

Four Meta-Study Designs

	Qualitative Meta-Synthesis	Quantitative Meta-Analysis	Systematic Review	Scoping Review
Type of Literature	Qualitative	Quantitative	Qualitative, quantitative, or mixed methods	Qualitative, quantitative, or mixed methods
Purpose	To answer a synthesis question	To confirm a hypothesis or theory	To provide an overview of a set of literature	To map key concepts
Search & Selection	Can use systematic methods (design dependent)	Systematic methods; Assesses variability between studies	Systematic methods; Assesses quality	Systematic methods; No quality assessment
Analysis	Qualitative methods	Statistical methods	Summarizes literature findings	Preliminary literature assessment; Charts key concepts
Examples	Nite et al. (2017) Teasdale (2022)	Muneer et al. (2025) Sheffield et al. (2022)	Bano et al. (2024) Jenson et al. (2024)	D'Alton et al. (2025) Müller et al. (2025)

Examples of Meta-Study Designs in ISE

Qualitative Meta-Synthesis

- Nite, S. B., Capraro, M. M., Capraro, R. M., & Bicer, A. (2017). Explicating the characteristics of STEM teaching and learning: A metasynthesis. *Journal of STEM Teacher Education*, 52(1), 6.
- Teasdale, R. M. (2022). How do you define success? Evaluative criteria for informal STEM education. *Visitor Studies*, 25(2), 163–184.

Systematic Review

- Bano, S., Atif, K., & Mehdi, S. A. (2024). Systematic review: Potential effectiveness of educational robotics for 21st century skills development in young learners. *Education and Information Technologies*, 29(9), 11135–11153.
- Jenson, R. J., Lee, M. S., Vollmer, A. R., Maroushek, E. E., & Hughes, A. E. (2024). Exploring programmatic elements that foster neurodiverse children and adolescents' participation in informal STEM learning programs: A systematic review. *Disciplinary and Interdisciplinary Science Education Research*, 6(1), 22.

Quantitative Meta-Analysis

- Muneer, S., Santhosh, M., Parangusan, H., & Bhadra, J. (2025). A meta-analysis to explore the role of design thinking in enhancing creativity as learning outcomes in STEM education. *International Journal of Technology and Design Education*, 1–31.
- Sheffield, D., Butler, C. W., & Richardson, M. (2022). Improving nature connectedness in adults: A meta-analysis, review and agenda. *Sustainability*, 14(19), 12494.

Scoping review

- D'Alton, M. J., Thomson, P. I., & Scott, F. J. (2025). Non-formal chemistry learning: A scoping review. *Chemistry Teacher International*, (0).
- Müller, M., van den Bogaert, V., Foss-Jähn, M., Klein, P., Lorke, J., & Bruckermann, T. (2025). What factors affect the implementation of citizen science in secondary school science classrooms? A scoping review. *International Journal of Science Education, Part B*, 1–20.

Search Engines

For additional search engines beyond those listed here, please refer to Appendix 2c in our eBook (Ong et al., 2024).

- BioMed Central: <https://www.biomedcentral.com/>
- EBSCO (through the REVISE Center's website): <https://informalscience.org/repository/access-ebSCO/>
- ERIC: <https://eric.ed.gov/>
- Google Scholar: <https://scholar.google.com/>
- JSTOR: <https://www.jstor.org/>
- Networked Digital Library of Theses and Dissertations: <https://ndltd.org/>
- ProQuest: <https://www.proquest.com/>
- REVISE Center Repository: <https://informalscience.org/resources/>
- Science.gov (an official website of the US Government): <https://www.science.gov/>
- Science Direct: <https://www.sciencedirect.com/>
- WorldCat: <https://search.worldcat.org/>

Additional Resources

For additional resources beyond those listed here, please refer to the works cited in our eBook (Ong et al., 2024).

- Booth, A. (2016). Searching for qualitative research for inclusion in systematic reviews: A structured methodological review. *Systematic Reviews*, 5(74), 1-23.
<https://www.doi.org/10.1186/s13643-016-0249-x>
- Booth, A., Noyes J, Flemming K, Gerhardus, A., Wahlster, P., Van Der Wilt, G. J., Mozygema, K., Refolo, P., Sacchini, D., Tummers, M., & Rehfuss, E. (2016). *Guidance on choosing qualitative evidence synthesis methods for use in health technology assessments of complex interventions*. Integrated Health Technology Assessment for Evaluating Complex Technologies (INTEGRATE-HTA).
https://web.archive.org/web/20201230035756id_/https://www.integrate-hta.eu/wp-content/uploads/2016/02/Guidance-on-choosing-qualitative-evidence-synthesis-methods-for-use-in-HTA-of-complex-interventions.pdf
- Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, 5(1), 80–92.
<https://doi.org/10.1177/160940690600500107>
- Finfgeld-Connett, D. (2018). *A guide to qualitative meta-synthesis*. Routledge.
- Heyvaert, M., Hannes, K., & Onghena, P. (2017). *Using mixed methods research synthesis for literature reviews*. Sage.
- Ong, M., Jaumot-Pascual, N., Torres, L. E., Silva, C. B., & Martínez-Gudapakkam, A. (2024). *An introduction to qualitative meta-synthesis*. TERC. <https://info.terc.edu/ims-an-introduction-to-qualitative-meta-synthesis>
- Petticrew, M., & Roberts, H. (2008). *Systematic reviews in the social sciences: A practical guide*. John Wiley & Sons.
- Pham, M. T., Rajić, A., Greig, J. D., Sargeant, J. M., Papadopoulos, A., & McEwen, S. A. (2014). A scoping review of scoping reviews: Advancing the approach and enhancing the consistency. *Research synthesis methods* (4), 371–385. <https://doi.org/10.1002/jrsm.1123>
- Sandelowski, M., & Barroso, J. (2007). *Handbook for synthesizing qualitative research*. New York: Springer.
- Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology*, 8(1), 45.
<https://doi.org/10.1186/1471-2288-8-45>

Walsh, D., & Downe, S. (2006). Appraising the quality of qualitative research. *Midwifery*, 22(2), 108–119. <https://doi.org/10.1016/j.midw.2005.05.004>

Wohlin, C. (2014, May). Guidelines for snowballing in systematic literature studies and a replication in software engineering. In *Proceedings of the 18th international conference on evaluation and assessment in software engineering* (pp. 1–10). Association for Computing Machinery. <https://doi.org/10.1145/2601248.2601268>