COMMENTARY

Disciplinary Integration in Teaching: The Necessity of Systematic Evaluation Tools

Chunlei Wu

Jiulongwan Campus of Wuxi Binhu Experimental School Affiliated to Nanjing Normal University, Wuxi 214071, Jiangsu, China

"The disciplines are the place where we begin, but not where we end."
- Allen F. Repko

THE discipline-based curriculum, which was typical of industrial-age education, still predominates in the current education systems in many countries, where educational institutions at various levels, particularly universities, prioritize specialization in curriculum design. While specialization may have been effective in improving teaching efficiency and rendering students' understanding more focused, it also leads to the creation of a mono-disciplinary knowledge (Tramonti, 2019). This discipline-based curricular paradigm has its limitations in addressing complex real-world problems, such as climate change, public health crises, and the digital divide, which never present themselves according to the disciplinary boundaries of physics, mathematics, or language arts and are inherently multifaceted. The solution of real-world problems necessitates an interdisciplinary perspective and the ability to draw on knowledge or skills from a variety of domains. Compared with discipline-based instruction, multidisciplinary, interdisciplinary, and transdisciplinary teaching (MITT) has the potential to improve affective and cognitive learning and critical thinking, offering learners/students the opportunity to obtain a broad general knowledge base (Hardy et al., 2021). For this reason, the adoption of MITT approaches has become a growing trend in global curricular reform.

Nevertheless, educational thoughts never naturally translate into smooth practice. Teachers who have attempted MITT can possibly encounter various thorny issues, such as how to integrate components from different disciplines in an effective manner rather than merely piece them together; whether to set separate learning objectives for each discipline or shared ones for an MITT project as a whole; accountability of the outcomes of integrated teaching – to hold individual subject teachers or the interdisciplinary team responsible; and more. Notably, the assessment is typically the most challenging process in MITT. Often, after completing projects that require knowledge from various areas like science, mathematics, and the humanities, the students need to sit final examinations for

separate subjects and receive no recognition for the comprehensive competencies they have developed in integrated learning. Issues like these point to the same crux: the lack of a systematic analytical framework that can direct the entire process of MITT including instructional design, implementation, and evaluation.

Abundant is research on MITT in the existing literature. For example, Helmane and Briška (2017) compared multidisciplinary, interdisciplinary, and transdisciplinary approaches in terms of focus, aim, assessment, and collaboration, highlighting that deeper disciplinary integration requires a shift from a focus on the content mastery to an emphasis on problem-solving and adaptive expertise. Klaassen (2018) explicated different design logics of "multidisciplinary → interdisciplinary" and "interdisciplinary → transdisciplinary" instruction models, using two authentic cases of MITT teaching, and found that the assumption among teachers that students would be automatically able to integrate information from different disciplinary sources was somewhat fallacious. Ignjatović (2020) offered clear definitions and examples for six levels of disciplinary integration, intradisciplinary, multidisciplinary, pluridisciplinary, cross-disciplinary, interdisciplinary, and transdisciplinary, and outlined ten key stages in integrated teaching. Studies like these suggest that MITT is never a simplistic patchwork of different subjects but a sophisticated process requiring a systematic guiding framework.

Interlinking-Based Teaching: A Study on the Development of the Interlinking Index Framework in this issue (Bozkurt & Ozdemir, 2026) is an endeavor to develop an analytical tool, the "interlinking index," for guiding the design, implementation, and assessment of "interlinking-based teaching." Based on a systematic literature review, content analysis, and expert review, the study created an evaluation framework comprising 17 indicators across four dimensions of content development, learning stakeholders, learning experiences, and learning outcomes. This framework supports integrated teaching at different levels, from intradisciplinary to multidisciplinary, interdisciplinary and transdisciplinary, aimed at facilitating teaching that centers on real-world problems, promotes students' multidimensional thinking, and foster their comprehensive competencies. On the positive side, the study's contribution is clear: it fills a gap in the existing literature by proposing a systematic guiding tool, offering educators a workable instrument for the MITT processes from planning to assessment. However, there is no evidence that the framework has been tested in any real classroom setting, with its operability, discriminative power, and actual effectiveness remaining unknown and warranting further investigation. Future research should be devoted to applying the index framework in authentic classroom environments for gathering teachers' feedback, examining its reliability and validity, and adapting it for different educational contexts.

References

Bozkurt, S., Ozdemir, O. (2026). Interlinking-based teaching: A study on the development of the interlinking index framework. Science Insights Education Frontiers, 33(2):5345-5364. DOI: https://dx.doi.org/10.15354/sief.26.or193

Hardy, J. G., Sdepanian, S., Stowell, A. F., Aljohani, A. D., Allen, M. J., Anwar, A., ... & Wright, K. L. (2021). Potential for chemistry in multidisciplinary, interdisciplinary, and transdisciplinary teaching activities in higher education. Journal of Chemical Education, 98(4), 1124-1145. DOI: https://dx.doi.org/10.1021/acs.jchemed.0c01363?ref=pdf

Helmane, I., & Briška, I. (2017). What is developing integrated or interdisciplinary or multidisciplinary or transdisciplinary education in school? Signum Temporis, 9(1), 7. DOI: https://dx.doi.org/10.1515/sigtem-2017-0010

Klaassen, R. G. (2018). Interdisciplinary education: a case study. European journal of engineering education, 43(6), 842-859. DOI: https://doi.org/10.1080/03043797.2018.1442417

Ignjatović, G. (2020). Integrative learning approach in ESP/ELP: Theoretical framework of intradisciplinary, multidisciplinary, interdisciplinary, and transdisciplinary integration. Зборник радова Правног факултета у Нишу, 59(88), 179-198. DOI: https://dx.doi.org/10.5937/zrpfn0-27891

Tramonti, M. (2019). Multidisciplinary strategies in education. The Future of Education.

***Correspondence to**:*
Chunlei Wu
Jiulongwan Campus of Wuxi Binhu Experimental School Affiliated to Nanjing Normal University
Wuxi 214071
Jiangsu
China
E-mail: 471949962@qq.com

***Conflict of Interests**: None*

***Doi:** 10.15354/sief.26.co039*