



In the interests of science: Jointly promoting research integrity is the cornerstone

1. Introduction

We are all familiar with the word “integrity” and have some common understanding of it. It is generally accepted that honesty and reliability are two important aspects of integrity. Specific to scientific research, what is research integrity? Why does it matter? Is it just the responsibility of researchers themselves or a shared responsibility of the entire research community?

Clarification of the concept can give us a clearer understanding of how research integrity comes about and help us to have a better idea of the ways in which it can be fostered. “‘Research integrity’ refers to the principles and standards that have the purpose to ensure validity and trustworthiness of research [1].” It is not just about avoidance of misconduct, but interlinked with morality [2]. The World Conferences on Research Integrity Foundation (WCRIF) proposed that honesty, accountability, professional courtesy, fairness, and good stewardship are the hallmarks of research integrity [1]. The Singapore Statement on Research Integrity presented four principles and 14 responsibilities as a global guide to the responsible conduct of research in 2010. The statement emphasizes that honesty, accountability, professional courtesy and fairness, and good stewardship are fundamental to the integrity of research wherever it is undertaken [3]. The Montreal Statement on Research Integrity in Cross-Boundary Research Collaborations in 2013 elaborated four general collaborative responsibilities, seven responsibilities in managing the collaboration, four responsibilities in collaborative relationships, and five responsibilities for outcomes of research [4]. In the 5th World Conference on Research Integrity in Amsterdam, 2017, four agenda items were proposed to assure that research is undertaken in accordance with the Singapore Statement [5]. Five principles were presented in the Hong Kong Principles (2019), which show “a specific focus on the need to drive research improvement through ensuring that researchers are explicitly recognized and rewarded for behaviors that strengthen research integrity [6].”

Science is a basic component of human knowledge infrastructure and its foundation is publication. The International Science Council (ISC) proposed that modern systems of scientific and scholarly publishing serve “the interests of science [7].” According to the theory of interest, the interests of science can be divided into subjective and objective aspects. The subjective aspect is its satisfaction to the subject, and the objective aspect is the scientific interest itself. ISC takes science as a global public good. “The knowledge that has been accumulated since the earliest days of scientific practice is continually refreshed, renewed and re-evaluated by new experiments, new observations and new theoretical insights, and publicly communicated in the published record of science [7].” We lay great stress on research integrity because validity and

credibility of research show significant importance to the interests of science. “If one falsifies data one not only harms scientific truth but also treats other researchers unfairly [8].” That is why we need honesty and trustworthiness in research. It is the way to ensure scientific continuity and sustainable development. In other words, to advance the research integrity is to advance the interests of science.

Literature discusses research integrity from various perspectives, including but not limited to the concept of research integrity [2,8], the relationship between research integrity and research supervision and education [9], and strategies to promote research integrity [2,10]. Most literature shows a consensus that scientific integrity is a shared responsibility of all parties in the research community. Different opinions exist over who should shoulder the main responsibility. Abdulghani Muthanna and Ahmed Alduais assert that more responsibility falls onto the shoulders of instructors and supervisors [9]. According to The World Conference on Research Integrity Foundation, “While research integrity applies to all parties in the research endeavour, it most importantly relies on the conduct of researchers [1].” The latter is aligned with our belief that researchers play a central role in maintaining research integrity, while other parties of the research community play important roles of education and supervision in their respective fields. The former is self-discipline that requires researchers to obey their inner moral law, and the latter is heteronomy constructed by institutional norms. We argue that the unity of self-discipline and heteronomy can better foster research integrity.

2. Discussion

2.1. First CQU Webinar on Research Integrity

Universities play an important role in cultivating students and junior researchers. In order to implement the spirit of the Central Government’s “Several Opinions on Further Strengthening the Construction of Scientific Research Integrity” and other related documents, to create a good research environment conducive to innovation and creativity, and build a healthy academic ecology of honesty and trustworthiness, Chongqing University held the first International Seminar on Research Integrity in the afternoon of September 7, 2021. This was also broadcast live worldwide in both Chinese and English.

The seminar focused on “Research Education: Tying the First Button for Students’ Research”, aiming to integrate the frontier of research integrity in the world to strengthen education and publicity on research integrity. It will help teachers, students and researchers in colleges and universities familiarize themselves with the specific requirements for research integrity, provide guidance to consciously resist academic

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misconduct and carry out responsible scientific research. In the future, Chongqing University will continue to hold more international seminars on research integrity, strengthen research integrity education and publicity, cooperate to carry out research on new issues in building research integrity and contribute to building a healthy and sustainable academic ecology.

2.2. Views from researchers and editors

Prof. Yuehong (Helen) Zhang, Dr. Nandita Quaderi and Dr. Elisabeth Bik were invited to give academic talks in the First CQU Webinar on Research Integrity. From the perspectives of scientists and journal editors, they discussed open science and research integrity, shared thoughts on creating an academic ecology to identify misconduct in research integrity, proposed initiatives to deal with academic misconduct and called on the whole community to fulfill their responsibilities and play a more active role in building research integrity.

Prof. Zhang issued a report entitled “What should be our next steps to move forward in support of truth and integrity?”. She presented that open science brings greater transparency, which can promote research integrity. She shared steps and practices carried out worldwide. As a senior editor, she supported a journal's publication of identification of mistakes and errors. Her research team proposed a new index, the “Academic Integrity Awareness Index” for future discussions across the linked spheres of publishing and research [11].

Dr. Quaderi is Editor-in-Chief and Editorial VP of Web of Science. She believed that research integrity is a shared responsibility and gave a report on “Research Integrity: Understanding our shared responsibility for a sustainable scholarly ecosystem” to stress the role Web of Science plays in the process. According to the ISI research integrity report, research should be conducted with integrity, meaning that it is trustworthy, honest and ethical. The report explains that research integrity can be undermined in different stages of the research process. “There are many stakeholders responsible for upholding research integrity and there is no single group that can fix failures in research integrity.” Dr. Quaderi called on all parties, including researchers, publishers, institutions, funders, database and metrics providers, to take different countermeasures to identify and tackle problems of misconduct. The Web of Science has been committed to maintaining research integrity and providing data and metrics you can trust by strictly selecting high quality journals, increasing diligence against “hijacked” journals, and flagging journals under investigation for quality concerns. It launched Web of Science Academy in March 2021, providing free, online training for the research community [12].

Dr. Bik focused on “The Dark Side of Science: Misconduct in Scientific Research”. She emphasized that science publications are like bricks in a wall to build the science building. Papers containing errors or fraudulent data might cause a waste of time and money because of failures in replicating those results. She detected misconduct in papers from the perspective of research images that are unique and classified image duplication into three types: simple, repositioned, and altered. 800 of

20,621 papers (4%) with duplicated figures were found. Even though some of them are honest errors, 2% are intentional. “Science misconduct is damaging for scientists, but also for science itself.” Dr. Bik gave suggestions on how to avoid misconduct for professors and group leaders from the perspective of research education, and for journal editors and publishers being the gate-keepers of science publications [13].

3. Conclusion

In the words of Immanuel Kant, “Two things fill the mind with ever new and increasing admiration and awe, the oftener and the more steadily we reflect on them: the starry heavens above and the moral law within [14].” We believe that reflection on the moral law in mind will guide all parties to take responsibilities and take actions to uphold research integrity. All parties should always on the path of maintaining the interests of science.

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