



OPEN ACCESS

EDITED BY
Federica Murmura,
University of Urbino Carlo Bo, Italy

REVIEWED BY
Yusuke Kishita,
The University of Tokyo, Japan

*CORRESPONDENCE
Tomohiko Sakao
✉ tomohiko.sakao@liu.se

SPECIALTY SECTION
This article was submitted to
Sustainable Organizations,
a section of the journal
Frontiers in Sustainability

RECEIVED 20 January 2023
ACCEPTED 20 February 2023
PUBLISHED 09 March 2023

CITATION
Sakao T, Desha C, Djekic I, Favi C, Olayide OE,
Ziolo M, Kantola J, Muñoz-Torres MJ, Tortato U,
Segalas J, Urbaniec K,
Santibanez-González EDR, Renzi MF, Seuring S
and Lozano R (2023) Scoping good papers for
organizations' sustainability in management
and engineering research.
Front. Sustain. 4:1148499.
doi: 10.3389/frsus.2023.1148499

COPYRIGHT
© 2023 Sakao, Desha, Djekic, Favi, Olayide,
Ziolo, Kantola, Muñoz-Torres, Tortato, Segalas,
Urbaniec, Santibanez-González, Renzi, Seuring
and Lozano. This is an open-access article
distributed under the terms of the [Creative
Commons Attribution License \(CC BY\)](#). The use,
distribution or reproduction in other forums is
permitted, provided the original author(s) and
the copyright owner(s) are credited and that
the original publication in this journal is cited, in
accordance with accepted academic practice.
No use, distribution or reproduction is
permitted which does not comply with these
terms.

Scoping good papers for organizations' sustainability in management and engineering research

Tomohiko Sakao^{1*}, Cheryl Desha², Ilija Djekic³, Claudio Favi⁴,
Olawale Emmanuel Olayide⁵, Magdalena Ziolo⁶, Jussi Kantola⁷,
María Jesús Muñoz-Torres⁸, Ubiratã Tortato⁹, Jordi Segalas¹⁰,
Krzysztof Urbaniec¹¹, Ernesto D. R. Santibanez-González¹²,
Maria Francesca Renzi¹³, Stefan Seuring¹⁴ and Rodrigo Lozano¹⁵

¹Division of Environmental Technology and Management, Department of Management and Engineering, Linköping University, Linköping, Sweden, ²School of Engineering and Built Environment, Cities Research Institute, Griffith University, Nathan, QLD, Australia, ³Faculty of Agriculture, University of Belgrade, Belgrade, Serbia, ⁴Department of Engineering and Architecture, Università di Parma, Parma, Italy, ⁵Department of Sustainability Studies, Faculty of Multidisciplinary Studies, University of Ibadan, Ibadan, Nigeria, ⁶Division of Economics, Finance and Management, Department of Sustainable Finance and Capital Markets, University of Szczecin, Szczecin, Poland, ⁷Department of Mechanical and Materials Engineering, University of Turku, Turku, Finland, ⁸Department of Finance and Accounting, Universitat Jaume I, Castelló de La Plana, Spain, ⁹Business and Polytechnic School, Pontifical Catholic University of Parana, Curitiba, Brazil, ¹⁰University Research Institute for Sustainability Science and Technology, Universitat Politècnica de Catalunya, Barcelona, Spain, ¹¹Faculty of Civil Engineering, Mechanics and Petrochemistry, Warsaw University of Technology, Plock, Poland, ¹²Department of Industrial Engineering, Faculty of Engineering, University of Talca, Curico, Chile, ¹³Department of Business Studies, University of Roma Tre, Rome, Italy, ¹⁴Supply Chain Management, Faculty of Business and Economics, University of Kassel, Kassel, Germany, ¹⁵Faculty of Engineering and Sustainable Development, University of Gävle, Gävle, Sweden

KEYWORDS

trans-disciplinary research, research quality, research impact, publish or perish, principle, rigor-or-relevance dilemma, deductive, inductive

1. Global trends in publishing research

“Publish or perish” is a well-known aphorism in academia (Rawat and Meena, 2014). However, this mantra has often led to excessive pressure to publish increasing numbers of manuscripts without commensurate care for quality (Harvey, 2020; Kozlov, 2023). Such pressure has been associated with evaluation systems that push researchers to focus on various scientometrics indicators, such as publishing in journals of high “impact factor” and working to increase personal h-index points. It is also compounded by the publishing sector's profit-seeking enterprises that have spanned increasing the number of volumes and special issues each year, reducing reviewer and revision timeframes, and incentivizing pay-for-publishing arrangements (Taylor, 2012; Larivière et al., 2015; Tsui and McKiernan, 2022).

We observe that these pressures are not generally congruent with the academic sector's desire for writing that makes a difference. In the current publishing environment, published papers may even show findings that are false, questionable or impossible to replicate (Ioannidis, 2005; Gopalakrishna et al., 2022), including the domain of the authors of this opinion piece (Kirchherr, 2022). Each author's responsibility is also raised as an issue recently calling for attention (Biagioli, 2022; Tsui and McKiernan, 2022). In our community of practice, some publications have provided wisdom and useful guidance for high-quality research and publication (for example, Norström et al., 2020; Bergmann et al., 2021). However, specific support needs to be included in the domains of management and engineering, as well as at the intersection of the two, which is increasingly important for sustainability research (compare, e.g., a seminal paper by Whetten, 1989 in management).

As a community of editorial reviewers for *Frontiers in Sustainability*, this opinion piece presents our expectations for authors who would like to publish in a scientific journal about organizations' sustainability.¹

2. Specificity of research for organizations' sustainability

Research for organizations' sustainability is expected to focus on a problem defined in a real-world context and contribute to making a positive change, in a timely manner at a large scale, through improved product/service design, management, business models, economy and finance, governance, human resources, stakeholders, user behavior, leadership, technologies, culture, and operations, whilst considering impacts on materials and energy use. Changes in organizations' sustainability are highly complex (Lozano, 2018) and necessitate trans-disciplinary research (Lozano, 2006; Sakao and Brambila-Macias, 2018). Advances in theory and practice are now both regarded as essential; recall "nothing is quite so practical as a good theory" (Van de Ven, 1989) and compare with the rigor-or-relevance dilemma by Schön (1983).

3. Addressing management and engineering research needs

In conducting research related to multiple disciplines, it is important to be aware of the differences in terms of research objects and processes on top of terminologies. Considering management and engineering, as an example, a spectrum between the two is assumed to exist regarding the research reality, as illustrated in Figure 1.

4. Five principles of good papers for organizations' sustainability

We, based on Sections 2 and 3, propose that high-quality research papers for organizations' sustainability imbue all the five principles in Box 1, regardless of the disciplines. Each of these principles is explained below, applying across the spectrum of research journeys. Acknowledging that a paper might contribute primarily to theory or practice depending on the research phase as well as the materials and methods chosen (Seuring et al., 2021), this should be indicated for each paper.

4.1. Contribute to theory

This principle means that novelty is highlighted—and a gap is filled—in the existing body of knowledge. A high-quality paper contributes *meaningful* scientific knowledge, containing a

1 Note that basic features expected regardless of the discipline, for example, logical flow, appropriate structure, clear presentation and good language, are outside of the scope of this paper.

"least publishable unit" in a scientific sense.² As research for organizations' sustainability demands trans-disciplinary knowledge (Section 2), a good paper should be clear about its contributions to the related disciplines as addressed by Section 3 in the case of engineering and management.

We discourage papers that only apply *existing, known* theories to a case in practice by showing non-surprising results since this is more typical for consultancy reports and could be termed "academic reports." Unfortunately, there has been a growing trend in the publication of such manuscripts, including papers that use a theory or framework and connect it to the results or findings with limited contribution to science. Another type discouraged is "salami-sliced" papers (Harvey, 2020), where each paper fails to provide the entire impact and contribution to science.

4.2. Make relevant to practice

This principle means making sure that the paper addresses a topic of practical importance that can support the journey of organizations toward sustainability. It is, based on the specificity (Section 2), especially important to address a relevant issue to the specific problem or challenge identified by organizations. To ensure the relevance, the research needs to identify the context of an organization by describing the target users, their needs and interests, what activities or processes are addressed, how the organization is set up, and possibly other aspects: see Section 3 for the differences of degrees to consider the contexts.

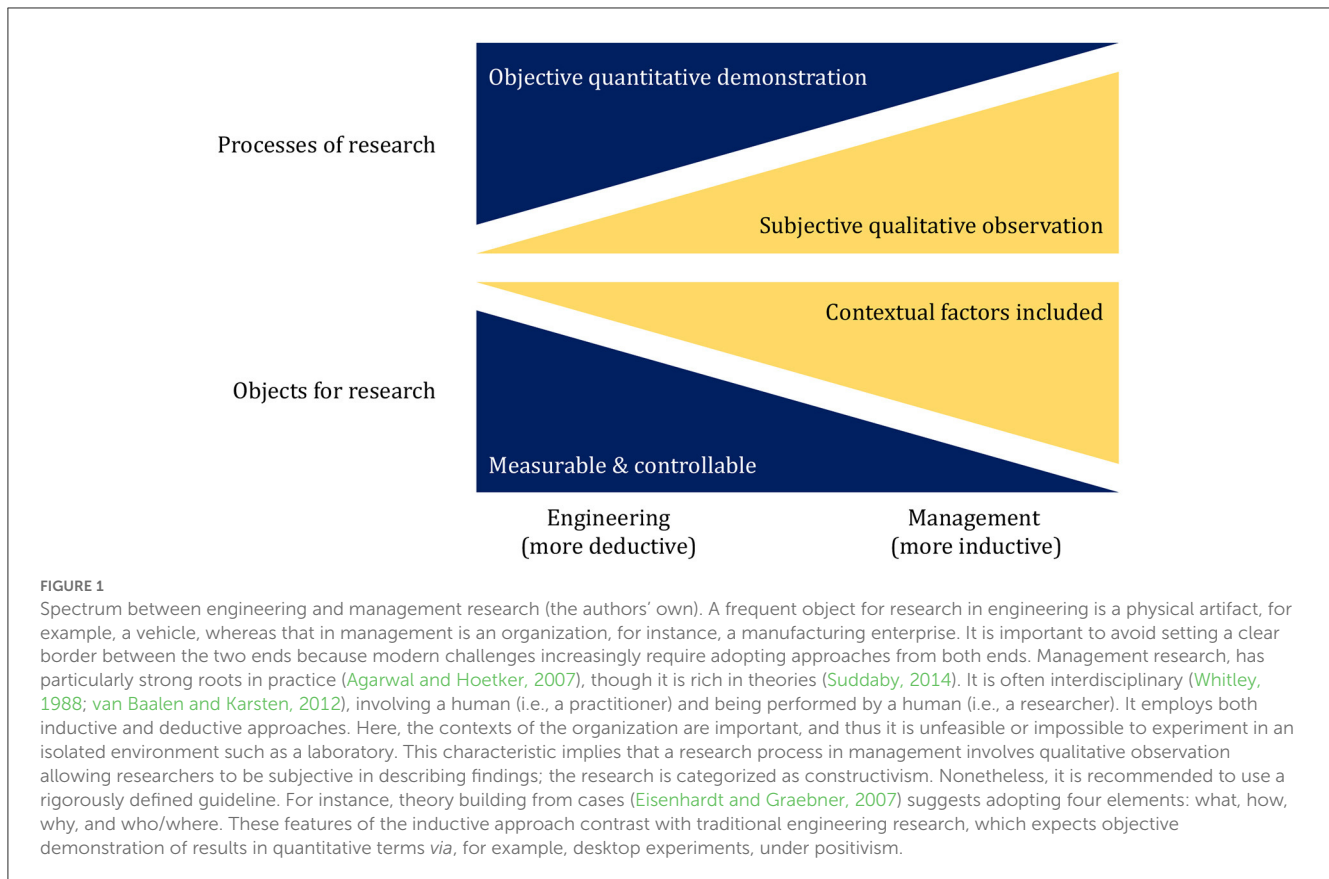
We discourage papers that tackle rarely existing problems, fail to consider the characteristics inherent to the problem, or assume data availability that is and will be unrealistic.

4.3. Demonstrate the significance for theory and practice

This principle means an important issue that has substantial effects on future research and practice is addressed; that is, an issue of materiality in theory and practice, indicating the strength of expected impacts for urgent issues (Section 2). Owning the two previous principles is a prerequisite for the significance: showing scientific knowledge for a bottleneck to move the field forward makes a paper stronger. To provide a higher level of significance, more important constructs need to be chosen.

We discourage authors from focusing on issues that are understood as of little importance, even if solving them is practically relevant and fills in a knowledge gap.

2 The term, least publishable unit, is often used as a synonym to a salami-sliced paper (Buddemeier, 1981; Lifset, 2010). However, in this paper, it rather positively refers to one that contains a scientifically meaningful chunk of knowledge.



4.4. Highlight the generalizability of results

This principle means that the theory is applicable to practice by a broader range of organizations with a common context, indicating the breadth of knowledge users. A higher-quality paper shows that results obtained from applying a theory to practice are generalizable beyond specific cases, and the extent of generalization is appropriately set for the topic; delimitations with the theory application are clarified together. With this type of paper, it is possible to replicate the theory application with a certain outcome in a higher number of organizations, referring to the knowledge transferability across cases; large scales in application are necessary for the sustainability issues (Section 2). Refer to Section 3 for the differences regarding the generalizability. Appropriate construct nomination is key for this principle.

We discourage papers focusing on findings from a particular case: for example, Organization A, with such a special context that other organizations, even in the same sector, cannot build upon the findings.

4.5. Control the research process

This principle means that the conducted research process, including the involved organization, sector, product/service type, functions/roles of practitioners, and research activities, is transparent, accountable, and replicable so that other researchers can follow and re-experiment it regardless of the discipline. The

BOX 1 The proposed five principles.

- I. **Contribute to theory**—Go beyond an application of a known theory to practice.
- II. **Make relevant to practice**—Address aspects that are relevant to practice.
- III. **Demonstrate the significance for theory and practice**—Explore issues that are material to both theory and practice.
- IV. **Highlight the generalizability of results**—Provide explicit conclusions that are generalized even from specific cases.
- V. **Control the research process**—Provide transparency and accountability in methods.

process control should also cover the quality of input data and results following the FAIR principles of findability, accessibility, interoperability, and reproducibility (Wilkinson et al., 2016). This principle should be combined with the previous one: particularly regarding the process of (not) generalizing findings (contributing to large scales; Section 2) must be transparent through the research process controlled and shared in a paper. Please refer to the objectivity spectrum of the research processes stated by Section 3 for more clarity.

We discourage authors from leaving ambiguity to readers concerning the research process to be replicated: for example, naming a research project in which the casework was performed is insufficient because other researchers cannot replicate the project.

4.6. A potential principle - scalability

An additional principle (i.e., potentially the sixth principle) to be mentioned is *scalability*, meaning that the created knowledge functions at a larger scale and is highly related to but more than the applicability. It concerns whether the application can reach a large scale (e.g., number of products, buyers, and regions) or rather stay at a niche in an organization or a sector. Scalability means expansion and is important for absolute contributions (Hauschild et al., 2020). Since scalability poses more challenges than the five principles (Forrest et al., 2020), it needs yet to be more common. However, it is ideal to incorporate or at least discuss scalability in a paper.

5. Discussion—Examples of applying the five principles

The applications of the five principles to different research areas³ are exemplified here; note that the examples given here represent a tiny portion within vast areas of application in several disciplines. Ecodesign or design for sustainability may lie between engineering and management. Its contributions to theory often include two categories: specificity and novelty to traditional disciplines. An instance of specificity is that the body of knowledge for ecodesign, for example, Abele et al. (2005), suggests additional use of life cycle assessment (LCA) in a task clarification stage that originates from traditional product design, for example, by Pahl and Beitz (1984). An instance of a novelty proposed to product design and service design is the concept value that was necessitated for overarching the two designs along the product lifecycle in the context of product/service systems (cf. Ceschin and Gaziulusoy, 2016; Brissaud et al., 2022). As an instance of significance, a critique has often been given to a paper proposing a new ecodesign method without considering the designers' knowledge (Brambila-Macias and Sakao, 2021).

The ISO environmental management system (EMS) includes contexts as one of its essential requirements (ISO, 2015). ISO 14001 has incorporated management theories in the environmental dimension through successful revisions over the last 27 years (the first version was in 1996). More than 400,000 certificates issued in 175+ countries (ISO, 2022) represent the relevance to practice in organizations worldwide, including effects and benefits in organizations with implemented and certified EMS assessed *ex-ante* (prior to implementation), ongoing, and *ex-post* (upon certification) (Djekic et al., 2014). Such findings in industry were, in return, drivers for environmental improvements of the theoretical background and revisions of the standard, intertwining theory and practice development. Also, the generalizability of the applied theories is a prerequisite for the implementation regardless of the main activities, complexity of processes, and final products/services (ISO, 2015, 2022). In parallel, we have witnessed the introduction of environmental engineering insights

³ Note that the issues here lie in research areas and scientific disciplines and not in professional functions: for example, engineering management discussed as a phase of engineering carrier (Lannes, 2001) is outside the scope of this paper.

in an effective EMS, such as the lifecycle perspective (ISO, 2015) and environmental performance indicators and footprints (Campos et al., 2015), and the promotion of other engineering activities such as cleaner production (Oliveira et al., 2016); this highlights the interplays between management and engineering, which need to be addressed in practice and research.

6. Conclusions

The problems with the quality of publications for organizations' sustainability, which requires research with multiple disciplines, must be confronted. Combining research in management and engineering is essential to accelerate the transition toward organizations' sustainability. Our five principles of good papers provide a steady horizon for researchers navigating career progression within integrity during times of challenging and ethically problematic publishing protocols and incentives. They can address the full spectrum of methodological considerations as discussed. Readers are invited to criticize, apply, and build upon these principles. Employing a combination of multiple methods, such as qualitative and quantitative ones (Creswell and Creswell, 2018), and cross-fertilizing an ecology of disciplines (Brambila-Macias et al., 2018) may be promising.

Author contributions

TS and RL: conceptualization, writing, and editing. CD: writing and editing. ID: writing the EMS part. All authors: commenting on and editing parts of drafts. All authors have read and agreed to the last version of the manuscript.

Funding

TS was financially supported by the Mistra Resource-Efficient and Effective Solutions program, funded by Mistra (the Swedish Foundation for Strategic Environmental Research) in Sweden under Grant DIA 2014/16.

Acknowledgments

Associate editors of this section that participated in the workshop at Universitat Jaume I of Castellón, Spain or online on the 4th of October 2022 are appreciated for their fruitful discussions with a draft for this manuscript. TS was thankful for the inspiring document "How to write a good STC Dn paper," written by Tetsuo Tomiyama exclusively for STC Design of CIRP (the International Academy for Production Engineering).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated

organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

- Abele, E., Anderl, R., and Birkhofer, H. (eds.) (2005). *Environmentally Friendly Product Development, Methods and Tools*. London: Springer. doi: 10.1007/b138604
- Agarwal, R., and Hoetker, G. (2007). The growth of management and its relationship with related disciplines. *Acad. Manage. J.* 50, 1304–1322. doi: 10.5465/amj.2007.28165901
- Bergmann, M., Schöpke, N., Marg, O., Stelzer, F., Lang, D. J., Bossert, M., et al. (2021). Transdisciplinary sustainability research in real-world labs: success factors and methods for change. *Sustain. Sci.* 16, 541–564. doi: 10.1007/s11625-020-00886-8
- Biagioli, M. (2022). Ghosts, brands, and influencers: emergent trends in scientific authorship. *Soc. Stud. Sci.* 52, 463–487. doi: 10.1177/03063127221095046
- Brambila-Macias, S., Sakao, T., and Kowalkowski, C. (2018). Bridging the gap between engineering design and marketing: insights for research and practice in product/service system design. *Des. Sci.* 4, e7. doi: 10.1017/dsj.2018.3
- Brambila-Macias, S. A., and Sakao, T. (2021). Effective ecodesign implementation with the support of a lifecycle engineer. *J. Clean. Prod.* 279, 12350. doi: 10.1016/j.jclepro.2020.123520
- Brissaud, D., Sakao, T., Riel, A., and Erkoyuncu, J. A. (2022). Designing value-driven solutions: the evolution of industrial product-service systems. *CIRP Ann. Manuf. Technol.* 71, 553–575. doi: 10.1016/j.cirp.2022.05.006
- Buddemeier, R. W. (1981). Least publishable unit. *Science* 212, 494–494. doi: 10.1126/science.212.4494.494a
- Campos, L. M., de Melo Heizen, D. A., Verdinelli, M. A., and Miguel, P. A. C. (2015). Environmental performance indicators: a study on ISO 14001 certified companies. *J. Clean. Prod.* 99, 286–296. doi: 10.1016/j.jclepro.2015.03.019
- Ceschin, F., and Gaziulusoy, I. (2016). Evolution of design for sustainability: from product design to design for system innovations and transitions. *Des. Stud.* 47, 118–163. doi: 10.1016/j.destud.2016.09.002
- Creswell, J. W., and Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. London: SAGE Publications.
- Djekic, I., Rajkovic, A., Tomic, N., Smigic, N., and Radovanovic, R. (2014). Environmental management effects in certified Serbian food companies. *J. Clean. Prod.* 76, 196–199. doi: 10.1016/j.jclepro.2014.04.062
- Eisenhardt, K. M., and Graebner, M. E. (2007). Theory Building from cases: opportunities and challenges. *Acad. Manage. J.* 50, 25–32. doi: 10.5465/amj.2007.24160888
- Forrest, N., Stein, Z., and Wiek, A. (2020). Transferability and scalability of sustainable urban water solutions—a case study from the Colorado River Basin. *Resour. Conserv. Recycl.* 157, 104790. doi: 10.1016/j.resconrec.2020.104790
- Gopalakrishna, G., Ter Riet, G., Vink, G., Stoop, I., Wicherts, J. M., and Bouter, L. M. (2022). Prevalence of questionable research practices, research misconduct and their potential explanatory factors: a survey among academic researchers in the Netherlands. *PLoS ONE* 17, e0263023. doi: 10.1371/journal.pone.0263023
- Harvey, L. A. (2020). We need to value research quality more than quantity. *Spinal Cord.* 58, 1047. doi: 10.1038/s41393-020-00543-y
- Hauschild, M. Z., Kara, S., and Röpke, I. (2020). Absolute sustainability: challenges to life cycle engineering. *CIRP Ann. Manuf. Technol.* 69, 533–553. doi: 10.1016/j.cirp.2020.05.004
- Ioannidis, J. P. A. (2005). Why most published research findings are false. *PLoS Med.* 2, 696–701. doi: 10.1371/journal.pmed.0020124
- ISO (2015). *ISO 140012015-Environmental Management Systems—Requirements With Guidance for Use*. Geneva: International Organization for Standardization.
- ISO (2022). *The ISO Survey of Certifications 2021*. Geneva: International Organization for Standardization.
- Kirchherr, J. (2022). Bullshit in the sustainability and transitions literature: a provocation. *Circ. Econ. Sustain.* 2022, 1–6. doi: 10.1007/s43615-022-00175-9
- Kozlov, M. (2023). 'Disruptive' science has declined—and no one knows why. *Nat. News.* doi: 10.1038/d41586-022-04577-5
- Lannes, W. J. (2001). What is engineering management? *IEEE Trans. Eng. Manage.* 48, 107–115. doi: 10.1109/17.913170
- Larivière, V., Haustein, S., and Mongeon, P. (2015). The oligopoly of academic publishers in the digital era. *PLoS ONE* 10, 1–15. doi: 10.1371/journal.pone.0127502
- Lifset, R. (2010). The least publishable unit. *J. Indus. Ecol.* 14, 183–184. doi: 10.1111/j.1530-9290.2010.00238.x
- Lozano, R. (2006). Incorporation and institutionalization of SD into universities: breaking through barriers to change. *J. Clean. Prod.* 14, 787–796. doi: 10.1016/j.jclepro.2005.12.010
- Lozano, R. (2018). Proposing a definition and a framework of organisational sustainability: a review of efforts and a survey of approaches to change. *Sustainability* 10, 1157. doi: 10.3390/su10041157
- Norström, A. V., Cvitanovic, C., Löf, M. F., West, S., Wyborn, C., Balvanera, P., et al. (2020). Principles for knowledge co-production in sustainability research. *Nat. Sustain.* 3, 182–190. doi: 10.1038/s41893-019-0448-2
- Oliveira, J. A., Oliveira, O. J., Ometto, A. R., Ferraudo, A. S., and Salgado, M. H. (2016). Environmental management system ISO 14001 factors for promoting the adoption of cleaner production practices. *J. Clean. Prod.* 133, 1384–1394. doi: 10.1016/j.jclepro.2016.06.013
- Pahl, G., and Beitz, W. (1984). *Engineering Design: A Systematic Approach*. London: Springer-Verlag, 95.
- Rawat, S., and Meena, S. (2014). Publish or perish: Where are we heading? *J. Res. Med. Sci.* 19, 87–89.
- Sakao, T., and Brambila-Macias, S. A. (2018). Do we share an understanding of transdisciplinarity in environmental sustainability research? *J. Clean. Prod.* 170, 1399–1403. doi: 10.1016/j.jclepro.2017.09.226
- Schön, D. A. (1983). *The Reflective Practitioner: How Professionals Think in Action*. London: Temple Smith.
- Seuring, S., Stella, T., and Stella, M. (2021). Developing and publishing strong empirical research in sustainability management—addressing the intersection of theory, method, and empirical field. *Front. Sustain.* 1, 617870. doi: 10.3389/frsus.2020.617870
- Suddaby, R. (2014). Editor's comments: why theory? *Acad. Manage.* 39, 412–422. doi: 10.5465/amr.2014.0252
- Taylor, M. (2012). Academic publishers have become the enemies of science. *Guardian* 12.
- Tsui, A. S., and McKiernan, P. (2022). Understanding scientific freedom and scientific responsibility in business and management research. *J. Manage. Stud.* 59, 1604–1627. doi: 10.1111/joms.12816
- van Baalen, P. J., and Karsten, L. (2012). The evolution of management as an interdisciplinary field. *J. Manage. Hist.* 12, 219–237. doi: 10.1108/17511341211206861
- Van de Ven, A. H. (1989). Nothing is quite so practical as a good theory. *Acad. Manag. Rev.* 14, 486–489. doi: 10.5465/amr.1989.4308370
- Whetten, D. A. (1989). What constitutes a theoretical contribution? *Acad. Manage.* 14, 258554. doi: 10.2307/258554
- Whitley, R. (1988). The management sciences and managerial skills. *Organ. Stud.* 9, 47–68. doi: 10.1177/017084068800900110
- Wilkinson, M. D., Dumontier, M., Aalbersberg, I. J., Appleton, G., Axton, M., Baak, A., et al. (2016). Comment: The FAIR guiding principles for scientific data management and stewardship. *Sci. Data* 3, 1–9. doi: 10.1038/sdata.2016.18