accordance with accepted professional standards and norms, including accuracy, honesty, and adherence to ethical principles. The reproducibility, integrity, and quality of research are crucial in upholding good scientific practices and maintaining public trust in research outcomes. Recently discussions around reproducibility have arisen when scientists have reported difficulty in replicating experimental results (Baker, 2016; Flier, 2022). In 2016, Nature conducted a survey of 1576 researchers, of which 70% reported trying and failing to reproduce another scientist's work, and more than half reported failing to reproduce their own experiments (Baker, 2016). Factors contributing to irreproducibility can include inadequate researcher training in experimental design and methodology, bias, replication, statistical analysis, and difficulties in duplicating medical techniques (Diaba-Nuhoho & Amponsah-Offeh, 2021). Variability in chemicals and reagents, particularly in experiments involving materials such as antibodies, are also significant contributors. Of concern are contributing factors such as time constraints, pressure to publish in high-impact journals, and insufficient supervision and mentorship; these lead to questionable research practices and undermine public trust in science (Collins & Tabak, 2014). Embracing open science practices, such as openly sharing detailed methodologies and data, can mitigate these challenges by fostering transparency and allowing researchers to independently validate and replicate findings. This enhances the credibility and reliability of research outcomes. For areas where regulated access is more appropriate, such as access to Indigenous data and access to sensitive public data, or defence data, the FAIR Guiding Principles (data that is Findable, Accessible, Interoperable and Reusable) offer a more feasible option (Wilkinson et al., 2016).

To address these challenges, ATSE recommends that the Guidance Note encourages researchers to adopt a more open approach by sharing ideas, methods, software, data pipelines, and data with colleagues and the public. Establishing and maintaining data repositories for published papers as well as raw data promotes transparency and contributes to research integrity. TEQSA's Guidance Note should also highlight the role of research training in research integrity. Research group leaders and supervisors must provide adequate support and training to postgraduate students and early career researchers to foster sound experimental design from the outset. Emphasising careful planning, design, and execution of research, along with appropriate experimental methods and statistical analysis, is essential for achieving reproducible outcomes.

**Recommendation 1:** Provide guidance on open science principles to improve research integrity.

## Advancing research integrity for interdisciplinary research and citizen science

Interdisciplinary research and collaboration are essential for driving innovation and solving complex global challenges. Constant improvement in the quality and culture within the research community will always be important to maintain integrity (Office of the Chief Scientist, 2023). Academics and collaborators from industry and government may encounter differences in institutional processes and goals (Ingstrup et al., 2021). Similarly, interdisciplinary research can raise research integrity issues due to misalignment in research methodologies. The Guidance Note should highlight the need for research training on the ethical complexities that may arise in interdisciplinary collaborations, while embracing diverse perspectives, research methodologies and knowledge systems.

The Guidance Note should also consider research integrity implications for citizen science, a prevalent approach in a growing number of research fields. It includes a wide range of types of projects in which citizens not only are research subjects but actively contribute as co-researchers such as by collecting environmental data in their communities and contributing medical data to research projects (Ozolinčiūtė et al., 2022). It is expected within the academic community that anyone involved in research should uphold the fundamental values of academic integrity. There are guidelines dedicated to studies involving humans as research subjects such as the [National Statement on Ethical Conduct in Human Research](#) (NHMRC, 2023); however, there is a paucity of guidance on how to conduct research with citizens as co-researchers (Ozolinčiūtė et al., 2022). In citizen science, participants might not fully understand the ethical implications of their contributions. This could lead to unintentional breaches of privacy, inadequate consent procedures, or the collection and storage of sensitive data without proper safeguards. TEQSA's Guidance Note should recommend universities establish clear guidelines, provide proper training for both researchers and citizen scientists, implement quality control measures, ensure ethical standards are maintained, and carefully evaluate the integration of citizen science into research programs.

**Recommendation 2:** Highlight the importance of guidelines and research training for integrity in interdisciplinary research.

**Recommendation 3:** Provide universities with guidance on research integrity for citizen science.

## Promoting integrity for research with Indigenous communities and knowledge

Responsible research should seek to avoid biases, harm and exploitation. TEQSA's Guidance Note has the opportunity to contribute to building a more inclusive and culturally respectful research ecosystem. This is critical to enable inclusive research methodologies and prevent generalisation of results to underrepresented groups where this is not appropriate.

In our [Reconciliation Action Plan](#), ATSE acknowledges that Western applied science, technology and engineering have historically caused damage to Aboriginal and Torres Strait Islander peoples, cultures and Country, with some harms continuing to this day (ATSE, 2022). It is crucial to acknowledge and respect cultural practices and Traditional Knowledge, including in the context of research. ATSE recommends that the Guidance Note addresses research integrity as it applies to using Traditional Knowledge and working with Aboriginal and Torres Strait Islander people. This includes Aboriginal and Torres Strait Islander people owning intellectual property rights to their Traditional Knowledge when it is used in research (Heckenberg, 2018). The Guidance Note should discuss policies, procedures and research training for working with Traditional Knowledge and Aboriginal and Torres Strait Islander people, as well as any other Indigenous populations in international research. These policies and procedures should be developed in consultation with Aboriginal and Torres Strait Islander researchers and communities. This approach not only ensures that research respects the rights and interests of Indigenous communities but also empowers researchers with the competency to include diverse perspectives and knowledge systems in their work.

**Recommendation 4:** Recommend universities collaborate with Aboriginal and Torres Strait Islander and other Indigenous leaders in developing protocols for research involving Traditional Knowledge, ensuring respectful and proper partnership, acknowledgment and recognition.

## Addressing AI challenges and trends in academic and research integrity

There is a need for principles and regulations to guard against the misuse of generative AI in an academic and research context. ATSE welcomes [TEQSA's submission to the inquiry into the use of generative AI in the education system](#) (TEQSA, 2023). Generative AI's ability to output convincing content, including deepfakes (realistic audio, video and images), and quickly analyse vast quantities of data poses risks of academic misconduct, fake research outputs, and dissemination of false information (Bond, 2023; Currie, 2023). AI ghostwriting undermines the transparency and authorship integrity of academic work (Currie,

2023). As Australia's Chief Scientist, Dr Cathy Foley AO PSM FTSE FAA has stressed, Australian institutions have entered an era of declining trust (Office of the Chief Scientist, 2023). At the core of these issues, reputational damage to institutions, professions and the sector, and public safety is at risk. It is crucial to implement preventive measures.

ATSE supports responsible AI use and believes a framework must be in place for its ethical application, including in educational settings ([ATSE, 2023](#)). Emphasising integrity in the context of technological advancements is crucial, and ethical considerations surrounding AI usage must be highlighted ([ATSE, 2023](#)). TEQSA's Guidance Note must emphasise the responsibility of the higher education sector to uphold trust through transparency and accountability for how AI is used and disclosed, as well as countermeasures to detect AI-generated coursework. For example, audits can verify data authenticity in research and submitted coursework, and detect potential biases introduced by AI algorithms in learning and teaching. Future AI technology developments may necessitate regular revisions to TEQSA's Guidance Note. With the right frameworks in place in higher education providers, these advancements in technology can enhance, rather than compromise, academic and research integrity.

**Recommendation 5:** Provide guidance for higher education providers to respond to the misuse of generative AI for research and coursework.

### **Managing cybersecurity risks to support academic and research integrity**

Considering the increasing reliance on digital technologies in research and academia, TEQSA should outline higher education institutions' need for enhanced cybersecurity measures to safeguard intellectual property, sensitive research data, administrative systems, and student and faculty information. This pertains to research integrity in that there is an obligation to secure personal or sensitive data collected from research participants. While an open science approach can promote a culture of research integrity, it is important that personal data be kept safe. Integrating FAIR with CARE Principles (Collective benefit, Authority to control, Responsibility and Ethics) would also allow regulated access while respecting people's rights and interests.

Higher education institutions are now at risk of facing legal consequences and financial penalties for mishandling sensitive data or failing to protect personal information (Office of the Australian Information Commissioner, 2023). This is especially important in the context of increasing cyberattacks in the Asia-Pacific region (Thales, 2022). ATSE believes TEQSA's Guidance Note should underscore the importance of protecting sensitive information by implementing strong access controls, encryption, and secure data storage practices. Regular data backups and secure data handling practices should be emphasised to mitigate the impact of data loss or breaches.

TEQSA's Guidance Note should recommend clear protocols for how researchers and higher education providers should be handling digital sources and data, including specific procedures for collection, storage, analysis, and sharing. At the same time, providers must ensure that the technologies they use are not facilitating academic misconduct. Inadequate authentication processes for online assessments can lead to identity fraud and academic dishonesty, compromising research integrity. Implementing Multi-Factor Authentication (MFA) for online assessments is essential to prevent this. Adopting secure online assessment platforms with robust encryption and monitoring mechanisms is also encouraged.

**Recommendation 6:** Promote higher education institutions to proactively manage risks around cybersecurity, including as it pertains to academic integrity.

*ATSE thanks the Tertiary Education Quality and Standards Agency (TEQSA) for the opportunity to respond to the consultation on Academic and Research Integrity Guidance Note. For further information, please contact [academypolicyteam@atse.org.au](mailto:academypolicyteam@atse.org.au).*

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