EXAMPLES OF LITERATURE FOR DIFFERENT REVIEW TYPES AND METHODOLOGIES.

	Qualitative Meta-Synthesis	Quantitative Meta-Analysis	Systematic Review	Scoping Review
Engineering Education	Ong et al. (2020) Lönngren et al. (2024) Menon et al. (2024)	Garousi et al. (2019) Lo & Hew (2019) Yang et al. (2024)	Asghar et al. (2024) Borrego et al. (2013) Merzdorf et al. (2023)	Lönngren et al. (2021) Kleine, et al. (2024) Kramer et al. (2024)
Informal STEM Education	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)
Land Grant Universities & Extension Education	Izadi, Hosseini, & Rezaei-Moghaddam (2025) Gibson, Fortner, Lamm, Wilson, & Moore (2021)	LaSota, Polanin, Perna, Rodgers, & Austin (2025) Ogundari (2022) Schulz & Börner (2023)	Balis, Strayer, Ramalingam, Wilson, & Harden (2019) Meinertz, Perepezko, Lee, & Dozier (2025) Townley, Martinez, & Clark (2024)	Hagaman, Roark, & Washburn (2023) Becerra-Encinales, Bernal-Hernandez, Beltrán-Giraldo, Cooman, Reyes, & Cruz (2024) Spoth, Franz, & Brennan (2021)
STEM Education Public Policy	Hicks & Wood, 2016 Menon et al., 2024	Thomas & Larwin, 2023 Kuehnert et al., 2019	Konstantinidou & Evagorou, 2025 Ro et al., 2024	Borrego et al., 2025 Rijumora et al., 2024
Undergraduate STEM Education	Duncan et al. (2023) Tarlochan et al. (2025)	Bradford et al. (2021) Cromley et al. (2023)	Chestnut & Johnson (2025) Dogucu et al. (2025)	Denton & Borrego (2021) Hackerson et al. (2024)
Urban Agriculture	Goes Maia Marques et al. (2024) Hanaee (2018)	Dorr et al. (2021) Payen et al. (2022)	Huan et al. (2024) Ilieva et al. (2022)	Audate et al. (2019) Milestad et al. (2024)

Engineering Education Examples

Qualitative Meta-Synthesis

Lönngren, J., Bellocchi, A., Berge, M., Bøgelund, P., Direito, I., Huff, J. L., Mohd-Yusof, K., Murzi, H., Farahwahidah Abdul Rahman, N., & Tormey, R. (2024). Emotions in engineering education: A configurative meta-synthesis systematic review. Journal of Engineering Education, 113(4), 1287–1326. https://doi.org/10.1002/jee.20600

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Ong, M., Jaumot-Pascual, N., & Ko, L. T. (2020). Research literature on women of color in undergraduate engineering education: A systematic thematic synthesis. Journal of Engineering Education, 109(3), 581-615

Quantitative Meta-Analysis

Asghar, M., Minichiello, A., & Ahmed, S. (2024). Mental health and wellbeing of undergraduate students in engineering: A systematic literature review. Journal of Engineering Education, 113(4), 1046–1075. https://doi.org/10.1002/jee.20574

Borrego, M., Karlin, J., McNair, L. D., & Beddoes, K. (2013). Team effectiveness theory from industrial and organizational psychology applied to engineering student project teams: A research review. Journal of Engineering Education, 102(4), 472–512. https://doi.org/10.1002/jee.20023

Lo, C. K., & Hew, K. F. (2019). The impact of flipped classrooms on student achievement in engineering education: A meta-analysis of 10 years of research. Journal of Engineering Education, 108(4), 523–546. https://doi.org/10.1002/jee.20293

Systematic Review

Garousi, V., Giray, G., Tüzün, E., Catal, C., & Felderer, M. (2019). Aligning software engineering education with industrial needs: A meta-analysis. Journal of Systems and Software, 156, 65–83. https://doi.org/10.1016/j.jss.2019.06.044

Merzdorf, H. E., Jaison, D., Weaver, M. B., Linsey, J., Hammond, T., & Douglas, K. A. (2023). Sketching assessment in engineering education: A systematic literature review. Journal of Engineering Education, 113(4), 872–893. https://doi.org/10.1002/jee.20560

Yang, C., Zhang, J., Hu, Y., Yang, X., Chen, M., Shan, M., & Li, L. (2024). The impact of virtual reality on practical skills for students in science and engineering education: A meta-analysis. International Journal of STEM Education, 11(28). https://doi.org/10.1186/s40594-024-00487-2

Scoping Review

Kleine, M. S., Zacharias, K., & Ozkan, D. (2024). Contextualization in engineering education: A scoping literature review. Journal of Engineering Education, 113(4), 894–918. https://doi.org/10.1002/jee.20570

Kramer, A., Leonard, A., Desing, R., & Dringenberg, E. (2024). Beliefs in engineering education research: A systematic scoping review for studying beliefs beyond the most popular constructs. Journal of Engineering Education, 113(4), 1008–1045. https://doi.org/10.1002/jee.20583

Lönngren, J., Bellocchi, A., Bogelund, P., Direito, I., Huff, J., Mohd-Yusof, K., Murzi, H., & Tormey, R. (2021). Emotions in engineering education: Preliminary results from a scoping review. In 9th Research in Engineering Education Symposium and 32nd Australasian Association for Engineering Education Conference (REES AAEE 2021): Engineering Education Research Capability Development (pp. 225–233). Engineers Australia. https://search.informit.org/doi/10.3316/informit.347312916689166

INFORMAL STEM EDUCATION EXAMPLES

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. https://ir.library.illinoisstate.edu/jste/vol52/iss1/6

Teasdale, R. M. (2022). How do you define success? Evaluative criteria for informal STEM education. Visitor Studies, 25(2), 163–184. https://doi.org/10.1080/10645578.2022.2056397

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, 36, 919–949. https://doi.org/10.1007/s10798-025-10005-2

Sheffield, D., Butler, C. W., & Richardson, M. (2022). Improving nature connectedness in adults: A meta-analysis, review and agenda. Sustainability, 14(19), 12494.https://doi.org/10.3390/su141912494

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. https://doi.org/10.1007/s10639-023-12233-2

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. https://doi.org/10.1186/s43031-024-00113-9

Scoping Review

D'Alton, M. J., Thomson, P. I., & Scott, F. J. (2025). Non-formal chemistry learning: A scoping review. Chemistry Teacher International, 7(3), 385-409. https://doi.org/10.1515/cti-2025-0020

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, 15(3), 433–452. https://doi.org/10.1080/21548455.2025.2462797

LAND GRANT UNIVERSITIES & EXTENSION EDUCATION EXAMPLES

Qualitative Meta-Synthesis

Gibson, K.E., Fortner, A.R, Lamm, A.J., Wilson, M.C., & Moore, A.J. (2021). Examining interdisciplinary research collaborations to inform agricultural and environmental science communication: A meta-synthesis approach. Journal of Applied Communications, 105(2). https://doi.org/10.4148/1051-0834.2381

Izadi, H., Hosseini, S. M., & Rezaei-Moghaddam, K. (2025). Exploration of the conceptualization of the third mission of agricultural faculties: A qualitative metasynthesis study. Journal of Higher Education Outreach and Engagement, 29(3). https://files.eric.ed.gov/fulltext/EJ1486072.pdf

Quantitative Meta-Analysis

LaSota, R. R., Polanin, J. R., Perna, L. W., Rodgers, M. A., & Austin, M. J. (2025). Does aid matter? A systematic review and meta-analysis of the effects of grant aid on college student outcomes. Review of Educational Research, 95(3), 464-504. https://doi.org/10.3102/00346543241239955

Ogundari, K. (2022). A meta-analysis of the impact of agricultural extension services. China Agricultural Economic Review, 14(2), 221-241. https://doi.org/10.1108/CAER-07-2021-0130

Schulz, D., & Börner, J. (2023). Innovation context and technology traits explain heterogeneity across studies of agricultural technology adoption: A meta-analysis. Journal of Agricultural Economics, 74(2), 570-590. https://doi.org/10.1111/1477-9552.12521

Systematic Review

Balis, L. E., Strayer, T., Ramalingam, N., Wilson, M., & Harden, S. M. (2019). Open-access physical activity programs for older adults: A pragmatic and systematic review. The Gerontologist, 59(4), e268–e278. https://doi.org/10.1093/geront/gnx195

Meinertz, N. R., Perepezko, K., Lee, J., & Dozier, M. E. (2025). The impact of cooperative extension programs on late life mental health outcomes: A systematic review. Journal of Human Sciences and Extension, 13(2), 9. https://doi.org/10.55533/2325-5226.1547

Townley, C. T., Martinez, M. E., & Clark, B. A. (2024). Outdoor learning at US higher education institutions: A systematic review of research—1996 to 2020. SAGE Open, 14(4), 1-20. https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2023.1127813/full

Scoping Review

Becerra-Encinales, J. F., Bernal-Hernandez, P., Beltrán-Giraldo, J. A., Cooman, A. P., Reyes, L. H., & Cruz, J. C. (2024). Agricultural extension for adopting technological practices in developing countries: A scoping review of barriers and dimensions. Sustainability, 16(9), 3555. https://doi.org/10.3390/su16093555

Hagaman, A., Roark, K., & Washburn, L. T. (2023). US Cooperative Extension's response to substance misuse: A scoping review. Frontiers in Public Health, 11, 1-11. https://doi.org/10.3389/fpubh.2023.1127813

Spoth, R., Franz, N., & Brennan, A. (2021). Strengthening the power of evidence-based prevention in cooperative extension: A capacity-building framework for translation science-driven behavioral health. Child & Youth Care Forum, 50, 121–145. https://doi.org/10.1007/s10566-020-09559-0

STEM EDUCATION PUBLIC POLICY EXAMPLES

Qualitative Meta-Synthesis

Hicks, T., & Wood, J. L. (2016). A meta-synthesis of academic and social characteristic studies: First-generation college students in STEM disciplines at HBCUs. Journal for Multicultural Education, 10(2), 107-123. https://doi.org/10.1108/JME-01-2016-0018

Menon, D., Wieselmann, J. R., Haines, S., & Asim, S. (2024). A meta-synthesis of the literature on science & engineering teaching self-efficacy: current gaps and future research directions. Journal of Science Teacher Education, 35(5), 480-503. https://doi.org/10.1080/1046560X.2023.2297499

Quantitative Meta-Analysis

Thomas, D. R., & Larwin, K. H. (2023). A meta-analytic investigation of the impact of middle school STEM education: Where are all the students of color?. International Journal of STEM Education, 10(1), 43. https://doi.org/10.1186/s40594-023-00425-8

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Systematic Review

Konstantinidou, E., & Evagorou, M. (2025). A systematic review of empirical studies: Outcomes from programs informed by STEM reforms and policies. Eurasia Journal of Mathematics, Science and Technology Education, 21(1), em2558. https://doi.org/10.29333/ejmste/15795

Ro, H. K., Aguilar-Smith, S., Anderson, S. Y., Rodriguez, T., Ramon, E. J., & Javier, D. (2024). Attending to STEM education in servingness at Hispanic-serving institutions: a systematic review of more than a decade of scholarship. International Journal of STEM Education, 11(1), 33. https://doi.org/10.1186/s40594-024-00489-0

Scoping Review

Borrego, M., Chasen, A., Chapman Tripp, H., Landgren, E., & Koolman, E. (2025). A scoping review on US undergraduate students with disabilities in STEM courses and STEM majors. International Journal of STEM Education, 12(1), 2. https://doi.org/10.1186/s40594-024-00522-2

Rujimora, J., Campbell, L. O., & Butler, S. (2024). A scoping review of Hispanic-serving institutions literature in STEM. Journal of Latinos and Education, 23(5), 1648-1661. https://doi.org/10.1080/15348431.2024.2304568

UNDERGRADUATE STEM EDUCATION EXAMPLES

Qualitative Meta-Synthesis

Duncan, V. L., Holt, E. A., & Keenan, S. M. (2023). Creating an equitable and inclusive STEM classroom: A qualitative meta-synthesis of approaches and practices in higher education. Frontiers in Education, 8, 1154652. https://doi.org/10.3389/feduc.2023.1154652

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Quantitative Meta-Analysis

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Cromley, J. G., Chen, R., & Lawrence, L. (2023). Meta-analysis of STEM learning using virtual reality: Benefits across the board. Journal of Science Education and Technology, 32(3), 355-364. https://doi.org/10.1007/s10956-023-10032-5

Systematic Review

Chestnut, J., & Johnson, C. C. (2025). Factors Influencing Students' Academic Success in Introductory Chemistry: A Systematic Literature Review. Education Sciences, 15(4), 413. https://doi.org/10.3390/educsci15040413

Dogucu, M., Demirci, S., Bendekgey, H., Ricci, F. Z., & Medina, C. M. (2025). A systematic literature review of undergraduate data science education research. Journal of Statistics and Data Science Education, 1-13. https://doi.org/10.1080/26939169.2025.2486656

Scoping Review

Denton, M., & Borrego, M. (2021). Funds of knowledge in STEM education: A scoping review. Studies in Engineering Education, 1(2), 71–92. https://seejournal.org/articles/10.21061/see.19

Hackerson, E. L., Slominski, T., Johnson, N., Buncher, J. B., Ismael, S., Singelmann, L., ... & Momsen, J. L. (2024). Alternative grading practices in undergraduate STEM education: a scoping review. Disciplinary and Interdisciplinary Science Education Research, 6(1), 15.

URBAN AGRICULTURE EXAMPLES

Qualitative Meta-Synthesis

Hanaee, T. (2018). The meta-synthesis of dimensions and challenges of urban agriculture. Creative City Design, 1(2), 30-41. https://oiccpress.com/crcd/article/view/7598

Goes Maia Marques, A. B., De Paula Siqueira da Costa, J., Guedes Villar, E., & Walter, S. A. (2024). Elements of environmental and socioeconomic sustainability related to the food system: A meta-synthesis. Economia Agro-Alimentare/Food Economy, 26(2). https://doi.org/10.3280/ecag2024oa17521

Quantitative Meta-Analysis

Dorr, E., Goldstein, B., Horvath, A., Aubry, C., & Gabrielle, B. (2021). Environmental impacts and resource use of urban agriculture: A systematic review and meta-analysis. Environmental Research Letters, 16(9), 094025. https://doi.org/10.1088/1748-9326/ac1a39

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Systematic Review

Ilieva, R. T., Cohen, N., Israel, M., Specht, K., Fox-Kämper, R., Fargue-Lelièvre, A., Poniży, L., Schoen, V., Caputo, S., Kirby, C. K., Goldstein, B., Newell, J. P., & Blythe, C. (2022). The socio-cultural benefits of urban agriculture: A review of the literature. Land, 11(5), 622. https://doi.org/10.3390/land11050622

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Scoping Review

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