

Course Coordination and Student Success: Evidence From the Literature

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In the United States, Calculus I is extremely efficient at reducing student enjoyment and perseverance in mathematics (Bressoud et al., 2013). Coordinating gateway courses (e.g., precalculus, calculus) is a strategy that has been proposed as a way to improve students' experiences and outcomes (Bressoud & Rasmussen, 2015; Rasmussen et al., 2019). In an effort to assess that strategy, we conducted a literature review on course coordination to answer the question: *How is course coordination associated with changes in student success across institutions?* Our literature search consisted of peer-reviewed mathematics education journals and edited volumes that address coordination and institutional change efforts for student success. From this review, we identified 62 articles that explicitly mention or describe course coordination, with 23 discussing student success outcomes as a result of coordination.

Coordination is characterized as a system that synchronizes course content and instructor interaction under designated leadership, emphasizing collaborative design and ongoing instructor communication (Carney et al., 2025; Martinez et al., 2022; Rasmussen et al., 2019, 2021; Williams et al., 2021). Note that we define coordination beyond common syllabi, textbooks, and exams; it involves sustained structures that support the collaborative development of materials and pedagogy, with more robust coordination systems developing into *de facto* communities of practice (Apkarian & Rasmussen, 2020; Couch et al., 2023; Rasmussen & Ellis, 2015; Rasmussen et al., 2019; Williams et al., 2021).

Twenty of the 23 papers targeted passing rates as their measure of success and reported some level of improvement. These papers credited a variety of strategies, such as instructors forming a community to share in-class activities (Oliver et al., 2023) and addressing student concerns around grading transparency (Akin & Veil, 2020). Institutions that focused on research-based practices like active learning had larger improvements in their DFW rates, particularly when faculty were supported through learning assistants (LAs) or embedded peer tutors (e.g., Carney et al., 2020, Mingus & Koelling, 2021). Across these contexts, varied degrees of prescriptiveness had a similar pattern: shared infrastructure, ongoing instructor dialogue, and structured supports that align with improved pass rates and more equitable outcomes.

Eight of the 23 papers moved beyond pass rates to consider shifts in identity, belonging, and persistence in mathematics. Factors that contributed to students feeling a stronger sense of community within their classrooms included the integration of LAs (e.g., Chamberlain et al., Mingus et al., 2023), flipped classrooms that focused on student group discussion (e.g., Chamberlain et al., 2021; Diamond et al., 2021), and adoption of active learning activities (e.g. Hancock et al., 2021). Taken together, these student perceptions complement the achievement findings and align with broader accounts linking coordinated structures to enhanced confidence, interest, and persistence in STEM pathways. The poster will further elaborate on the benefits (and constraints) of different coordinated models for departments and mapping these design choices to student outcomes.

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