

# IMPACT OF THE PANDEMIC ON OU'S STEM MATHEMATICS PATHWAY

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**Abstract.** Using an organizational development framework, we consider different aspects related to first-year mathematics courses leading to STEM fields. We use the Weisbord six-box model to describe how the pre-pandemic structures and mechanisms helped our instructors weather COVID-19 and how changes were implemented to cope with the challenges faced. Certain practices adopted at the height of the pandemic are still in place, while others are not. We share this information as well as some of the innovations that were used to build relationships and provide informal rewards, two key aspects that are often overlooked. We also share some of the documented trends, continued challenges, and lessons learned.

**Keywords:** organizational evolution, mathematics department, first-year mathematics, pandemic impact

## 1. Introduction

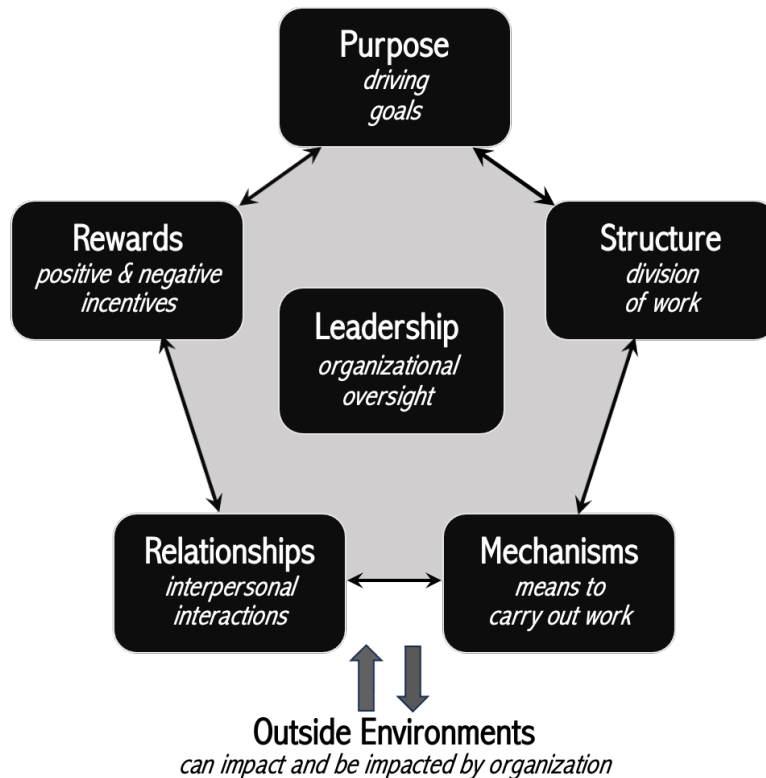
Success in mathematics is vital for students pursuing Science, Technology, Engineering, and Mathematics (STEM) majors [12]. To help STEM-intending students achieve success, many efforts have been implemented in post-secondary mathematics up to and including calculus [8, 13]. In this paper we report on the efforts at one institution.

It is important to see the university as a complex system recognizing that effective change strategies must be designed for compatibility with such an interconnected, multileveled system [4]. As others [1] have researched their home institutions, in this study, we look at the University of Oklahoma (OU). We build on the findings of [7] to explain the role that the pandemic had initially on OU's College Algebra, Precalculus and Trigonometry, and Calculus 1 courses. To do this, we set the context and then use a variety of information sources to paint a picture of recent revisions, ongoing challenges, and the decisions made to address them.

## 2. Theoretical Framing

We use the Weisbord six-box model [14], displayed in Figure 1. This model is used as a tool to help focus on different aspects of an organization that is under analysis. As such, it provides a good framework to consider departments in general, as well as more particular cases such as the three-course STEM sequence under investigation before the pandemic, during the height of the pandemic, and now. When one of the six boxes is mentioned, it will be italicized to signify to the reader how the theory is leveraged.

Figure 1. Six-boxes for organizational diagnosis, adapted from Weisbord [14].



*Purpose* includes the organization’s driving goals. This is where one determines if an organization is accomplishing what it set out to do. *Structure* refers to how the work is organized and divided up so that the organization’s business can be carried out in a manner that takes advantage of the organization’s strengths. It includes the roles and duties assigned to organization members. The *mechanisms* involve the organizational tools, processes, and systems that help govern how business is conducted. They include the established means that facilitate how an organization works (e.g., budgeting, planning, policies, procedures) as well as the technologies that are used to conduct business. *Relationships* address interpersonal interactions, communications, collaborations, and factions within organizations. This includes differences in power and how the organization manages conflict between individuals. *Rewards* include both formal incentives (e.g., pay raises) and informal incentives (e.g., peer approval) that motivate individuals. *Rewards* are usually considered positive motivators, things that serve to demotivate individuals also fall in this box. *Leadership* involves those in the organization who oversee the coordination of the other five boxes so that all remain in sync with each other.

An organization does not operate in a vacuum. Instead, it can impact, and be impacted by, multiple *outside environments*. There are environmental factors, such as the COVID-19 pandemic, that had repercussions in all aspects of society.

### 3. Methods

To look at OU's STEM math pathway three-course sequence (i.e., College Algebra, Precalculus and Trigonometry, Calculus 1), we consider changes that occurred from the onset of the pandemic to present. We use multiple data sources including meeting agendas, course materials, administrative documents, student enrollment and pass rate data, course evaluation comments, and tutoring attendance records.

The narrative that follows is a compilation of the data sources but also of the lived experiences of the two authors, who serve as the First-Year Mathematics (FYM) Director, who leads all FYM endeavors including general oversight of the tutoring offered by the Mathematics Department, and the Chair of the Mathematics Department at OU. Both have been in what might be considered these lower-tier administrative roles (as opposed to those in higher positions, such as a Dean or Provost) since prior to the height of the pandemic and have the "prolonged engagement and persistent observation" [3, p. 207] that is recommended for qualitative research. For this reason, both fall in the *leadership* box of the six-box model [14], since both oversee different aspects endeavors that comprise OU's STEM math pathway three-course sequence. So, the paper is written through the *leadership* lens of trying to attend to all the other boxes. As with an organization of sufficient size, there are different levels of *leadership*. We include information on coordinators below, who acts as leaders in more localized contexts, as does the Math Tutoring Center Director, all of whom fall under the leadership of the FYM Director and Department Chair.

### 4. Background

#### 4.1. Institutional Context

OU is a public research university. In Fall 2018 the main campus had 26,165 students, of which 22,170 were undergraduates with 5,035 incoming freshmen. In Fall 2020, there were 21,393 undergraduates with 4,945 incoming freshmen. In Fall 2022, there were 21,294 undergraduates with 5,134 incoming freshmen. Over half of the incoming freshmen are typically from Oklahoma and over a quarter from Texas. In Fall 2022, 56% of the student body identified as white, 37% as minorities, and 6% as international.

Incoming STEM students at OU typically enroll in College Algebra (CA), Precalculus and Trigonometry (PC), or Calculus 1 (C1) courses since non-STEM majors are served by different math courses. About 30% of the incoming freshmen enrolled in CA, PC, or C1 courses in the fall of their first semester. Recently, about 60% of the C1 students are engineering majors with about 25% natural science majors and 1% mathematics majors.

## 4.2. The “Organization” and Its *Purpose*

For this study, we define the organization to be the OU Department of Mathematics, specifically focusing on its CA-PC-C1 course sequence. Using the department as an organization is logical considering Reinholz and colleagues’ [10, 11] claims that change efforts should occur at this level. Departmental change actions are often more sustainable than efforts that come from higher administration or grassroots efforts, since they are more likely to shift departmental culture and support pedagogical change [5].

The *purpose* of the CA-PC-C1 sequence has remained stable over the period of the study. Our<sup>1</sup> driving goal for the three-course STEM sequence is to engage students in meaningful mathematics activity by building on their thinking and experiences in ways that allow them to actively process the foundational mathematical ideas [6] that they will need in future STEM courses. This would be a sub-goal of both the FYM Program, which also offers courses to non-STEM majors, as well as a sub-goal of the Mathematics Department, which has goals that extend past the level of foundational mathematics. To achieve this goal, we<sup>+</sup> have tried to attend to all seven recommendations for calculus courses [2] as detailed in [7].

## 4.3. Previous work

In this paper, we extend the previous study of OU’s CA-PC-C1 sequence conducted just prior to the pandemic [7]. In [7], we<sup>+</sup> discussed key changes of the teaching of math courses leading to STEM fields from Fall 2014 to Spring 2020 and the creation of a FYM Program, all in the light of the recommendations from the 2015 MAA National Study [2]. In this period, we<sup>+</sup> hired several renewable-term “teaching” faculty, introduced course coordination, and expanded instructor and tutor training. We<sup>+</sup> regularly collect data about students’ grades in each FYM course and the subsequent FYM course and track FYM course enrollments and Math (Tutoring) Center attendance, which allows us<sup>+</sup> to make informed decisions.

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<sup>1</sup> Following Apkarian, Bowers, O’Sullivan, and Rasmussen (2018), *we* and *our* refer to the two authors; *we<sup>+</sup>* and *our<sup>+</sup>* refer to some nonempty subset of the two authors and others, typically mathematics department members, working at OU.

## 5. Findings

We have described the *purpose* and *leadership* boxes. We turn to the remaining boxes: *structure*, *mechanisms*, *relationships*, and *rewards*.

### 5.1. Structure

We first consider the *structure* of the CA-PC-C1 sequence, focusing on the positions, communication system, system for onboarding TAs, course coordination system, and course offerings available. Having a *structure* with well-defined duties in place prior to the onset of the pandemic was essential in how we+ were able to carry out our+ functions during the pandemic.

#### 5.1.1. Structure: Pre-pandemic

Each of the three courses (i.e., CA, PC, C1) had a coordinator, a teaching track faculty member with at least five years' experience teaching mathematics at OU. All three courses, and many others, were served by the Math (Tutoring) Center, which was overseen by a Director with over 20 years experience teaching mathematics at OU. The coordinators and Math Center Director reported directly to the First-Year Math (FYM) Director, who in turn reported to the Department Chair. The course coordination for CA, PC, and C1 involved a common textbook, a common syllabus, a common topic schedule, common exams, and regular instructor meetings.

These three course coordinators, along with the course coordinators from our non-STEM courses, the Math Center Director, and the FYM Director formed the FYM Leadership Team. The FYM Director worked with the Graduate Director in the department to plan and oversee the August Teaching Assistant (TA) training for TAs in their first two years. The FYM Leadership Team members led the training workshops.

There was a specific trajectory that graduate TA assignments typically follow. New TAs were assigned to serve as C1 recitation section leaders while tutoring for calculus in the Math Center. After one or two semesters, TAs were then assigned to teach CA as instructors of record; so, CA was rather rigid in its coordination with the use of a daily topic workbook. After teaching CA, TAs then could serve as instructors for PC, which heavily emphasized collaborative group work. After teaching PC, TAs were eligible to serve as C1 instructors.

#### 5.1.2. Structure: During the Pandemic

Most of the aforementioned *structure* continued during the pandemic. In March 2020 once a decision for OU to go fully online was made, the FYM Leadership Team members pooled their collective knowledge to make sure each member was well-versed in Zoom. The coordinators communicated pertinent information to instructors. It was crucial to have an existing *structure* with qualified people in well-defined roles to navigate the communication that was needed

during the “Great Pivot” of March 2020. The communication tree *structure* allowed for efficient information flow between the Chair and the instructors on the front lines, which was so crucial at the time. For example, an instructor might notify a coordinator of an issue. The coordinator would then contact the FYM Director, who would talk it over with the Chair to determine possible solutions. These solutions were then pushed out to all coordinators so that they, in turn, could relay the information to all their instructors.

The TA training in August 2020 helped prepare our+ graduate students in their first and second years for the challenges they would face as tutors, discussion leaders, and instructors. Having a planned sequencing of assignments for TAs, with the telescoping levels of responsibility, was beneficial. No one in the incoming cohort of TAs in the Fall 2020 semester was expected to serve as an instructor of record. While they did serve as C1 recitation leaders, this role carried much less responsibility when dealing with absenteeism, makeup requests, integrity violations, and other issues that mushroomed during the height of the pandemic.

### **5.1.3. *Structure*: Present**

We+ recognize how difficult it would have been for the department to weather the pandemic without coordination and TA training. However, the pandemic brought to light the fact that some adjustment to the existing *structure* was needed. While the basic *structure* remained; some minor changes were implemented. The department has now moved to having both coordinators and co-coordinators (i.e., teaching faculty who were not coordinating a course) for all FYM courses, including CA, PC, and C1. The coordinators played a key role during the pandemic, and it was recognized how much of a load they carry. When coordinators were out (e.g., due to illness of their own or a family member), as happened during the pandemic, there were interruptions in communication. Moreover, when they did need to be out, the coordinators often tried to work when they had other important matters or their own health to which they should have been attending. So, the addition of co-coordinators allowed for another person to help coordinators with their duties while allowed the co-coordinators to learn from coordinators what these positions involve through informal mentoring. Also, we+ are losing the CA coordinator in Fall 2024; she is taking a more lucrative position in engineering. Having coordinators mentoring co-coordinators allows for more sharing of course-related tasks, smoother transitions when coordinators need to be temporarily absent, and transfer of institutional knowledge with less fluctuation should a coordinator leave.

Since the pandemic, digital resources have taken on a permanent role in instruction. All courses are now expected to have an online presence in the learning management system, Canvas, adopted by OU. The university no longer closes, but now switches to virtual days, when there is severe weather. Due to these recent shifts in expectations for course format and delivery in all mathematics classes, a new position of departmental Instructional Technology Coordinator was created and assigned to a member of the FYM team who had excelled in helping others use digital resources during the pandemic. This person plays an integral part in the TA training and

offers training to incoming postdocs, incoming faculty, as well as seasoned faculty in need of additional support adapting to new expectations.

Another artifact of the pandemic is that many K-12 students experienced interrupted instruction. At OU, we+ are finding a number of STEM majors are placing into developmental mathematics courses rather than CA, PC, or C1. For this reason, we+ have changed the *structure* and are now offering corequisite entry courses. In the STEM pathway, this means that students who miss the placement cutoff for CA by a few points are now able to enroll in certain sections of CA that are linked to an additional 1-hour course taught by the same instructor and are thus able to complete the CA course with just-in-time remediation of key prerequisite topics.

In Oklahoma, the pandemic also shed light on the limited mathematical opportunities that high schoolers in many rural communities have. For that reason, OU will be offering online concurrent course offerings where high school students can take OU classes, including CA, in Fall 2023. This is a case where there is a layering of *outside environments* that are impacting and being impacted by our+ department.

## **5.2. Mechanisms**

Whereas *structure* addresses how work is divided up and who does what; the *mechanisms* box, that we now outline, explain how the work is actually carried out.

### **5.2.1. Mechanisms: Pre-pandemic**

Regular meetings and shared access to information and policies have been a hallmark of FYM at OU. The Chair and FYM Director met weekly, and the FYM Leadership Team met monthly. Meeting agendas, which are digital documents accessible and editable by all, were sent in advance and contain hyperlinks to records of FYM practices and protocols. Coordinators held instructor meetings (weekly for CA and PC, biweekly for more experienced C1 instructors) to go over upcoming material, review common student issues, and prepare assessments and associated rubrics. CA instructors were encouraged to use group work. PC instructors were required to use inquiry and collaborative learning activities. Active learning activities were made available for C1 instructors and recitation leaders.

Each of the courses in the CA-PC-C1 sequence offered three common midterms and a common final. To support courses, the Math Center offered reviews and “After Dark” sessions (i.e., evening tutoring offered on the nights before coordinated exams in physical locations adjacent to the dorms, where most freshmen live). A Math Center Tutor Handbook, given to each tutor to outline policies, was distributed during new tutor training at the beginning of each fall semester. Math Center attendance, collected via a swipe card system, was updated weekly so that trends were easily monitored. In the spring when fewer instructors of record are typically needed, TAs who excelled in tutoring served as area leaders mentoring all tutors, especially new tutors

who did not attend fall training. Data on Math Center attendance, both for tutors and students coming for tutoring, were collected. The data trends were used for scheduling and hiring.

There was other systematic data collection and sharing in FYM. Coordinators reported on the results of major assessments and provided instructor reviews. Instructors, in turn, evaluated courses and coordinators. Data on student attrition and success in future courses was gathered and recorded, along with other pertinent data (e.g., enrollment), in an annual Math Factbook, which was distributed to administrators at the Dean's level in the Colleges of Engineering and Arts and Sciences.

### **5.2.2. Mechanisms: During the Pandemic**

While most *mechanisms* mentioned above did not vary, some have. In March 2020, all classes, tutoring, and meetings moved to online meetings. The August TA training and all fall semester meetings were held virtually. New protocols had to be put in place since the boundaries of professionalism were pushed (e.g., people attending meetings but not turning on their cameras, people having their cameras on while obviously engaging in distracting activities). It was determined that conduct in virtual meetings should be similar to conduct in face-to-face meetings. While possible for meetings, it was not possible to impose such protocols for online instruction.

Online instruction reverted to primarily traditional lecturing in Spring 2020, immediately after the Great Pivot, as instructors tried to survive in this new learning environment. FYM Leadership meetings became more frequent, focused on the needs of instructors, and became a space to share ideas. Many ideas brought to the group came from the *Student Engagement in Mathematics through an Institutional Network for Active Learning (SEMINAL)* meetings, and this network provided an excellent way to gauge how OU was faring. Many ideas also came from searching online and talking to other educators. The FYM Leadership team collaboratively explored different online homework platforms (e.g., MyOpenMath) that provided quick feedback to students, video discussion venues (e.g., Flip, formerly Flipgrid) to give students a voice and allow them to hear others, collaborative digital spaces (e.g., Jamboards) to encourage group work, digital student response tools (e.g., Top Hat) to provide formative feedback to instructors and students. Features of the Canvas learning management system were discussed, especially in coordination with features of Zoom such as allowing student participation and engagement (e.g., breakout rooms, polling, students posting to the chat for participation credit).

While a few FYM team members tried adopting new digital resources in the spring, most coordinators ruminated over what seemed best for their courses, and more adoptions rolled out in the fall. In Fall 2020 through Fall 2022 every FYM course with more than one section offered at least one of those sections online. This way, if students needed to take an extended absence from class (often due to illness or caring for a loved one who was ill), they were allowed to shift from an in-person to an online section.



We+ were more prepared for online instruction in Fall 2020. The CA and PC courses used pre-lecture videos for both in-person and online classes. The CA coordinator encouraged the use of the collaborative tools in the Google suite of applications and adopted MyOpenMath, which was free to students but relatively easy to use. The PC instructors used Google Jamboards for collaboration and Flipgrid to post videos. In C1, the coordinator switched from using Clickers in class to using Top Hat, and facilitated other instructors who wished to do the same; about half decided to do so. She also used and encouraged other instructors to use Flipgrid for students to explain their reasoning.

Absenteeism was high. So, for each course, instructors dropped the lowest 20% of assignments, without the need for any official documentation. Also, instructors gave assessments so that each assessment was worth less. For CA assessments, the coordinator automatically dropped the lowest exam, and exams were given less weight. In PC, the coordinator helped instructors return to group work, even in an online learning environment using virtual breakout rooms, shared work spaces, and collaborative online documents. All PC sections move from midterm exams and a final exam to multiple quizzes allowing repeated retakes and a final presentation. The C1 course implemented four midterm exams.

Assessments in online environments were difficult, but the FYM team collaborated to determine the best means for exams. Coordinators adopted online homework platforms that provided formative feedback to students and allowed repeated submissions. The exam questions were randomly sorted as were the answers to multiple-choice questions. Questions were locked after their answers were submitted.

Starting in Fall 2020, all FYM coordinators generated and shared their instructional continuity plans, in case an instructor is absent, with the other FYM Leadership team members. In CA, where our+ most novice instructors teach, a substitute instructor system was put in place to cover instruction in the same format. In PC and C1, where the instructors were more experienced, they were allowed to move their in-person sections online, if the need to quarantine arose. However, if PC and C1 instructors were too ill to teach, the coordinator helped organize substitute instructors to cover the course section. With the increased workload that coordinators faced, instructor observations were reduced to only when complaints or concerns were raised.

Both weeks of TA training were offered virtually in August 2020. In August 2021, the first week of training was offered online, then the second week was offered in person. Tutor training was offered in person both years. For both TA and tutoring training, special sessions were included on how to work in virtual environments. There was also a shift to keep the Math Center, which sees a lot of traffic, safe. Safety measures were implemented in the busy Math Center, e.g., in-person math tutoring in 2020-21 utilized small personal whiteboards that were cleaned after each person.

In March 2020, the Math Center shifted to online tutoring. From Fall 2020 to present, it has offered both in-person and online tutoring, with the hours of available online tutoring being scaled back each semester. The Math Center moved to online reviews and eliminated After Dark review sessions for a while, bringing the After Dark review sessions back in 2021. Data were

still collected; however, we+ recognized that the patterns and trends that had held previously were not expected. The online math tutoring had to find a new system for collecting attendance data that involved inputting student ID numbers rather than using the swipe system.

The *mechanisms* we+ had in place, and the support and information we+ received as part of the SEMINAL network were crucial in the difficult landscape of pandemic instruction. The Oklahoma Online Excellence Award (in the category of Team, Program, or Institution) was awarded to OU's FYM Program by the Oklahoma State Regents of Higher Education's Council of Online Learning Excellence in 2021 as a testament to our+ efforts during the height of the pandemic.

### **5.2.3. Mechanisms: Present**

We+ have learned from the past and have tried to reinstate or alter *mechanisms* to provide the best options for all. C1 has reverted to having three midterms, but now the fourth exam slot is used to retake the student's choice of the previous midterms. The Math Center evening reviews before exams for CA and C1 are still offered online (to benefit off campus students), but the in-person tutoring the night before exams near the dorms has been reinstated. PC did not have exams; so, there were no PC reviews in Spring 2023. Almost 25% of the instructors in CA, PC, and C1 offered their office hours online in Spring 2023, but this number decreases each semester. During the pandemic, we+ recognized the importance of engaging students (when it became difficult to do) and are working to keep class sizes smaller (<30) and more even across sections in both CA and PC. Only the coordinators and other veteran teaching faculty have double sections in CA and PC. Lastly, instructor observations were reinstated for all new instructors.

The FYM Leadership Team still meets, but there are now meetings that are open to others involved in the FYM program. We+ currently hold a FYM instructional team meeting every semester for all FYM course instructors and recitation leaders. We+ are giving teaching faculty, even those not in coordinator roles, more input on policies. In Spring 2023, copies of the book *Don't Reply All* [9] were disseminated to all FYM teaching faculty for a series of "Read and Feed" meetings where they met to discuss a book on email communication over snacks. In the final meeting, we+ established the email protocols that are now in place.

We+ still make data-driven decisions, but recognize that the 2020-21 and 2021-22 academic years are an anomaly. Math Center attendance is slowly starting to rebound, but is still only about 60% of pre-pandemic numbers.

We track DFW rates and are noting more attrition than before the pandemic. The DFW rates across all FYM courses correlate with the student absenteeism, which has been an issue. We also track student performance in the subsequent class. It was noted that students in PC were underperforming in C1 compared to other transitions in the CA-PC-C1-Calculus 2 course sequence. So, a recent decision was made for PC to return to having a final exam and to reduce the number of quizzes with one (rather than repeated) retake opportunities starting in Fall 2023.

It is unclear if PC's frequent quizzes cut into instructional time or if having numerous opportunities had a negative impact on students' learning retention or studying habits.

### **5.3. Relationships**

#### **5.3.1. Relationships: Pre-pandemic**

Many of the *mechanisms* in place helped foster *relationships*. The FYM team meetings provide a means for coordinators across different courses as well as the Math Center Director to discuss key issues with each other and the FYM Director. The coordinators all held regular instructor meetings to discuss issues that were pertinent to their particular courses. These *mechanisms* and others (e.g., tutor training, providing a communal office for incoming TAs, and the use of TAs as mentors for new tutors) helped establish and sustain *relationships* between instructors, TAs, and undergraduate students. The department also organized a Welcome Banquet in early fall, holiday dinners, and an Awards Banquet in late spring where TAs, FYM teaching faculty and other members of the Math Department socialized.

#### **5.3.2. Relationships: During the Pandemic**

While none of the formal relationships changed, the spaces in which relationships were nurtured changed dramatically. The *relationships* during the pandemic were more strained. This strain extended well beyond moving to digital platforms for meetings; although there seemed to be general agreement that it was harder to establish *relationships* over Zoom meetings than in person. The instructor/student *relationships* that help form a classroom community were much harder to develop in online environments. The lounge and copy room conversations as well as the conversations that naturally occur from having offices in close proximity disappeared. These informal, interpersonal communications had helped TAs, teaching faculty, and other members of the Math Department come together as they discussed educational issues as well as other common interests outside of teaching and learning mathematics. *Relationships* with family became more important, and we+ lost several part-time instructors.

The requirements to carry out our+ *purpose* required significantly more work. COVID-19 took a toll on all, especially those whose family members became ill, those with pre-existing health concerns, and those with small children. The spectrum of opinions, often related to politics, on personal liberties versus social responsibilities was a microcosm of what was seen across the US.

In-person social events were absent. Our+ Graduate Director visited a graduate student each week, brought pizza, and met virtually with the other TAs. In Fall 2021, we started hosting a departmental picnic every semester, which helped us+ meet colleagues' (both faculty members' and TAs') families.

### **5.3.3. Relationships: Present**

Even though we+ resumed all in-person events, the impact of the pandemic is still felt. The shift to working from home has impacted the number of instructors and students who hang out at the building where most math classes are offered and where the Math Center is located. To try to bring about more camaraderie, the FYM team now organizes additional end-of-semester events. For example, during finals week in December, the FYM office plays holiday music, offers hot cocoas, has a digital fireplace, and snowman puzzles on the conference table. Such events are *mechanisms* we have implemented to help foster *relationships* among the FYM team members.

Sections about "relationships" and "rewards" seem a little less detailed. For "relationships", is there anything else to say about things like proximity of offices among organization members, or how any meetings are organized to encourage discussion? Also, would the note about email communication fit well in this section, since "relationships" address interpersonal communications? And for "rewards", would there be anything to add about the credit that leadership or coordinators (or co-coordinators) receive for their extra effort (e.g. course releases)?

## **5.4. Rewards**

### **5.4.1. Rewards: Pre-pandemic**

Pre-pandemic there were no formal *rewards* for FYM instructors. At the departmental level, we+ gave awards to a few TAs who excelled in their teaching; although many of the awards are earmarked for mathematical research.

### **5.4.2. Rewards: During the Pandemic**

It became apparent that informal *rewards* were needed to let the FYM instructional team know that their efforts were appreciated, especially in challenging times. Twice a semester, the FYM Director began sending out small tokens of appreciation (e.g., cards with Irish breakfast tea to all FYM teaching faculty at St. Patrick's Day). She gave them work-related gifts at the end of each semester (e.g., backpacks with self-care journals, canvas totes with math puns, personalized coffee mugs). This concentrated effort to give relevant gifts to bolster spirits continues today. However, the FYM team was not the only group impacted by the pandemic. So, we began a Gratitude Garden Party for those in key support roles (e.g., the Academic Integrity staff, the course scheduler) with snacks, music, and potted plants distributed to attendees.

### 5.4.3. Rewards: Present

The *rewards* put in place during the pandemic continue. However, the Gratitude Garden Party is now held in the FYM office with artificial turf and flowers on the conference table. We moved this event indoors to get people back in the building talking to each other. So, we are leveraging informal *rewards* to encourage *relationship* building.

The FYM Director now offers food at meetings that extend for two hours or more or when a person attending will be in back-to-back meetings or classes. This is one way that the FYM team members know their efforts, especially for coordinators who are in those roles as part of their assignments and not for additional compensation, are appreciated and their needs matter.

In Spring 2023, OU announced merit pay raises where only certain percentages of faculty will be given raises. While this might encourage productivity, there is a concern that this formal system of monetary *rewards* might negatively impact the *relationships* we are trying to solidify as faculty might interpret the situation as being one where they are competing for limited financial incentives.

## 6. Conclusions

The pandemic challenged our+ efforts to implement active learning strategies in CA-PC-C1. However, having specific *structure* where roles were well-defined and the *mechanisms* to share information, train incoming TAs and tutors, and give all FYM team members a voice helped. During the pandemic we+ adopted procedures that were more flexible to deal with hardships that students and instructors faced. We+ continue to use some procedures and ideas from the pandemic but ultimately rely on student data to determine which procedures benefit students. During the pandemic, we+ tried many new digital resources and still employ those found useful.

Virtual review sessions and online tutoring provide opportunities for all students to use our+ free tutoring services; however, we+ have not yet rebounded to the pre-pandemic attendance at OU's Math Center. We+ know that student class attendance remains an issue and are looking for ways to improve this. It is hard to engage students who are not present. We+ continue to benefit from connections made in professional networks, acquiring new ideas for mathematics instruction. It has also been helpful to glean information from other institutions that OU is not alone in dealing with student attendance issues (both for classes and at the tutoring center).

While specific structure and mechanisms are vital, the first key lesson learned were that we often take for granted that there is a need to continue to foster *relationships* among the FYM team members. They need to feel connections to their students, to each other, and to others in the Mathematics Department. A second key lesson is that people need to feel appreciated. We found that it is very important to engage intentionally in offering informal *rewards*. When times were difficult, we leaned on *structure* and *mechanisms*, but in the end the efforts that addressed

*relationships* and *rewards* seemed to be what helped get us+ through. We have much to learn but feel the six-box model helps monitor different aspects of the CA-PC-C1 course sequence.

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