

Instructor and Coordinator Perspectives within First-Year Mathematics Courses

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The perspectives, habits, and mindsets of experienced instructors and coordinators serving within course coordination systems are valuable for effective coordination. In this paper, we present perspectives and recommendations from coordinators and instructors being coordinated with the goal of helping those who are new to coordination. We utilize Martinez et al.'s (2022) work on two coordinator orientations, Humanistic-Growth and Knowledge-Managerial, to frame the common perspectives of instructors and coordinators of first-year mathematics courses. Most participants gave reasonings for their decisions surrounding coordination with a healthy balance of Humanistic and Managerial considerations in mind.

Keywords: Course coordination, first-year mathematics, coordinator orientations

Research on course coordination has defined the ways in which perspectives, habits, and mindsets of coordinators can improve student and instructor experience and outcomes. In this paper, we synthesize the perspectives of mathematics course coordinators and instructors across one region, for the purpose of supporting (a) instructors and coordinators with little prior experience with course coordination, (b) math departments seeking to build/improve course coordination, and (c) for instructors and coordinators seeking to improve coordination.

The paper contributes to the research of course coordination by providing replication and expansion of Rasmussen & Ellis's (2015) work exploring coordination at universities with successful calculus programs and Martinez et al.'s (2022) work on coordinator orientations. There have been calls in the field for more replication studies (e.g., Melhuish, 2018; Melhusih & Thanheiser, 2018) and published replication studies (e.g., Borji et al., 2022; Melhuish, 2018) indicate that the field values replication studies. Our work replicates Rasmussen and Ellis' (2015) and Martinez et al.'s (2022) work by studying common perspectives of coordinators and instructors who work under coordinators within a regional but expanded context of first-year mathematics courses. These instructors' voices are critical for understanding what makes coordination successful.

Literature Review

As part of an extensive research project involving five PhD-granting universities known for having successful calculus coordination programs, Rasmussen and Ellis (2015) characterized aspects of effective course coordination in Calculus I. Their work highlights the role of one serving as a coordinator as someone who serves in a multi-year or semi-permanent position, is knowledgeable and respected in teaching, and who is oriented to serve both as a resource and facilitator. Rasmussen and Ellis describe the importance of coordination in which the course is viewed as community property with concrete actions taken to this end. Regular meetings are held to focus on the needs and priorities of the instructors, compare progress, share difficulties and ideas for problems, and develop common grading practices. Additionally, drawing on work in behavioral economics (Thaler & Sunstein, 2008), Rasmussen and Ellis identify the role of effective coordinators in serving as a choice architect - "someone who is responsible for organizing the context in which people make decisions" (p. 112), not someone who makes

decisions for others. They identified the role of coordinators in (a) making life easier by setting default options (providing resources), (b) providing feedback to users, (c) making mappings easy to understand, and (d) providing information about what others are doing. “If many people do something or think something, their actions, and their thoughts convey information about what might be best for you to do or think” (Thaler & Sunstein, 2008; p. 54)

Martinez et al. (2022) extended this work to studying coordinator *orientations* or views that “give a sense of direction for what one does, implicitly or explicitly” (p. 330). In their analysis of interviews with course coordinators and instructors, Martinez identified two coordinator orientations: a Humanistic-Growth Orientation and a Knowledge-Managerial Orientation (referred to here as *Humanistic* and *Managerial* orientations for simplicity). Each orientation was characterized by five themes. The Humanistic orientation involves the following five themes: (a) attending to student experience, primarily in receiving the same opportunity to succeed, (b) being concerned about others and expressing concern for others, (c) seeking to build community as a form of professional support, (d) being attentive to instructor differences in that “one size does not fit all”, and (e) providing instructor support through professional development opportunities and as a resource for general concerns. The Managerial orientation involves (a) drawing on knowledge of the course, department, and institution, (b) bringing knowledge and experience of a variety of pedagogical practices, (c) providing materials related to content and curriculum, (d) communicating clearly, and (e) exhibiting strong communication skills. Martinez et al. (2022) conjecture that “a combination of both coordinator orientations and their corresponding professional development approaches (community-based and material-based) is more likely to lead to substantive and sustained improvement” (p. 344).

Both Martinez et al.’s (2022) and Rasmussen and Ellis’ (2015) results draw from an extensive data corpus (over 92 interviews and 95 hours of audio recordings) of programs with established and effective support for course coordination. This study serves as a smaller-scale replication study (Melhuish, 2018) in studying the ways in which regional perspectives regarding course coordination are consistent with broader theoretical perspectives. In particular, this paper explores a broader category of mathematics course coordination in which there may be less structure or departmental support for course coordination, yet a growing local community of support for course coordination within and across mathematics departments.

Research Questions

In this context of both structured and semi-structured course coordination, we ask the following research questions:

1. What activities do coordinators devote their time and attention to in coordinating a course?
2. What perspectives, habits, and mindsets do coordinators and coordinated instructors find most conducive to effective course coordination?
3. In what ways do perspectives shared regarding coordination embody theoretical perspectives of Humanistic and Managerial coordinator orientations?

Methods

The authors of this paper recruited 14 instructors teaching and/or coordinating courses from five medium to large-enrollment universities in Oklahoma. Participants were recruited through an initial survey of participants of their primary role as coordinator or instructor. Of these instructors, a first subgroup of five instructors also served as coordinators of courses with structured coordination. These instructors were involved in coordinating various aspects of their course throughout the semester. A second subgroup of four instructors served as coordinators of

courses involving semi-structured coordination, where coordinators were part of a team that mostly made decisions before a semester as opposed to during it. A third group of participants involved instructors who have taught one or more coordinated courses with structured coordination.

The authors lead focus-group-style interviews in 6 separate sessions of 1-5 participants per session. Interviews were conducted on Zoom and recorded, running about 1.25 hours each. The authors recorded field notes of responses to each question. Recorded detailed interview field notes, along with transcriptions of targeted segments of the interviews were transcribed. The first author open-coded responses based on the intended context of the perspective and advice offered (Strauss & Corbin, 1998). After this, a second cycle of axial coding was used to segment comments by similar perspectives (Saldaña, 2013). A third round of coding involved identifying instructor perspectives, habits, and mindsets aligned with themes of Martinez et al.'s (2022) coordinator orientations. Finally, a cross-comparison across the second and third round of coding were analyzed.

Results

The following sections provide a summary of what coordinators and instructors shared regarding (a) the purpose and affordances of coordination, (b) the structure and roles of coordination, (c) the goals of coordination meetings, and (d) recommendations for coordinators and instructors in both structured and semi-structured coordination courses. Following this, we provide the cross-comparison of these four categories of perspectives with Martinez et al.'s (2022) coordinator orientations.

Purpose and Affordances of Coordination

One of the primary purposes cited by coordinators for developing a coordinated structure for a course was to increase consistency of course content and delivery. One coordinator cited that before coordination, “students had wildly different experiences.” Across contexts of coordination, instructors described how coordination enables a range of instructors to “bring the rigor [of the course] more closely together.” Coordinators also described coordination as a factor in improving the quality of course materials and design.

Instructors described the importance of coordination in providing resources for improving teaching and learning, as well as handling student issues. Coordination appeared to be a factor in increasing instructors' competence in teaching by providing support for instructional development and a community for discussing and handling issues of concern. One instructor stated, “If the course hadn't been coordinated, I would not have survived my first semester.” Another instructor stated that the coordinated structure “helped me focus more on teaching [and] what kind of questions I was asking; was I allowing enough time to absorb the material?”

All instructors described having an increased sense of relatedness to other instructors because of the coordination. They said coordination provided a venue to talk and ask questions of other instructors which was very beneficial. One instructor said they felt very appreciated by their coordinator, but not by the department's administration. This instructor had worked hard to flip the class, but in the following semester, was placed in a corequisite section where he was not allowed to flip the class. In the face of this loss of autonomy, he said “I'm a creative person, but I cannot bring this to the students - what I want to bring to them will not work out.” Regarding the increased structure and loss of control, another instructor said she felt like she still had enough autonomy, and another instructor said the added support of coordination afforded more autonomy to work on what she wanted.

Structure and Roles of Coordination

We acknowledge that coordination presents itself in a variety of ways, from the selection of a textbook and topics only, to more heavily coordinated courses where the vast majority of aspects are decided on by instructors. From the pre-interview survey, the coordinator participants indicated coordinating textbooks, topics, pacing, syllabi, exams, online homework, grading schemes, rubrics, written homework, and quizzes. They also cited responsibilities of instructor training, instructor observation, and feedback, fielding student complaints, instructor mentorship, instructor evaluation, setting up LMS, communicating with an accessibility resource office, administering makeup assessments, and scheduling exam rooms. In the interviews, several coordinators took particular concern for instructor training and mentorship for graduate students and new teachers. When concerns regarding teachers' instruction and behavior arose, one coordinator described these as opportunities for professional development and learning, assuring responsive instructors that they were not in trouble and that "this is all normal."

Coordinators who held regular coordination meetings spoke in detail about how they conducted these meetings since it was a primary form of communication between coordinators and instructors. Thus, the following section describes the goals coordinators held regarding meetings and how they approached them.

Goals and Approaches for Coordination Meetings

One of the primary ways of developing and carrying out coordination was through instructor meetings. While some coordinators preferred online communication and one-on-one meetings with instructors, the majority of coordinators focused substantial time and care on coordination meetings. Coordinators used coordination meetings weekly, biweekly, or monthly to (a) discuss course policies, (b) guide instructors, (c) provide training on the use of course materials or technology, (d) provide opportunities for professional support, and (e) distribute feedback. Some coordinators described the importance of using meetings to convey a vision or overarching story for the course that they wanted instructors to see and follow. Coordinators described using the start of meetings to check in, to "Look everyone in the eye and make sure they are doing what they are supposed to be doing. 'You all are in the same place? Good! Let's go on.'"

In their discussion, coordinators agreed that they wanted instructors to perceive meetings as necessary and helpful in meeting practical needs. To this end, they discussed the importance of planning and sending out an agenda prior to the meeting so that instructors can offer suggestions on what to add. However, meetings also furthered the humanistic goals of building relationships and providing mutual learning opportunities. One coordinator emphasized that she was "not 'the one' with the answers." Although the "young ones" were learning and observing what other instructors were doing, discussions often focused on sharing ideas, experiences, and suggestions in an environment where everyone could ask questions about the course and learn and buy into why the course was set up in the way it was. One coordinator emphasized being sensitive to people's time; if meetings are becoming off track or unproductive, they sought to address the cause individually or change the structure of the meetings.

Specific Recommendations

Advice for Coordinators. In addition to advice for meetings, coordinators and instructors alike shared advice directly related to organization, interpersonal skills, getting feedback and support, and beginning a new coordinator position. Instructors gave emphatic advice that coordinators work on organizational skills by building detailed lists of what tasks were important

at what time of the semester. One instructor described how important it was to receive resources in a timely way so that they could have sufficient time to prepare for class.

Coordinators advised focusing on interpersonal skills, especially in valuing the people you are working with, and discerning when to give ground to instructors and when to hold your line. Some coordinators described the importance as a coordinator of staying humble, asking questions, and continuing to learn from other instructors and coordinators. One coordinator advised framing the coordinator structure of their course as beneficial to new instructors. She said, “I am doing this to make things easier for you, and make things fair for students.”

Coordinators also emphasized the value of collecting feedback from instructors. One advised that “especially when you have inexperienced instructors who may chafe under authority, get administrators on board with this.” One instructor found instructor evaluations helpful for seeking feedback on what they did well and what didn’t, which spurred them to also seek feedback outside the formal system of evaluations.

Two coordinators described the complexity and burden of the responsibilities in their first year as coordinators, advising new coordinators to be careful about what they take on. One coordinator advised: “Come in and get your bearings first. Try it out the way it exists, if it’s not broken.” Another coordinator echoed this advice: “Learn what the prior person did, and just do it; wait to start making changes until after the first and second semester.”

Advice for those working in semi-structured coordination. While the above perspectives and principles may apply to a broad range of contexts, several course coordinators offered advice, particularly for those working in contexts where structured course coordination doesn’t yet exist. In seeking the benefits of coordination (aligning the content and rigor of courses, improving course resources, and increasing collaborative support), they shared some lower-stakes ways to add coordination into a course. One instructor suggested in addition to a common textbook and syllabus, providing suggested homework assignments, and problems that could be used as a guide to new instructors, but would not restrict established instructors. Another suggested collaboratively working on building a common final exam. One coordinator was chair of a committee of those who regularly teach a course and hold monthly meetings; she suggested that if instructors find meetings effective and helpful, they can lead to small but beneficial iterative changes in the course. Another coordinator suggested, “Don’t be afraid to add one thing per semester. And then keep it up.”

Advice for Instructors. Since coordination offers affordances and constraints that differ from teaching without coordination, coordinators offered the following advice for instructors teaching within a coordinated structure: “Don’t mistake the coordinator structure of the course for needed preparation,” and “Don’t underestimate the amount of time needed to properly prepare.”

When offering advice to those teaching a coordinated course for the first time, they emphasized asking questions and talking to other instructors. One instructor said, “It doesn’t matter how many years you have been teaching, you will encounter things that will miserably fail.” This instructor emphasized how, as new instructors, we forget how to explain the basics and are not used to commanding attention and creating rapport with students: “Anything that you don’t know how to do, it is helpful to have a team to talk to.”

Advice to both instructors and coordinators. One instructor noted that both instructors and coordinators share the common goal of working well with students clearly communicating expectations. Thus, he advised both instructors and coordinators to see themselves as a team and work as a team.

Cross-Coding of the Results with Coordinator Orientations

Of a total of 308 comments assigned specific codes, 292 spoke positively of various aspects of coordination, and 16 spoke negatively of the coordinated structure. Of these 16, seven comments negatively described the specific structure and roles of the curriculum in relation to student experience (e.g., regarding the instructor's loss of autonomy in being assigned by the department a corequisite section in which he was not allowed to flip his classroom). The remaining 297 comments were distributed as presented in Table 1, which are further discussed in the next section. Table 2 provides a legend of the coordinator orientation codes used in Table 1.

Table 1: Cross-coding of coordinator orientations with axial coding of positive perspectives (number of instances coded with a positive perspective of coordination)

		Coordinator Orientations										NA	Total
		H1	H2	H3	H4	H5	M1	M2	M3	M4	M5		
Axial Coding	Purpose & affordances	9	2	3	4	6	2	4	6	1	2	9	48
	Structure & roles	10	7	5	7	14	5	2	24	4	7	3	88
	Coordination meetings	4	5	8	5	13	0	2	3	1	4	4	49
	Recommendations	3	3	6	2	3	5	2	1	2	11	6	44
	NA (no cross code)	13	4	4	9	6	1	3	8	6	9		63
Total		39	21	26	27	42	13	13	42	14	33	22	292

Table 2: Codes of Coordinator Orientations (Martinez et al., 2022)

Humanistic-Growth	Knowledge-Managerial
H1: Attends to student experience	M1: Draws on knowledge of the course, department, & institution
H2: Concerned about others	M2: Demonstrates experience & knowledge of teaching the course
H3: Takes action to build community	M3: Provides material related to content & curriculum
H4: Attentive to instructor differences	M4: Communicates clearly
H5: Provides instructor support	M5: Exhibits strong administrative skills

Discussion

The above cross-coding of common perspectives regarding coordination and Martinez et al.'s (2022) coordinator orientations highlight the following in regard to this particular sample of instructors and coordinators. In describing the purpose, affordances, structure, and roles of coordination, these instructors particularly valued orientations of attending to student experience (H1), providing instructor support (H5), and providing course materials (M3). When offering explicit advice for coordinators and instructors, participants were more likely to emphasize attitudes and behaviors reflecting the importance of coordinators having strong administrative skills.

The most frequent theme found in the cross-coding was the Structures & Roles theme coupled with M3: Provides material related to content & curriculum. This is unsurprising in that a primary requirement of coordination in the context studied is that materials of some kind are provided. What may be more interesting within the Structure & Roles theme, however, is the noticeable presence of Humanistic perspectives. The coordinators spent a significant portion of

time discussing how their decisions affected the students' experiences and whether or not they supported their instructors. The key role of coordination in how it affects the student experience was about keeping the course fair for all students, regardless of which instructor they had. The coordinator's concern for supporting their instructors was evident in how they discussed teacher training, observations of classes, and management of assessments and the LMS.

Course coordination meetings have the potential to emphasize Managerial aspects of coordination; however, Table 1 shows that the participants viewed the purpose of meetings more in terms of Humanistic perspectives. The purpose of the meetings for the participants was more about support and building a community than it was about relaying materials and rules for the course. Both coordinators and instructors were eager to offer recommendations for future coordinators and instructors. Frequently, their advice involved administrative skills that a coordinator needs to have in order to be effective and they made practical suggestions like making explicit to-do lists for each semester.

In their experiences with coordination, instructors described, in varying degrees, gaining an increased sense of competence, autonomy, and relatedness for teaching. However, in one case, coordination constrained an instructor's sense of autonomy, and in turn their creative engagement and motivation for teaching. Thus, it can be especially important for coordinators to give attention to specific decisions that may impact instructors' sense of autonomy. While decisions of course assignments and scheduling decisions may never be perfect, fostering a team mindset can mitigate negative attitudes regarding loss of autonomy. This instructor's experience also highlights the importance of coordinators holding team meetings and building relationships in which instructors can express and feel supported in their concerns. In line with Martinez et al.'s (2022) conjecture that a combination of coordinator orientations is more likely to lead to improvements, the participants in this study described effective coordination as involving decisions led by both coordinator orientations.

Conclusion

Research serves to provide a context for instructors and coordinators with little prior experience with coordination for understanding how to understand the affordances and constraints of coordination and to quickly and effectively adapt efforts within this system. Therefore, one of the purposes of this work is to create a practical guide for those coordinating for the first time, as well as for those teaching a coordinated course for the first time. We hope that categorizing the participants' perspectives by coordinator orientations can help others with new coordination systems and navigating initial decisions.

Coordination can support first-time instructors to progressively focus their attention on where they can grow the most in their effectiveness as instructors, by focusing first on (a) their own roles and responsibilities as an instructor, then as questions/issues arise, (b) their role in relationship to coordination, and ultimately (c) their role in as part of a team of instructors delivering consistent and quality instruction. Coordination also supports coordinators to allocate energy most effectively at various stages in their service as coordinators. Especially in light of the cyclical nature of course-coordinator-responsibilities (pre-semester preparation, course implementation, post-semester reflection and evaluation, revision, repeat), these perspectives can help coordinators evaluate where their skills, expertise, and experience can help people the most.

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