

HOW BEGINNING SECONDARY MATHEMATICS TEACHERS RECONCILE COMPETING PROFESSIONAL OBLIGATIONS

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Building on the theory of practical rationality, we explore how three beginning secondary mathematics teachers reconcile competing professional obligations, namely: disciplinary, individual, and institutional obligations. As these teachers transitioned from supervised teaching to teaching their own classrooms, they reconciled competing obligations and developed their own ideas about mathematics teaching and learning. The analysis revealed that it was only institutional obligation that conflicted with either disciplinary, or individual obligation, or with teachers' own teaching preferences. No other two obligations appeared to clash. The conflict with institutional obligation was reconciled in favor of institutional obligation in less than 30% of instances. In the vast majority of cases, another obligation took precedence.

Keywords: Beginning Secondary Teachers, Teacher Obligations, Practical Rationality

“I thought that my job was to teach math. I was not emotionally prepared for all the other things I need to do in the classroom.” These words of a first-year secondary mathematics teacher illustrate the complexity of classroom teaching and the many demands inherent in the profession. Raising the question of “How teachers manage to teach”, Lampert (1985) asserts that the work of teaching requires constant management of practical dilemmas caused by competing responsibilities or commitments. For example, a commitment to attend to an individual student’s understanding may clash with a commitment to “cover the curriculum;” or a commitment to advance academic achievement may conflict with providing a comfortable learning environment to students. Becoming a mathematics teacher involves, among many other things, learning to manage these types of dilemmas (Herbst & Chazan, 2003; Windschitl, 2002).

Beginning mathematics teachers transitioning from university-based teacher preparation programs to school teaching need support in learning how to recognize and deal with such dilemmas (Bieda et al., 2015). One way to support beginning teachers in this process is through an internship—supervised teaching experience, in which a teacher candidate is placed full-time in the classroom of a mentor-teacher. However, research shows that rather than being supported, interns experience additional competing commitments: toward the university supervisor advocating for ambitious teaching vs. the often-traditional practices of the mentor teacher (Bjerke & Nolan, 2023; Gainsburg, 2012). When entering their first teaching job, novice teachers assume additional classroom responsibilities, some of which have previously been managed by their mentor (e.g., communicating with parents, reporting to administration, coordinating instruction with other teachers). As a result, beginning teachers may feel overwhelmed, and enter a survival mode (Stokking et al., 2003) characterized by rigid, traditional teaching styles. Yet, some novice teachers hold on to the ambitious teaching practices learned in teacher preparation programs (Gomez Marchant et al., 2021; Thompson et al., 2013).

The implied interconnectedness of beginning teachers’ early-field experiences and their emerging classroom practices indicates the importance of enhancing our understanding of how beginning teachers learn to reconcile and manage the multiple dilemmas of classroom teaching. However, research examining this topic, especially longitudinally, has been limited (Cochran-Smith et al., 2008; Gainsburg, 2012). Our study aims to address this research gap.

The study reported herein is part of a larger NSF-funded project that explores the professional growth of beginning secondary mathematics teachers across four years, in multiple settings: from the senior year in their teacher preparation program, into the supervised internship, and their own classrooms. In this paper, we focus on three such beginning teachers: Nancy, Olive, and Diane (pseudonyms) who volunteered to participate in the study. All three teachers excelled in their academic studies as secondary mathematics education majors and demonstrated high buy-in for integrating ambitious teaching practices, as evidenced by the dispositions survey they completed as undergraduates. Moreover, the three participants had some experience with integrating ambitious practices in real classroom settings in their undergraduate preparation (Buchbinder & McCrone, 2023). We examine how these well-prepared beginning teachers coped with the challenges of transitioning from university to school teaching; and, how they reconciled competing commitments and teaching dilemmas.

Theoretical Perspectives

Teacher decision-making draws on many resources, such as teacher knowledge, personality traits, and beliefs. Herbst and Chazan's (2003, 2011) theory of *practical rationality* suggests that beyond individual characteristics, there are certain professional *obligations*, that are common to anyone who holds the position of teacher in the institution of schooling. The authors identify four broad types of professional obligations. The obligation to the *discipline* of mathematics involves authentically representing mathematical concepts, and engaging students with mathematical ideas, values (e.g., accuracy of vocabulary and notation), and practices (e.g., discovery, reasoning, and proving). The obligation to students as *individuals* involves attending to fairness, and consideration of individual student's needs, cognition, and emotions. *Interpersonal* obligation considers the class as a whole, requiring the teacher to manage social dynamics, intergroup relations, and ensure fair sharing of resources, time, and space. The *institutional* obligation requires the teacher to follow school, district, and state policies related to curriculum assessment and standards, and adhere to practices and guidelines shared by members of school mathematics departments.

Becoming a mathematics teacher involves adopting a decision-making framework for managing the work of day-to-day classroom teaching in the institution of schooling. The four professional obligations are an inherent part of this framework, whether explicitly acknowledged by teachers or not. The obligations do not prescribe teacher actions, but rather serve as sources of justification for those actions (Chazan et al., 2016). As pointed out by Bieda et al., (2015) the "obligations can be found in teacher talk as they warrant claims, either explicitly or implicitly, about what should or should not, or might or might not, be done in classroom interaction." Additionally, due to their often-implicit nature, obligations can be captured in situations where they come into conflict with one another. As teachers describe their classroom dilemmas their obligations come to the fore; and by examining the action taken following the decision-making process, we can learn about how the beginning teachers reconcile the competing obligations.

In this paper, we focus on negotiation, managing, and reconciling competing obligations by three beginning secondary mathematics teachers. We examine the following question: *In the discourse of beginning secondary mathematics teachers, what types of obligations surface as competing with one another, and how do teachers reconcile competing obligations?*

Methods

Data Collection and Analysis

Three beginning teachers: Nancy, Olive, and Diane volunteered to participate in the study as

undergraduates and remained with the project for four years. In this paper, we focus on two time periods: (1) a supervised internship during which each intern taught in their mentor-teacher classroom, and (2) the first year of autonomous teaching. For Nancy, this supervised internship was a traditional length of one year with occasional stretches of autonomous teaching in the second semester. Olive and Diane were promoted to full-time autonomous teaching in their second semester due to the staffing needs of their schools and in light of their exceptional performance. For each participant, we collected multiple video observations, lesson artifacts, and interviews. The data for this paper comes from three interviews conducted with each participant during their first year in classrooms: one at the beginning of the internship and two in the second semester after lessons in which the participants taught autonomously. The fourth interview was conducted in March the following school year by which time they were all novice teachers. All interviews were conducted after one of the researchers observed a lesson taught by the participant. The interview questions probed the instructional decisions involved in the planning and enactment of the lesson.

The interview transcripts were split among three researchers (the authors of the paper), and each interview was coded individually by two researchers. The three researchers met weekly to discuss the coding and reconcile disagreements; such that each code was reviewed by at least two researchers. Teachers' discourse in these transcripts was examined at the utterance level for the presence of an action or decision made by the participant and the justification for that action/decision. These justifications were coded according to the four professional obligations described above (Chazan et al., 2016). In addition, some actions were justified on account of personal resources (i.e., knowledge, beliefs, preferences), when the participants described how they wanted their classrooms to look and feel. For example, consider the quote: "They [students] surprise me every day. I love that every time you do an activity, you're never doing the same thing twice. And every time I try to tweak it a little bit in the right direction." In this quote, Olive's action of "tweaking" an instructional activity is justified on account of her personal enjoyment of the teaching process and breaking the routine ("never doing the same thing twice.")

In this paper, we focus on those instances in our data where two obligations (or an obligation and a personal preference) appeared as conflicting with each other, and the teachers reconciled between them. Although these instances were relatively rare, they illuminate the dilemmas these beginning teachers faced and resolved early on in their professional journey. Hereafter, we refer to these instances as *reconciling obligations*.

Results

Of the total 492 obligation codes, only 35 codes (7%) involved reconciling obligations. For Diane, 8 of 132 obligation codes (6%) were reconciling; for Olive, it was 15 of 156 obligation codes (9%); and for Nancy 12 of 174 obligation codes (7%) involved reconciling. In all instances of reconciling two obligations, one of those obligations was *institutional*. Meaning that either disciplinary or individual obligations or personal teaching preferences conflicted with the institutional obligations. In 28% of all instances, the conflict was reconciled in favor of institutional obligation, but in most cases (72%) it was reconciled in favor of some other obligation (See details in Table 1, below).

Reconciling Institutional and Individual Obligations

In the participants' discourse, institutional obligation most often conflicted with an obligation to students as individuals. This occurred in 18 out of 35 instances (51%).

At the beginning of the internship, some institutional obligations were represented by the need to adhere to the teaching style and the guidance of the mentor teacher. For example, Diane

described that her mentor teacher suggested she should show students two ways of solving problems of calculating percentages, but Diane felt it would confuse the students. She said:

It's like one extra step that they'd [students] have to do that I think would be confusing for them. So, I don't know if I would've even mentioned it, but my cooperating teacher suggested mentioning it.

Here, Diane's desire to avoid confusing students (individual obligation) conflicted with the institutional obligation of following the suggestions of the mentor. Olive experienced a similar tension, although in her case, Olive felt she had to adhere to her mentor teacher's advice to instruct students to solve linear equations by collecting variables on the left side only. Despite her reservations, and because she "didn't want them [students] to do something that the other class didn't do," Olive upheld the institutional obligation and followed her mentor's advice.

As the teachers transitioned to autonomous teaching, the relationships with the mentor were no longer a concern. A different aspect of institutional obligation was now discussed by the teachers but remained in tension with the individual obligation. Specifically, the teachers talked about the tension between the need to "cover the curriculum" while at the same time attending to individual students' needs, prior knowledge, pace of learning, and even moods. Teachers mostly reconciled this tension in favor of the institutional obligation. For example, Diane described her context saying that there are "two students that are completely behind every time and I can't stop and constantly work with them, but I feel bad moving on." Similarly, Olive described the need to move along the curriculum while attending to individual students' learning pace. She shared:

The reality of the situation is that I cannot give the same work to every kid in this class and expect them all to do well on it. That is just not the case. There are kids who need more than other kids. [...] It's definitely taught me a lot about trying to differentiate and trying to make sure I have extra [...] resources and things for them to do so that they're not bored.

In this quote, Olive acknowledged that students learn differently; therefore, her solution to managing this diversity was to differentiate her curriculum, ensuring some students were "not bored" while others receive different types of tasks in order "to do well."

Of the three teachers, Nancy was the one to express the tension most explicitly between institutional and individual obligations. She described this as follows:

I feel like the standards and the things that they want us to teach are taking away from some of the fun stuff that we can do with it. And so, [...] I get kind of frustrated because I wanna do fun stuff, but I also know I have other stuff I have to do and it's just kind of trying to find a happy medium, which I don't think I've gotten to yet.

In this quote, Nancy described the tension between the institutional obligation to address the content standards of her curriculum ("things they want us to teach") and her desire to create an engaging learning environment for the students ("fun stuff we want to do"). She described her frustration with the situation admitting that she has not yet found a "happy medium."

Despite the strong influence of institutional obligation, all three teachers described how they resolve, or strive to resolve the conflict in favor of individual obligation. For example, Nancy explained how she worked on revising the curriculum that was handed down to her to make it more engaging and "fun" for the students:

That's something I've been working on since the beginning because in the beginning of the year it was basically just worksheet review, worksheet, review, worksheet, notes. Like there

was no engagement happening. Um, and that's just because those were the resources I was given. But now it's a lot more interactive. There's a lot more fun activities built in.

Diane talked about reconciling the tension between institutional and individual obligations in terms of finding ways to “set them [students] up to be successful without making it too hard, but also without lowering expectations too much.” Diane disagreed with some of her colleagues’ advice of breaking the problems into isolated skills. She said:

Talking with some other teachers, they would be like, ‘oh, you’ll never mix quotient rule with negative exponents.’ [...] I really want to push them [students] to be able to problem solve through a couple of steps. My goal is trying to find a manageable way to set them up to do that without making the work so difficult that they don’t do well.

The institutional obligation in Diane’s quote is represented through the community of teacher colleagues, and the advice given to her. Yet the obligation toward individual student thinking and their ability to problem solve takes precedence for Diane in this instance.

Reconciling institutional and individual obligations in favor of the latter sometimes took the form of developing greater sensitivity to students’ feelings. Olive explained this as follows:

I’ve got a pulse for how the kids change every day. Sometimes they’re in a [...] good mood. Sometimes [...] it’s not time to bug that student. [...] that kid is in a place today that this math is not the biggest concern right now. [...] I can work with that kid tomorrow and that’s okay for today because that kid is not having a day.

In this quote, Olive described how she gradually developed “a pulse” for her students’ moods, and their ability to act as students in her classroom. Using the word “kids” rather than “students” indicates her obligation to them as individuals, as Olive described prioritizing their well-being over moving on with the curriculum.

Of the 18 instances of conflicts between institutional and individual obligations, the teachers reconciled the dilemma in favor of institutional obligations 5 times and in favor of individual obligations 13 times. While these numbers are small and cannot be generalized in any way, we report on them to provide a sense of data trends.

Reconciling Institutional and Disciplinary Obligations

Institutional obligation competed with disciplinary obligation in 15 out of 35 instances, and in 10 of them the conflict was resolved in favor of disciplinary obligation. The disciplinary obligation was represented by the teachers’ commitment to have students learn important mathematical concepts and procedures meaningfully and thoroughly. Additionally, this entails having students learn mathematics in ways aligned with disciplinary values and practices such as exploration, discovery, reasoning, proving, tinkering, and figuring out things for themselves.

Enacting classroom activities that uphold these disciplinary practices may be demanding for novice teachers and may compete with the institutional obligation. For example, as a novice teacher, Nancy received instructional materials from a more experienced colleague. Nancy expressed frustration with the traditional nature of these materials and with an implicit expectation to align her instruction with this mode of teaching. She said:

We’re doing translations and there are so many cool things you can do with translations. [...] And I just feel like I need to do the guided notes and practice problems, even though, I don’t know, I guess I don’t necessarily have to, but it’s just like, there are these notes and things that in the past it’s been really great for her [another teacher] and it works for her. And I’m just like, I just don’t wanna sit there and talk to them for 30 minutes at a time.

This quote shows Nancy's perceived obligation to uphold institutional expectations to coordinate instruction among teachers of the same grade level ("I feel like I need to do the guided notes"). This conflicted with her obligation to disciplinary practices of doing meaningful mathematics ("many cool things you can do with transformations"). Despite Nancy's dissatisfaction, the institutional obligation seems to take precedence in this instance.

Other examples of reconciling in favor of institutional over disciplinary obligation occurred when teachers were pressed for time or struggled to manage classroom discussions. As a result, they cut short an exploratory activity (e.g., "We didn't end up doing this [exploration] because of time. I had to get to the next stuff"); or lowered the conceptual depth of the discussion (e.g., "[If I] try to circulate that room and have a deep conceptual conversation with each of those 28 [students], I don't even think I'd have time in the block to do that").

Nevertheless, in most instances (10 out of 15) the teachers prioritized disciplinary obligation over the institutional. For example, as an intern, Olive modified her mentor's lesson plan about linear inequalities to introduce a short exploration for students to understand why multiplying or dividing an inequality by a negative number changes the sign of the inequality. Olive admitted she had to "push to do that just because in the original lesson plan [...] the idea of flipping the inequality sign is not really explored at all." Olive explained that she was "worried that they [students] were going to ask why, and I didn't want to not have an answer to that question." This shows that Olive had to overcome the institutional authority of her mentor and of the prescribed curriculum, to provide a conceptual justification for a mathematical rule. As a novice teacher, she continued to modify her curriculum to make for a more conceptually rich practice. She said:

If there [is] a worksheet with a ton of problems on it, I will try to deliberately choose three different ones that [...] really throw you for a loop, so that they [the students] see different representations of problems where they're doing a similar process, but they're seeing there's something novel about each one.

Similarly, Diane described how she attempted to uphold the institutional goal of having students practice surface area and volume formulas through an exploratory activity where students calculated the surface area and volume of physical objects wrapped in aluminum foil:

I didn't do much practice with them even using surface area formulas [...] and volume formulas. So, they [the students] had the practice of figuring out what the formula means, plugging the numbers in. [...] It was different [...] from every day because they [the students] were kind of drawing their own conclusions at the end.

In this quote, Diane almost apologetically admitted that she "didn't do much practice" with the students. This practice was achieved by breaking out from the everyday routine and by upholding the disciplinary obligation of having students "figure out what the formula means, plugging numbers" and "drawing their own conclusions."

The theme of breaking the routine, "doing something different," (Diane) introducing "fun stuff" (Nancy), and "just really hate[ing] the drill and kill idea" (Olive) was common for all three teachers. Sometimes, exploratory activities "did not fit in naturally," in Nancy's words, with the ongoing curriculum topics. For example, Nancy used the pretext of Pi-day (March 14th) to have students explore the value of Pi while teaching linear equations. Despite the tension with the institutional obligation, all three teachers found creative ways to uphold the disciplinary obligation.

Reconciling Institutional Obligation with Personal Preferences

Occasionally, teachers described tensions between institutional obligations and their personal beliefs and preferences about teaching; these tensions were resolved in favor of the latter. Olive discussed her choice to shorten homework assignments, saying that the shorter assignment was more “fair” for students and that this choice was “the first time I had done something that was my idea.” Similarly, Nancy described going against her mentor teacher’s typical grouping of students into teams of three, saying “I wanted to do groups of four because I feel like groups of four are better”. In each case, the institutional obligation (giving homework, grouping students) was overridden by teachers’ personal preferences for how they wanted to organize their classrooms (shortening homework and changing group size), which ultimately shaped their actions. Although such conflicts were rare, it was important to these teachers to follow their personal beliefs about teaching, rather than always strictly adhering to institutional norms.

Summary and Discussion

Table 1 summarizes the distribution of codes showing how the three participating teachers reconciled between competing obligations in favor of one of them. For each type of code, the percentage is calculated out of the total N=35 reconciling codes. For each teacher, the total percent of reconciling codes is calculated out of the total number of obligation codes per participant. The results of case studies are not meant to be generalized statistically (Yin, 2017); we report on these frequencies to provide a general sense of data trends.

Table 1: Distribution of Codes for Reconciling Obligations (N=35)

Teacher	Institutional vs. Individual Resolved in favor of		Institutional vs. Disciplinary Resolved in favor of		Institutional vs. Personal preferences Resolved in favor of the latter
	Institutional	Individual	Institutional	Disciplinary	
Diane	2	3	0	3	0
Olive	2	6	2	4	1
Nancy	1	4	3	3	1
Total	5 (14%)	13 (37%)	5 (14%)	10 (29%)	2 (6%)

As mentioned above, reconciling codes constitute only 7% of the total obligation codes; however, they are significant as illuminators of the tensions the beginning teachers encounter as they transition from university to school. Our data show that the main source of conflict for the participants along this journey was their *institutional* obligation. It appeared to clash primarily with either disciplinary or individual obligations and occasionally with participants’ beliefs, in our case, their desire to enact ambitious teaching in their classrooms. Similar to the observations in the literature (e.g., Bieda et al., 2015; Smagorinsky et al., 2004), the institutional obligation first surfaced at the beginning of the internship when the participants needed to adhere to the teaching practices and styles of their mentors. This obligation became even more pronounced during autonomous teaching since teachers had to assume additional responsibilities in their classrooms and adhere to the practices of their schools (Lampert, 1985; Windschitl, 2002).

Teachers reconciled in favor of the institutional obligation when they felt pressed for time, either in specific lessons or more broadly, with respect to the pace of the school curriculum and content standards, for example, when there was an expectation to follow the shared curriculum

and coordinate instruction amongst multiple teachers and classrooms. Additionally, the class size and the need to manage multiple students or groups inhibited teachers' perceived ability to go into conceptual depth on certain mathematical topics. In these instances, the teachers often had to compromise other obligations to ensure they were in line with the institutional expectations.

However, our data show that in the vast majority of situations (72% of reconciling codes) the conflict with institutional obligation was resolved in favor of some other obligation: disciplinary, individual, or personal preferences. On a side note, we did not encounter cases of institutional obligation clashing with interpersonal obligation. This may be due to the overall low frequency of reconciling codes within the data set; an observation that bears future exploration.

The beginning teachers reconciled in favor of *individual* obligation, in situations in which they felt the curriculum did not support students' classroom engagement. Nancy strived to include more "fun" and "interactive activities" breaking away from the "worksheets and review" routine. Diane devised tasks to make procedures "manageable" and "not too hard" for students, but without compromising problem-solving and "without lowering expectations too much." For Olive, reconciling institutional and individual obligations in favor of the latter was realized in developing heightened sensitivity, "a pulse" in her terms, to students' feelings. She talked empathically about how she can suspend the institutional obligation to the pace of the curriculum to accommodate a student who is stressed or maybe "just not having a day."

Additionally, all three teachers found ways to uphold the *disciplinary* obligation when it conflicted with the institutional obligation. This was apparent in the teachers' expressed desire to enact ambitious teaching practices. This took the form of integrating exploratory activities for discovering mathematical rules and relationships. Olive talked about doing "explorations" to justify the rule of 'flipping the inequality sign,' while Nancy integrated an activity about discovering the value of Pi despite its loose connection to the ongoing curriculum topic. The obligation to engage students with disciplinary practices took the form of engaging students with disciplinary mathematical values and practices, like free exploration (Diane), reasoning and justifying (Olive), and allowing students to choose which solution method they want to pursue (Diane). Reconciling the tension in favor of disciplinary obligation did not come easy but took the form of *small* steps like "tweak[ing] things ever so slightly" or doing "little explorations."

Our findings illustrate the strong influence of institutional obligation on the day-to-day work of teaching and the pressure it imposes on beginning mathematics teachers. While the literature suggests that beginning teachers tend to gravitate toward traditional teaching practices in their schools (Gainsburg, 2012; Windschitl, 2002) we are encouraged by our results showing the ability of these beginning teachers to navigate institutional obligation without caving into it.

These findings shed light on the complex situations beginning teachers face as they transition from the idealized setting of their teacher preparation programs into the challenging realities of school teaching. The theory of practical rationality and the four professional obligations (Chazan et al., 2016) help to conceptualize these transition processes as the *socialization* of beginning teachers into the teaching profession during which teachers adopt a particular decision-making framework that makes their classroom practice manageable (Herbst and Chazan, 2011). Teacher educators can build on these conceptual tools, and on the results of the current study, to support future teachers in retaining ambitious teaching practices in the institutions of schooling.

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