Pathways Collaborative Equity Grant

Final Report

Making the Path by Walking It

Carnegie Math Pathways-Inspired Video Cases for College Mathematics Instructor Professional Growth

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Executive Summary

Project goals

Develop and pilot equity-centered, professional learning activities

- rooted in real college mathematics video vignettes,
- scaffolded for challenging conversations about equity, and
- useful for instructors and institutional leaders.

Case content. First Impressions Last (preparing for the first day of class); Whose Math Is It? (student engagement in group learning); Making the Grade (the instructors' role in grading).

Case format. Each video case has a core 30-minute activity as well as enrichments to support 60-minutes or more of exploration and discussion anchored in one or more video vignettes (each video clip is 2 to 7 minutes long). Core and enriched activities have a common format:

- Preview prompt(s) to direct attention,
- View prompts to shape conversational intention,
- Discuss prompts to guide focus of the conversation,
- Reflect prompts to support decentering and future-self imaging, and
- Monitor progress and extend prompts to engage continuing intellectual effort.

Discussion tools. Equity work requires moving away from ego-/ethno-centric and toward ego-/ethno-relative approaches to understanding and interacting with others (Bennett, 2004). Case activities use a variety of techniques for this kind of decentering. Discussion tools were created in this project to support productive exchanges (e.g., to be used by people participating in a discussion and a case activity facilitator). The three tools are:

- A brief reading about the power of language that may be unfamiliar or uncomfortable but supports clear communication about social constructs (e.g., race, gender).

- Four agreements for challenging conversations from Singleton & Linton (2006):
  - stay engaged,
  - expect to experience discomfort,
  - speak your truth, and
  - expect and accept a lack of closure.

- Personal self-awareness-building through a Safe—Comfortable—Brave Venn diagram.

Calling for people to decenter does not mean suddenly being without ego! The tools acknowledge the experiences of each person. The Venn tool is particularly useful for action and accountability in conversations when sufficient trust (or anonymity) exists for people to let others know the nature of their current experience – to share their truth – across power and status divides (e.g., when discussants are instructors, faculty mentors, and administrators).

What do users get out of cases? The research points to three key benefits: (1) awareness of gut responses enables identification and regulation of them; (2) examining and responding thoughtfully to a complex situation that has no ideal resolution engages a kind of meta-cognitive rehearsal of process that later, in the immediacy of a new experience, can be called to mind for use; and (3) case users see themselves as intentional agents in the orchestration of their professional environment rather than victims of circumstance.

Background

The Carnegie Math Pathways materials for college students, professional development for instructors, and associated Networked Improvement Community (NIC) of instructional leaders and administrators is a systemic effort to shift from an ethic in college mathematics of "make it by surviving" to "pathway for thriving." The Carnegie Math Pathways play a central role in broader Guided Pathways reform by offering a streamlined set of mathematics course options aligned to postsecondary and career success and by building upon and extending the instructional and administrative practices that form the core of the Carnegie Math Pathways program – to explicitly examine and addresses issues of equity.

Nonetheless, it is difficult to understand something one has never seen. For most instructional leaders in this country, equity is unseen, mythical. The project pulled together experiences of myriad college mathematics students, instructors, and leaders in video vignettes who offer glimpses of equity. Associated activities dig into and unpack what is (and is not) equitable in the focal situations. Supports for doing case activities provide the means for orchestrating equity-centered conversations that are challenging, purposeful, and consequential.

More than 17 million students in the U.S. are enrolled in college, and more than six million of these students are at community colleges (National Center for Education Statistics, 2017). These students are seeking an educational path toward a productive career and better life. However, many of them face numerous challenges. Community college students are more likely to come from low-income backgrounds, be the first in their family to attend college, or come from a group underserved by status quo K-12 education (Bailey, Jenkins, & Leinbach, 2005). Just as cases rooted in classroom video have supported instructional responsiveness among school teachers, equity-centered video case activities can support the professional growth of postsecondary instructors and leaders.

1.1. The Developmental Mathematics Challenge

Until recently, community college students took multi-course sequences, including elementary algebra and then intermediate algebra, to get into a college-level transferable class such as pre-calculus. This structure drastically hindered student completion (Ma & Baum, 2016). Guided Pathways have emerged as a means to dramatically improve students' college experience (Logue et al., 2019). They offer frameworks for

institutional and classroom-level reforms that ensure students are engaged in meaningful and relevant courses aligned to their future goals, that minimize their time to graduation, and that maximize their opportunity for goal attainment.

For many institutions, mathematics pathways – a streamlined set of options aligned to majors – are the starting point of a larger Guided Pathways reform. A decade ago, the Carnegie Math Pathways Networked Improvement Community was launched to unite researchers and practitioners in creating new math pathways (Quantway and Statway). These pathways use a systemic and networked approach to change, one that provides faculty with professional learning opportunities as well as support for administrators to create the necessary structural reforms and conditions to support math pathways.

Yes, the Carnegie Math Pathways are closing gaps in outcomes and, yes, similarly encouraging results are emerging for corequisite major-aligned approaches both with Statway and Quantway and other pathway methods (Logue, Douglas, & Watanabe-Rose, 2019). However, if educational equity is defined as

The process of identifying how disparities affect the educational opportunities of students based on marginalized social identities (i.e. race, gender, socioeconomic class, sexuality, age, citizenship, religion, physical and mental ability, etc.) and subsequently developing strategic solutions to take systemic action to redress these inequities (DeCuir & Dixson, 2004) through ongoing and sustainable efforts (Gorski, 2016) that are equity centered (source: Pathways Collaborative Equity Partners Fund website, 2018)

then further improvements in the equity-centered decision-making practices of faculty and institutional and instructional leaders are needed to ensure equitable access, opportunity, and outcomes for all students. Building on the successes of the Carnegie Math Pathways change approach, the equity video cases project has created challenging yet scaffolded professional learning activities for faculty and instructional leaders.

1.2. The Carnegie Math Pathways (CMP) Change Package

In improvement science, a "change package" is a well-defined, evidence-based set of ideas and metrics for a system known to produce a desired set of outcomes (Nembhard, 2009). The CMP change package consists of course structures, curricula, pedagogy, and professional development along with the systemic level work of a multi-institutional Networked Improvement Community (NIC). The Carnegie Math Pathways design is based upon a set of research-based program components. Video cases support the instructional and professional learning components.

Accelerated pathways. Rather than being faced with a maze of possible course options, students are offered an accelerated pathway that meets developmental math requirements and provides them with college math credit upon successful completion.

Mathematics content relevant to college, career, and citizenship. Both Quantway and Statway emphasize the core mathematics skills needed for work, personal life, and citizenship and stress conceptual understanding and its application in a variety of contexts.

Productive persistence supports for student engagement and learning. Integrated into the Pathways are tools and practices designed to increase student awareness and self-regulation of motivation, tenacity, and effective learning strategies, collectively called the Starting Strong package, which is based on evidence that many students who fail a course do so because they withdraw their efforts early or get too far behind to catch up by the end of the course (Vaquero & Cebrian, 2013). Starting Strong is a set of 10 instructor-led routines and interventions implemented early on in the course, typically the first month.

Reducing language and literacy barriers. Given the diverse backgrounds of students, supports and interventions are interwoven into the curricula and pedagogy to assist with the complex language and literacy demands of mathematics and its different forms of representation and grammar (Gomez, Rodela, Lozano, & Mancevice, 2013).

Pedagogy supporting deep and flexible mathematics understanding. This is an aspect that the new equity video cases were designed to support. Grounded in research on teaching for understanding and the development of mathematical practices, student and instructor materials emphasize productive struggle with challenging problems, deliberate as opposed to just doing routine practices, offer rich mathematical discussions, and highlight the multiple roles of individuals and collectives in mathematical sense-making (Esmonde & Langer-Osuna, 2013; Moschkovich, 2007).

Faculty professional development. This is an aspect that the new equity video cases were designed to support. A robust professional development system has been crucial as the Pathways have moved from early adopter colleges and faculty to institutional contexts with more adjunct and inexperienced faculty as well as limited institutional capacity. Developed with NSF funding (DUE-1322844), faculty support was created within Pathways for instructors to work with the NIC to improve practice (Edwards, Sandoval, & McNamara, 2015). It prepares faculty to teach a Pathway for the first time and scaffolds the first year with (1) hands-on preparation workshops, (2) ongoing and regular support from Faculty Mentors, and (3) online instructional resources. Faculty activities include video-based conversations about practice. Activities revolve around jobs to support addressing emergent problems of practice. There is also time during the sessions for collaborative reflection by instructors and faculty mentors who are centered in classroom practice.

Site-level organization. This is an aspect that the new equity video cases were designed to support. The primary liaison between the CMP faculty support team and college teams is the Faculty Facilitator, a faculty member identified by college leadership. The Faculty Facilitator coordinates course creation and customization for the college and works with Pathways staff and a Faculty Mentor to plan and execute local supports for faculty. Each college team also identifies a Primary Administrator who leads local implementation and works with the Faculty Facilitator. Finally, in addition to a Faculty Mentor, each college team is supported by an Administrative Coach, an experienced Pathways college administrator who provides support for administrators in their implementation roles using a formal improvement approach.

Engaging in improvement as a network. This is an aspect that the new equity video cases were designed to support. A distinctive feature of the Carnegie Math Pathways effort is that institutions that implement the Pathways are organized as an NIC, facilitated by the network hub at the Carnegie Foundation. Within NICs, teams from member colleges agree to collectively address the shared challenge of implementation using the methods and tools of networking and improvement science (LeMahieu, Edwards, & Gomez, 2015). Teams of NIC members (e.g., faculty, chairs, deans, and Carnegie hub staff) work together to identify and address specific improvement goals. A number of teams run improvement projects in any given year. To date, the NIC activities have included conversations based in classroom video about aspects of inclusion and diversity, but they have not been systematically equity-centered.

1.3. Purpose

The purpose of the project was to develop and pilot equity-centered learning activities that are

- rooted in video clips from real college mathematics classrooms and instructor meetings,
- scaffolded for challenging conversations about equity, and
- useful for instructors and institutional leaders.

Design and Methods

The project used existing and new video to develop three video cases that give voice and recognition to the diversity of people who contribute to and benefit from the CMP approach. Each case includes video vignettes and activities for professional learning by instructors, faculty mentors and coaches, and institutional leaders. As with the college video cases for mathematics instructor development on which we based the design (more on this below), the use of, and lessons learned from, these new cases are transferable across disciplines. In particular, case use for professional learning by institutional and instructional leaders has broad impact across an institution's Guided Pathways reform effort beyond mathematics. Changes in institutional practices and policies sparked by attention to mathematics pathways can be consequential for all pathways.

2.1. Video Case Packages

A case is not just a short story; it is a context-rich description in words or images or both, which highlight a dilemma, challenge, or epitome (e.g., good or not-so-good practice). An effective case generates dissonance between what users thought they knew to be true and what they are witnessing. Such cognitive dissonance is the basis on which new understanding is constructed (Seguin & Ambrosio, 2002).

Each video case-based set of activities, also known as a case package, was designed using well-established principles for structure and guidelines for format (see Table 1). Creating a video case package requires prompts for the viewer that depend on the content of vignette(s), the degree to which each is experienced as intellectually and psychologically intricate, and the method of response (e.g., writing, discussing). Prompts may call upon the viewer to engage in complex synthesis, evaluation, and analysis of multiple sources of information but can also be as simple as asking participants to describe the problem in as much detail as possible. What might you do to address such a situation? Illustrate your strategy with specific examples from the vignette or personal experience. What would be the risks and the consequences of your strategy, if any?

Table 1. Principles and Guidelines for Case Development

Principles for Vignette Development

1. **Timing.** The vignette ends unresolved. If it leaves a significant conflict at its height, then the case is often referred to as a "problem" rather than a "case."

2. **Content.** The details are authentic to the reader/viewer.

3. **Multiple solutions.** Many resolutions are possible though few, if any, are ideal.

4. **Relevance.** The context for the case is realistic and recognizably legitimate.

5. **Validity.** The content of the case is a common occurrence; often, leaving it unresolved may mean having to deal with other (perhaps worse) issues.

6. **Tension.** The situation or context is rich in social, emotional, or psychological impact (though not so much so as to polarize, particularly among novices).

Guidelines for Case Prompts

1. **Framing.** Analyze different interpretations of the conflict or situation.

2. **Strategizing.** Evaluate the actions of the case participants and of oneself; consider how intentions are turned into actions in a variety of ways.

3. **Connecting.** Identify and relate personal experiences to the case experience.

The case development process is described below in section 2.2 below. Additionally, for the nuanced discussion about equity that is the aim of each case, the project had to develop guidance for case users and facilitators for engaging and persisting in challenging conversations. Through focus-group testing and the piloting of the cases, the project developed the tools described in section 2.3.

2.2. Development Process

Topics and outlines for five potential video cases were identified based on viewing dozens of hours of classroom video, including more than 50 hours of Statway and Quantway classes. The focal context, Carnegie Math Pathways, provided structure and opportunity for developing equitable instruction. However, review of many hours of classroom video demonstrated that these opportunities may not be accessible to or recognized by instructors. The activities in the video cases, therefore, aim for helping instructors notice and discuss actions that leverage the opportunities while making plans to monitor progress related to key ideas in equitable instruction. The main mechanism for this is decentering, which entails considering interactions from the perspective of another. The student is featured in two cases and the future self in another.

Vignettes were selected and edited following the six principles for vignette development and activity prompts for each section after the guidelines for prompts (see Table 1). While the cases were designed for use by several people in a discussion, the materials might also be useful for individual, self-paced learning (see Section 4 for more on this topic).

Early testing among novice instructors and administrators (the target audiences) determined which three cases to continue developing for cases designed for use by small groups of instructors and administrators, and each case has a brief facilitation guide (1 to 3 pages).

Revisions of video cases and activities were based on feedback from at least two focus groups with each case. All three edited cases were piloted in February through June 2020 (see Section 3 for more on the case content).

The three new case packages were modeled on the successful College Math Video Cases materials (Hauk, Speer, Kung, Tsay, & Hsu, 2013) with one important

adjustment in structure for the equity focus: activities at the end of each case now included a Monitor Progress component. This section offers post-case activities for monitoring progress toward attaining equity goals.

Each case has:

- A context-setting overview
- Clearly articulated, equity-centered professional learning goals
- A case completion timeline
- Between 3 and 7 minutes of a central video vignette and up to 20 minutes of supplementary video to support additional discussion of key ideas
- Well-defined activities for each of the five sections: preview, view, discuss, reflect, and monitor progress/extend learning
- A brief facilitator guide for working through case activities

2.3. Case Tools for Challenging Conversations about Equity

Breaking the silence around inequity calls for

- language that is useful for voicing ideas,
- communication structures that support starting and continuing conversation when the topics are risky (e.g., personally, professionally, socially, emotionally), and
- a means for maintaining awareness about conversational effort.

A tool is a device adapted to facilitate a specific kind of work. This section describes three conversational devices specific to the work of communicating about equity. The first tool is to distinguish between talking about a social structure and engaging in an "-ism." The second tool is a set of agreements for challenging conversations. The third tool is for mindfulness in the midst of conversations.

Noticing the Difference Between -isms and -izations

Being mindful of one's own views includes how to notice and articulate situationally important difference

and similarity. There is a distinction to be made between perpetuating an "ism" and dealing with the fact that it exists. For example, racism refers to the ways in which avoidable and unfair inequalities are perpetuated based on ethnic, cultural, religious, and other characteristics associated with the social concept of "race" at interpersonal, institutional, and societal levels (Berman & Paradies 2010).

By comparison, racialization refers to the processes by which characteristics identified as "racial" become meaningful in different social situations (Delgado & Stefancic 2001; Walton, Priest, & Paradies 2013). The two are often conflated, resulting in the contention that any mention of race is racist. This conflation of terms can derive from a variety of views that include a belief in "color blindness" (Apfelbaum, Norton, & Sommers 2012), a drive to be "colormute" (in which race talk is actively silenced or removed in social interactions or written documents; Pollock 2004), or in taking a stance that society is past race-based discrimination and can be considered "raceless" (Ono 2010)[1]. Racelessness and "colormute" approaches draw on "color blindness" but for different purposes. Paradoxically, to be "colormute" is to assert that racial differences exist in order to actively remove mention of them, while racelessness makes the unwarranted leap of assuming that race no longer matters to anyone (Kempf 2012).

Research has suggested that goals for equity, inclusion, and social justice are undermined when biases remain unexamined, implicit, or "unconscious" (Warikoo, Sinclair, Fei, Jacoby-Senghor 2016). Racialization or genderization or other fill-in-the-blank izations that use language to acknowledge inequities can be a valuable support for making bias explicit rather than implicit.

Discerning differences, recognizing patterns, and anchoring new knowledge in those already-noted differences and patterns are at the core of all human cognition. In other words, examining and making sense of our experiences are the essentials that allow humans to think, know, and learn. This is also true for learning to communicate explicitly about bias and to

challenge it (Singh, 2019). When effective, such explicit communication will generate discomfort, agitation, and conflict as knowledge grows. Persistence for growth requires courage.

Courageous Conversations

During the past 15 years, Singleton and Linton's (2006) courageous conversations framework has become a cornerstone in the professional development of teachers. This is evident by its centrality in defining and reporting, from inclusion in the Oxford Research Encyclopedia of Education (e.g., Beachum, 2020) to use in synthesizing reports of teacher experience (Mawhinney & Rinke, 2019).

The framework is built on four agreements made by participants in a conversation before it starts. These agreements contradict some tightly held cultural norms related to race talk, particularly for people whose experiences have been in the majority culture in the United States. To participate in a "courageous conversation" about any challenging topic, people must agree to:

- stay engaged,
- expect to experience discomfort,
- speak their truth, and
- expect and accept a lack of closure.

Navigating the four agreements requires a great deal of self-awareness, an awareness of others, and a flow of the conversation itself.
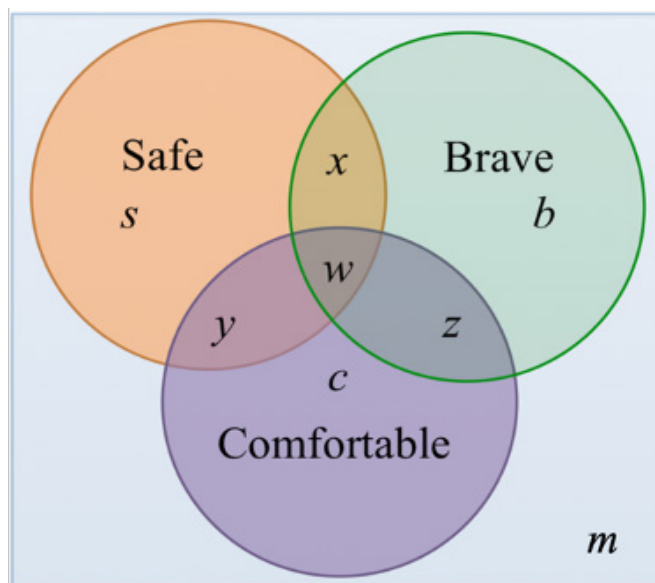
Feeling Safe, Comfortable, and/or Brave

A tool the authors have found helpful in building awareness and responsiveness to the in-the-moment experiences of ourselves and colleagues is the Venn diagram shown in Figure 1 below. The diagram can support self-aware communication about how people experience intellectual and professional risk.

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[1]Rather than discuss the political semantics of using the terms "color blindness" and "colormute," we have left the original authors' uses in quotes.

For example, a person may not feel safe having a conversation with (or about) people from other races but can be brave and handle the discomfort in order to stay engaged in the talk (region b). Section 3, about the cases, contains a few illustrations of experience in regions of Figure 1 (s, b, c, x, y z, w, m). Note that the Venn diagram tool and its use reject the concept of "safe space," which has been in use for many years. The Venn diagram is built on the assumption that interactions or conversations that are "safe" for all participants are rare (if not impossible; Arao & Clemens 2013).

Unlike the term "equity," each of the words in the Venn diagram–safe, comfortable, brave–has a small set of well-established meanings in conversational English (see Figure1 below).

Table 2. Definitions

Comfortable
1. affording or enjoying contentment and security; routine; 2. free from vexation, doubt, or stress
Safe
1. secure; free from risk of harm; 2. unlikely to produce controversy or contradiction; 3. reliable
Brave
1. having or showing courage; 2. mental or moral strength to venture, persevere; withstand danger, fear, or difficulty

U = Personal experience of a conversation

Figure 1. Safe-Comfortable-Brave Venn diagram: a juxtaposition of three types of experiences related to taking interactional risk.

For the purposes of this discussion, the Venn diagram is an individual tool. It is meant as a way for a person to reflect on (and perhaps articulate) the nature of individual experience in a particular moment. As noted, the diagram is not about shared physical or intellectual spaces: a whole conversation, or a classroom or meeting, will not be a part of one of the sets or in a region. In fact, in the course of a 3-minute exchange during a meeting, one person could experience each of the seven regions in the diagram! We have used the diagram in a variety of settings to point to (literally) a discussion tool when having challenging conversations (Hauk, Toney, Brown, & Salguero, 2020).

...racialization refers to the processes by which characteristics identified as "racial" become meaningful in different social situations

Results

The three video cases are summarized in this section. Each case is rooted in the Starting Strong approach in the Carnegie Math Pathways materials. In each case, screenshot(s) from the video highlight the learning goals, driving questions for case participants, main discourse design techniques, and examples from the case of prompts for discussion, reflection, and progress monitoring.

3.1. First Impressions Last

Learning goal: Notice and build awareness of instructional intentions and related learner perceptions on the first day of class. Driving questions are from the student point of view:

- How will my/our thinking be included in classroom activities?
- How will instruction respond to my/our ideas and help people think more deeply?

Design technique: Alternate lenses.

Case participants watch each clip two times. The first time as themselves as a student in the room, and the second time as a different student–one whose background and perspective about the clip have been shared. Participants are asked to notice how the second perspective is valid and warranted by evidence in the video.

Example prompts from *First Impressions Last*

- What does each introduction explicitly tell students about the instructor? What does each implicitly convey? Point to evidence in the video.
- How do different activities signal what the instructor's expectations are?
- What differences do you notice between your answers to these questions after each round of discussion?

3.2. Whose Math Is It?

Learning goal: Notice and build awareness of access and expectations. Driving questions are from the students' point of view:

- How do I/we get to participate in math learning in meaningful ways?
- Can I hide or be ignored? In what ways am I kept engaged?

Design technique: Deconstruct

- Audio only
- Video only
- Combined

Case participants experience two clips each a total of three times; first with captioned audio only (black screen with captions); then with video only (video but no sound or captions); and then combined audio, video, and captions. The goal is to highlight the noticing of verbal cues separate from gestural/physical cues. Such observation supports attention to nuance in how we cue others (students, colleagues) about responsibilities for sense-making and decision-making.

Example Prompts from *Whose Math Is It?*

Preview: Below are the math tasks students in the videos are working on. Read through each to become familiar with the mathematical ideas they contain.

Eric's Class: At summer camp a child comes out every morning to raise a flag. Consider the height of the flag as a function of time. Sketch what the graph of the relationship might look like.

View: For each vignette, the goal is to pay particular attention to how the instructor interacts with students. You need not focus too heavily on the problem, but think about how the instructor addresses the students and how what the instructor says might influence the direction of discussion and nature of the group's work.

• *Audio-Only Discussion:*

1. How many students were in the group? How many contributed to the discussion?
2. What are some things the instructor said to facilitate students' engagement with the math and with their group?
3. Eric asks the group if the graph shown "…is everyone's graph?" Why would he ask this question? How else could Eric have approached the group?
4. In line 8, Eric discovers that one student does not agree with her other group members. Eric says to the group to "convince each other." Why would Eric want the group members to convince each other instead of convincing them himself?

• *Video-Only Discussion:*

As you watch the video without sound, pay attention to the nonverbal cues. In particular, take note of the instructor's visual focus (where is the instructor looking?), the instructor's gestures, and the general position of the people in the discussion. There is also space for your observations about other nonverbal cues.

1. Discuss your observations of the nonverbal
2. actions of each instructor. Explain what the action was and what message the students might have received.
3. Which nonverbal actions of the instructors seemed to invite or exclude members of the group from the discussion? How do you know?

4. What other nonverbal things could the teachers have done to ensure students were all working collaboratively on the mathematical task?

Reflect:

1. Consider all the nonverbal and verbal cues the two instructors used. Which ones do you think were especially effective for promoting discussion in each case? Which will you use the next time you teach and why?
2. In one class, the students were working on the blackboard and in the other class they were seated at a table. What are the instructional advantages of arranging students in each of these ways?
3. Describe how the instructors addressed questions from students in groups. Did some approaches seem especially effective? How do you know?

Monitor Progress and Extend:

Receive and process feedback: Given your answer to the first reflection question, design an "exit" question for students that will monitor the extent to which you achieved your goal (the answer to "Why?"). Gather together and discuss the students' responses with a colleague and notice two things: (1) what students are saying and (2) how the colleague is responding to what students said. Repeat this process with a different colleague.

Extend: You are likely to find your perception of the students' comments evolving as you discuss them with different people. Develop a short email message to students that responds to their exit-ticket observations and communicates something you learned about what they find valuable in supporting their ownership of mathematical ideas.

3.3. Making the Grade

Learning goal: Notice and build awareness of inequities related to assessment, grades, and grading. *Driving questions* are from the instructor-learner point of view:

• What are the purposes of assessments in my instruction? Why were they created this way?
• Why are there grades on the assignments within my/our courses?

Design technique: Make strange

- Identify commonalities and assumptions
- Ask "Why is that a good thing?"

The make-strange technique creates a context in which people must speak about "unspoken" rules. The habitually accepted is carefully examined. In this case, the concepts of "grades" and "fairness" in education are discussed.

Example Prompts from *Making the Grade*

Preview: If two people get the same grade in a class, what does that mean is the same about them?

View: Watch the 7-minute courageous conversation among 10 instructors about grades.

Discuss:

1. Nathan says, "I have 3% built into my syllabus for anybody who's there every day. … It's built into the syllabus in a way that everybody knows it from the first day of class." He is arguing for treating all students equally but in what ways might his policy be unfair?
2. Should a student who tries harder to learn the material get a higher grade than someone who does not try as hard? Why or why not?

Reflect: One goal of assessment is to learn about what students know and can communicate in/with/through mathematics. How do your assessment practices support both the growth of mathematical knowledge and communication about that knowledge?

Monitor Progress and Extend:

Equity audit
- Examine assignments from the past month and planned for next week.
  - o What do students report are the purpose and significance of related grades (e.g., through a one-item open-ended poll)?
  - o What are three possible responses from you? What additional messages does each response send? Select one and revise and use it.
- Repeat.

Example of a Venn diagram-based response:

Now I know what region m is [in the Safe-Comfortable-Brave Venn diagram]. When I reflect on what I just heard all those people say [about grades] and on my own past actions, I am uncomfortable, feeling risk, and not feeling brave. It was hard to decenter, listen to their truths, and recognize my urge to be me-centered, to judge and pigeonhole it away from me. I am thinking hard now about how grades and grading are part of the classroom community structure.

Conclusions

4.1. Significant Accomplishments

The three successes that resulted from this Pathways Collaborative Equity Partners-funded project were significant accomplishments. In particular, the extended timeline of the support allowed the project to be responsive to the sudden pivot to remote and largely online instruction during the COVID- 19 pandemic.

Success 1. Three new video case packages developed for dissemination in the fall of 2020 through the College Math Video Cases website.

Success 2. We leveraged the change in how the case materials were piloted online and the shift in faculty and leader professional learning needs to develop and do field testing (in summer 2020) for an asynchronous version of the Making the Grade case. The revised case, which included a segment on ways to implement inclusive, activity-based assessment in online settings, was timely and effective according to field-test participants in two national college mathematics teaching workshops (totaling more than 100 novice and experienced instructors and department leaders).

Success 3. The demands of online instructional environments brought to the foreground the importance of preparing leaders, instructors, and students to communicate using online tools (e.g., Zoom breakout rooms, online chat, online whiteboards, online documentation in a carefully designed collaborative spreadsheet) in/with/and through mathematics. The piloting of materials in 2020 has made clear that the cases can be completed productively live and online and, in the case of Making the Grade, an asynchronous version of the case is useful.

4.2. Implications

While the proposed case resources are explicitly designed within the context of the Carnegie Math Pathways, they address central issues of instruction, institutional structure, and organization that are applicable broadly in Guided Pathways reform. We anticipate that, like the college mathematics instructional case materials, the new equity-focused video case packages will be valuable to many additional audiences, including institutions that are seeking to make the changes fostered by Guided Pathways in multiple disciplines.

It is already the case that the asynchronous Making the Grade case package was shared by summer field testers with their colleagues in other departments.

The July 22, 2020, Pathways Collaborative Partner webinar about the project was disseminated on the Pathways Collaborative website. In addition to developing the cases described above, this project is shaping the creation of a template for the sustained refreshing and new development of additional cases. The cases will be included in the freely available online resource Video Cases for College Mathematics Instructional Development (Hauk et al., 2013), which is part of the foundational index being developed at the Mathematical Association of America's online resource site, which is named College Mathematics Instructor Development Source (CoMInDs).

4.3. Recommendations for Next Steps

Feedback from instructional leaders during pilot and field testing (e.g., department chairs, providers of professional development for faculty) suggested two important directions for new work:

(1) create video cases focused on building skills among providers of faculty professional development for orchestrating the kinds of conversations that are promoted by the new equity cases (i.e., above and beyond the short facilitation guide) and

(2) develop specifically asynchronous or specifically online versions of cases (like the experiment done with the alternate version of the Making the Grade package).

We have already begun some work along the lines of this second area with the creation and piloting of an alternate, all-online, and partially asynchronous version of First Impressions Last in August 2020. The majority of the 30 novice instructors and 15 instructional leaders who participated subsequently reported successfully trying out in their own teaching some of the ideas and online facilitation techniques they experienced in participating in the case.

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