Community College Instructors' Perceptions of Success in Mathematics

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According to the 2012 Report to the President on Science, Technology, Engineering and Mathematics (STEM) retention, only 40% of STEM majors complete their undergraduate degrees in STEM (PCAST, 2012). This report cites two major reasons for those who leave STEM majors: uninspiring introductory courses and difficulty with the mathematics courses required. More than half of STEM baccalaureate degree earners from 2010 to 2017 reported having done some community college coursework (National Science Foundation, 2019). Indeed, enrollment in community colleges, especially by underrepresented students, has been increasing. In 2017, 43% of Hispanic/Latina/o and African American undergraduate students were enrolled in a community college (U.S. Department of Education, 2018). Improving mathematics ability and confidence may increase the number of students who transfer from a community college to a four-year institution and persist in a STEM major (Acee et al., 2017; Kosovich et al., 2019). Underrepresented minority and first-generation students are overrepresented in the group whose placement tests require them to enroll in algebra before undertaking calculus in college and are at the highest risk of not succeeding in college (Epper & Baker, 2009). In addition to academic factors, such as success in algebra, nonacademic factors (motivation, attitudes, expectations) have been shown to be important to student success (Acee et al., 2017; Kosovich et al., 2019).[1]

The National Educational Longitudinal Study found that only 30% of students taking developmental mathematics courses passed all of the courses in which they were enrolled (Attewell et al., 2006). However, students who passed all of their developmental mathematics course requirements were as successful in subsequent mathematics courses as those who entered community college requiring fewer or no developmental mathematics courses (Bahr, 2008). Implementing interventions that support student success in developmental mathematics are necessary to improve this trajectory.

Koedinger and Sueker (1996) found that community college students vary widely in their age and prior mathematical preparation, are likely to have a history of failing mathematics, have a fragmented understanding of mathematical concepts, lack an appreciation of the importance of mathematics in their lives, show low levels of motivation in mathematics, and have not developed mathematics study skills that predict success (see also Cafarella, 2016). In addition to these challenges, there are competing demands on their time, as they juggle working a full-time job to pay for college and living expenses and often have families for whom they are responsible (Acee et al., 2017; Clement, 2016; Porter & Umbach, 2019). Thus, to support community college students' success in their mathematics courses, it is essential to consider both cognitive factors (e.g., mathematical procedural and conceptual knowledge, study strategies; Hurrell, 2021; Quarles & Davis, 2017; Stigler et al., 2010), as well as social-affective factors (e.g., mathematics anxiety, sense of social belonging, motivation, self-efficacy; Carales & Hooker, 2019; Hulleman & Barron, 2015; Samuel & Warner, 2021; Zientek et al., 2013). To design effective professional development, it would be useful to know what community college instructors already believe about the influence of various cognitive and social-affective factors on student learning. Accordingly, the present study surveyed community college mathematics instructors to understand what they believe about various factors that influence their students' success.

This study of community college instructors was based on the goal theory model of achievement (Dweck & Leggett, 1988; Meece et al., 1988). Developed in the domain of sports performance, the theory has been applied to other learning environments, such as mathematics. The theory's premise is that students' achievement goals are comprised of two components, a mastery goal orientation and a performance

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goal orientation (Ames, 1992). The mastery goal orientation reflects the determination to develop a deeper understanding of the material to be learned and leads to increased self-efficacy, resulting in a greater personal perception of competence. Mastery orientation involves accepting that learning occurs over time and is an important endeavor in and of itself (Midgley et al., 2000); it is about individual improvement and a growth mindset, the belief that abilities can be developed through dedication and hard work.

In contrast, performance goal orientation is related to how well a student can complete a task or assessment, where the comparison is to others completing the same task (Muis et al, 2009). Studies have shown that students can detect whether an instructor's classroom is dominated by mastery or performance goals (Urdan & Schoenfelder, 2006). Performance goals (e.g., answering problems correctly, understanding content the first time) tend to reduce student self-efficacy, whereas mastery goals (e.g., learning different ways to solve problems, learning from mistakes) tend to promote student self-efficacy. In fact, mastery goals are positively associated with a number of desirable attributes of a learner, including self-regulation, increased interest, increased help-seeking behaviors, and even persistence and transfer (Ciani, et al., 2010; Muis, 2004; Muis et al., 2009). Individuals with a performance orientation are less able to react positively to failure or struggle and are not likely to pursue challenging tasks (Ciani et al., 2010), counter to the idea of "productive struggle" when mastering mathematics (Schoenfeld, 2020).

Social agents, such as mathematics instructors, create a mastery climate by emphasizing person-centered improvement, individual effort, and cooperative learning (Selfriz et al., 1992). The motivational climate needed for students to achieve mastery involves establishing norms and values, evaluative standards, and interpersonal interactions that lead to a mastery-oriented learning environment in the classroom (Smith et al., 2008). Students are more likely to learn and have success in an environment that optimizes their personal strengths. Therefore, it is likely important for instructors to attend to their students' goals, motivations, and beliefs about mathematics to help their students develop and strengthen adaptive mindsets.

Students may have more adaptive mastery orientations than instructors believe. In a study of 15 instructors and 15 students of each instructor, instructors rated students' mastery orientation, self-efficacy, and mathematics identity lower than their students rated themselves. Instructors also underestimated their students' desire to understand mathematics and their students' ability to handle challenging problems (Mesa, 2012). Instructors' misperceptions of students' orientation towards mathematics suggests that instructors may not teach and communicate in ways that promote a mastery goal orientation as much as they could. Similarly, a qualitative study of community college students who had succeeded in transferring to a four-year institution found a discrepancy between what faculty reported as being important to student success (e.g., attending office hours, tutoring) and what students reported as resulting in their success (e.g., clear goals, strong motivation, self-empowerment, managing competing demands; Martin et al., 2014).

There are few reports examining the various components of the goal theory model of achievement in community college mathematics classrooms and even fewer that have focused on the instructors' perceptions of their students. Much of this work was formulated in K–12 settings and only recently applied to adult learners, typically in traditional four-year universities. In this study of 68 community college mathematics instructors, we were interested in what instructors perceived as factors that promote student success in learning mathematics based on the mastery orientation aspects of goal theory. We assessed the importance of factors related to a mastery goal orientation, such as students' motivation to learn, efforts to learn mathematics, persistence, willingness to ask for help, and study habits. We included external factors, such as time to study and a positive home environment, because these were instructors working in a community college, and many of their students were likely struggling with constraints on their time (Clement, 2016). We queried instructors about what they felt were the most important barriers to student success, such as hard work, mathematical knowledge, mathematics ability, effective study strategies, and personal conflicts. Lastly, we asked them what advice or counseling they provide to struggling students. If a mastery orientation was the dominant form of goal achievement, we expected instructors to emphasize effective study strategies and student effort and hard work as being important to student success. By such a mastery orientation, instructors would recognize that barriers to success were external challenges unrelated to a student's mathematics ability.

Methods

Participants

We recruited community college instructors by searching faculty pages and mathematics course schedules for all community colleges in two western states. After creating a list of names of potential mathematics instructors at 14 different colleges, a search was conducted for public email addresses. When email addresses were not available, they were created based on the format of the community college email system. An email containing a link to a Qualtrics survey was sent to each instructor asking for assistance with our study related to how students typically study mathematics and how instructors optimize student learning. Approximately 20% of the 370 survey requests were returned as undeliverable. Of the approximately 300 instructors reached, another 10% were not teaching mathematics. Data collection occurred between June and November of 2017 with two follow-up emails sent out over a three-month period. We estimate our response rate to be approximately 25% based on reaching approximately 270 mathematics instructors and having received 70 responses to the survey request, but with varying numbers of complete responses. Our response rate is somewhat higher than previous studies of part-time community college instructors, which ranged from about 12% to 21% (Jacoby, 2001; Kramer et al., 2014). This project was deemed to be exempt from human subjects research under 45 CFR 46.101(b) by the Research Integrity and Compliance Review Office at Colorado State University.

Measures

Demographics and Teaching Experience

Instructor demographic information requested included gender, race/ethnicity, and education. We asked instructors to describe their academic position, how many years they had been teaching, and what classes they taught. We asked, "Do you have any formal teacher training?" to measure knowledge of instructional practices, with response categories yes or no. We further asked, "Does your department have an instructional coach or someone who regularly works with instructors on improving teaching?" to understand whether their institution provided access to professional development aimed at improving teaching quality, with yes or no response options. For purposes of analyses, we collapsed the categories into two position types, a permanent faculty position (faculty or assistant/associate/full professor) and a temporary teaching position (adjunct faculty, graduate research/teaching associate (GTA)).

Student success factors

As a measure of perceived student effort, we asked instructors the stem questions "How do you think most of your students choose to study?" and "How do you think most of your students should study?" with five response options (Table 1).

We asked instructors about 11 factors that could influence a student's success in mathematics using the stem question "How important are each of the following for students to succeed in your course?". The question was asked with responses *not at all important, slightly important, moderately important, very important* and *extremely important* (Table 2). Due to small numbers in the extreme categories, these questions were collapsed into *not at all or slightly important, moderately important,* and *very or extremely important.* Instructors were also given an open-ended question, where they could provide their own ideas of what is important to student success in mathematics.

We asked instructors about what caused students to earn a low grade in their classes with the question "The students' low grades were a combination of what percent of each of the following factors?" The options were: (a) lack of hard work, (b) lack of prior knowledge, (c) lack of mathematics ability, (d) lack of effective study strategies, and (e) conflicts due to work and family responsibilities. We also gave them the opportunity to suggest their own reasons for lack of student success.

To assess how much of a difference instructors felt it would make on final exam grades if instructors and students implemented effective strategies, we asked two questions: first, "How much could the class average on the final exam increase if you were able to implement all of the effective teaching strategies you know?" and second, "How much could the class average on the final exam increase if you did not change how you teach, but your students did all of the work you assigned and implemented all of the study strategies you suggested?". Instructors were asked to respond with a percentage of expected change.

Lastly, we asked instructors what advice they gave to struggling students and provided them with six options and space to provide their own responses (Table 3). The stem question was "How likely would you be to do each of the following for these struggling students?". The responses categories were *extremely unlikely, somewhat unlikely, neither likely nor unlikely, somewhat likely* and *extremely likely*, which were recoded by collapsing the five categories into *extremely/somewhat unlikely, neither likely nor unlikely,* or *somewhat/extremely likely*.

Analysis

Frequencies were used to describe the categorical variables asking how students study and how they should study and the importance of selected factors for student success. The exact Jonckheere–Terpstra (JT) test for ordered differences with a Bonferroni-adjusted p-value (.05/11 = .0045) was used to assess differences between faculty status, teacher training and access to an instructional coach, and each of the 11 success factors. Means and 95% confidence intervals were graphed to show the mean percentages for reasons for students' low grades in mathematics, as reported by instructors. Spearman's rho (ρ) for nonnormally distributed continuous data were used to assess whether continuous measures were correlated. A paired t-test was used to assess whether statistical differences existed between instructors' perceptions of improving final exam scores using effective teaching strategies and students' use of effective study strategies.

Results

Demographics and Teaching Experience

A total of 70 respondents completed or at least partially completed the survey. The respondents were evenly split between males ($n = 34$) and females ($n = 34$), with two not reporting gender. Most of the 70 who responded to the race/ethnicity question were White (84.3%). Four instructors self-reported as Hispanic/Latina/o. A master's degree was the most frequently reported level of education ($n = 48$, 68.6%), followed by a doctorate degree ($n = 15$, 21.4%), and a few had bachelor's degrees ($n = 7$, 10.0%). The majority of respondents ($n = 37$, 52.9%) were in permanent teaching positions (faculty, assistant professor, associate professor, professor); fewer, but a sizeable proportion, were in GTA-type positions ($n = 33$, 47.1%). The number of years instructors had been teaching mathematics varied widely (range = 1 to 45 years, M = 14.5, SD = 10.4). About 66% ($n = 46$) of the respondents reported having had formal teacher training, but only 33% ($n = 23$) reported having access to an instructional coach to improve their teaching skills. Three quarters of the respondents taught introductory, intermediate, or college algebra; the remaining instructors taught a variety of classes, from consumer mathematics to differential equations.

Student Success Factors

Instructors reported overwhelmingly (90%) that their students studied based on what was due or overdue; however, 81% felt that students should study what they understood least and that they should plan their study and adhere to a study schedule (Table 1).

Student work habits, motivation to do well, willingness to ask for help, persistence when problems become difficult, and having adequate study time were judged the most important factors for students' success (Table 2). Over 80% of instructors said that each of these factors were very or extremely important for student success. Interestingly, only 55 instructors answered the question about having sufficient free time to study. Although 68% of mathematics instructors reported that basic mathematics ability was very or extremely important, only 36% reported that mathematics skills at the start of the year was very or extremely important. Written responses from instructors included not procrastinating, regularly attending class, having a positive mathematics attitude, believing they can learn mathematics, critical thinking skills, and having a growth mindset versus a performance mindset. No statistically significant differences were observed in ordered differences for any of the instructor characteristics; however, working well with others was a more important factor to those who had access to an instructional coach compared to those who did not ($p = .006$).

A lack of hard work showed the highest contribution to receiving a low grade in mathematics in the instructors' assessment of reasons students struggle (Figure 1), followed by lack of mathematics ability, and lack of effective study strategies. Very few instructors gave much weight to the lack of prior knowledge or conflicts with work and family responsibilities as a cause of students achieving a low grade. Qualitative responses by six instructors to the reasons for a poor grade were students' failure to seek help, their inability to think critically, and a lack of confidence in their mathematics ability.

Compared to permanent or fulltime faculty members, instructors in adjunct or GTA positions attributed greater weight to a lack of hard work causing a low grade (GTA: M = 42.7, SD = 27.7; faculty: M = 27.8, SD = 15.4; $p = .03$), gave lower weight to prior knowledge causing a low grade (GTA: M = 5.06, SD = 6.78; faculty: M = 12.3, SD = 9.58; $p = .002$), and were less likely to attribute a low grade to lack

Table 1
Instructor Perceptions of Students' Studying Habits, n = 70

Approach to Studying for Course	How Students Study *n* (%)	How Instructors Believe that Students Should Study *n* (%)
Whatever is due soonest/overdue	63 (90.0)	6 (8.57)
Whatever they have not studied for the longest time	1 (1.43)	4 (5.71)
Whatever they find interesting	2 (2.86)	3 (4.29)
Whatever topic they feel they understand least	2 (2.86)	31 (44.3)
They plan their study schedule ahead of time, and they study whatever they have scheduled	2 (2.86)	26 (37.1)

Table 2
Instructor Perceptions of Factors Important for Student Success

Success Factor	*n*	Not at all/slightly important *n* (%)	Moderately important *n* (%)	Very/extremely important *n* (%)
Proficiency in English	70	14 (20.0)	34 (48.6)	22 (31.4)
Basic mathematics ability	69	7 (10.1)	15 (21.7)	47 (68.1)
Mathematics skills at the start of the year	69	13 (18.8)	31 (44.9)	25 (36.2)
Ability to work well with others	69	24 (34.8)	30 (43.5)	15 (21.7)
Willingness to ask for help	69	1 (1.45)	12 (17.4)	56 (81.2)
Supportive home environments	66	12 (18.2)	26 (39.4)	28 (42.4)
Free time to study after fulfilling nonschool responsibilities	55	4 (7.27)	6 (10.9)	45 (81.8)
Work habits (completing tasks, paying attention, effort)	69	3 (4.35)	8 (11.6)	58 (84.1)
Motivation to do well	69	2 (2.90)	10 (14.5)	57 (82.6)
Persistence when problems become difficult	70	2 (2.86)	5 (7.14)	63 (90.0)
Self-confidence	69	6 (8.70)	20 (29.0)	43 (62.3)

of mathematics ability (GTA: M = 15.5, SD = 12.8; faculty: M = 33.7, SD = 21.4; $p = .0002$). Teacher training and access to an instructional coach showed no differences on any of the contributing factors to a student's low grade.

The responses showed consistency and provided evidence for internal validity. Lack of hard work as a reason for a poor grade was negatively correlated with a lack of mathematics ability (Spearman's $\rho = -.29$, $p = .02$), indicating that instructors who felt students were not working hard enough at mathematics also felt that the problem was not a lack of mathematics ability. These instructors seem to believe that the limiting factor was hard work and not innate mathematical talent. Furthermore, lack of prior knowledge was positively correlated with lack of mathematics ability (Spearman's $\rho = .33$, $p = .008$), indicating that instructors see a lack of prior knowledge as related to a lack of mathematics ability.

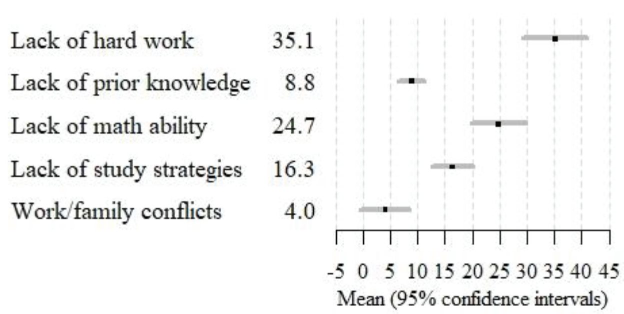


Figure 1. Means with 95% confidence intervals for instructors' perceptions of reasons students earn a low grade in community college mathematics.

Instructors' views of how much the class average on the final exam would increase with their use of effective teaching strategies versus students' use of effective study strategies were significantly correlated (teaching strategies M = 29.7, SD = 26.4; study strategies M = 33.1, SD = 24.7, Spearman's $\rho = .73$, $p < .0001$). The mean difference between these measures (M = 4.01, SD = 12.1) was statistically significant in a paired *t*-test ($t = 2.63$, $p = .01$). Instructors hypothesized greater increases in the final exam score if students used all of the effective strategies they were taught rather than if instructors used all of the effective teaching strategies they knew. The increase in final exam scores by instructors using effective teaching strategies was positively correlated with the degree to which instructors attributed students' low mathematics grades to a lack of prior knowledge (Spearman's $\rho = .34$, $p = .007$) and lack of mathematics ability (Spearman's $\rho = .40$, $p = .001$). Similarly, the increase in final exam scores by students using effective study strategies was also positively correlated with the degree to which instructors attributed students' low mathematics grades to a lack of prior knowledge (Spearman's $\rho = .31$, $p = .01$) and a lack of mathematics ability (Spearman's $\rho = .40$, $p = .001$). Additionally, compared to permanent or fulltime faculty members, GTAs were nearly half as likely to endorse the use of better teaching strategies to improve final exam scores (GTA: M = 18.4, SD = 16.9; faculty: M = 39.6, SD = 29.8, $p = .004$).

Lastly, we asked instructors how they counseled their students who were struggling in the mathematics course (Table 3). Most instructors (90%) responded that they were likely to offer students suggestions on how to study effectively. About 16% to 20% advised students that maybe they should consider a different career that did not involve understanding mathematics, but few suggested that not everyone can do mathematics (3.3%).

Discussion

The present study asked what community college mathematics instructors believe about the factors that influence their students' success. We were interested in the degree to which instructors endorsed beliefs that were consistent with a mastery orientation to mathematics rather than a performance orientation. A fraction of instructors reported characteristics that may not support a mastery orientation in the classroom. For example, 15–20% of instructors indicated that they would tell a struggling student to consider dropping the course, explain that not everyone is meant to pursue a career in mathematics, and console the student by explaining that people who struggle in mathematics can go on to succeed in other careers (Table 3). Although these hypothetical responses are seemingly kind and comforting, research has demonstrated that they actually demotivate students and make students feel as though their teacher has low expectations (Rattan et al., 2012). Similarly, on average, instructors attributed about 25% of a hypothetical student's poor exam grade to a lack of mathematics ability. Viewing mathematics as an ability one can lack is consistent with a maladaptive performance orientation or fixed mindset, and research has revealed that STEM instructors with more fixed mindsets have students who learn less, are more likely to drop the course, and are more likely to feel like they do not belong in the course; this effect is amplified for underrepresented students (Canning et al., 2019; Muenks et al., 2020).

In contrast to a performance orientation and associated fixed mindset, which prioritizes abilities and outcomes, a goal orientation and associated growth mindset prioritizes effort and learning. A moderate proportion of the instructors surveyed in this present study endorsed beliefs that were more consistent with a performance orientation than a mastery orientation. The instructors attributed about 35% of a student's low grade to lack of hard work. Interestingly, GTAs were more likely to think that hard work was the limiting factor and less likely to think mathematics ability was a constraint on student success, suggesting that GTAs may have more of a mastery orientation towards teaching and learning mathematics. Future research should examine how teachers' performance versus mastery orientations change over the course of the careers and which teaching experiences contribute to changes in such orientations.

Finally, consistent with the theory that a prioritization on ability versus effort are opposing mindsets, there was evidence in our data that these perspectives were negatively correlated. Instructors who attributed more of a student's low grade to a lack of hard work tended to attribute less of a student's low grade to a lack of ability.

Although having a mindset that prioritizes effort over ability is important for learning (Yeager et al., 2019), learning

Table 3

Community College Instructor Responses to Struggling Students

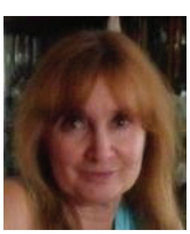
Instructor Advice	*n*	Unlikely Response *n* (%)	Neither Likely nor Unlikely *n* (%)	Likely Response *n* (%)
Explain that not everyone has mathematics talent—some people are 'mathematics people' and some people are not.	64	58 (90.6)	4 (6.25)	2 (3.13)
Console the student for the grade by telling them plenty of people have trouble in mathematics but go on to be very successful in other fields.	64	38 (59.4)	12 (18.8)	14 (21.9)
Explain that not everyone is meant to pursue a career in mathematics.	62	45 (72.6)	7 (11.3)	10 (16.1)
Assign less mathematics homework.	62	60 (96.8)	2 (3.23)	0 (0.0)
Talk to the student about dropping the class.	62	28 (45.2)	23 (37.1)	11 (17.7)
Offer suggestions for how to study more effectively.	60	3 (5.00)	1 (1.67)	56 (93.3)

is not determined solely by how much time or effort one puts into studying. In other words, how one studies is a stronger predictor of learning than how much one studies (Rhodes et al., 2020). A key determinant of learning is the quality of strategies used in the time spent studying. The instructors surveyed in this study did not necessarily appreciate this nuance. Although more than 90% of instructors indicated that that they were likely or very likely to give a struggling student tips on how to study more effectively, these instructors seemed to prioritize amount of effort over quality of effort. Instructors attributed nearly twice as much of students' low grades to a lack of hard work as a lack of effective study strategies (35.1% vs. 16.3%). Future research should investigate what teachers believe about quantity versus quality of studying, how their beliefs affect their pedagogy and advice they give to their students, and how student outcomes are affected in turn. Indeed, instructors' positions predict student success. Permanent mathematics faculty, in contrast to temporary instructors, showed a positive effect on students learning developmental mathematics, that further influenced their success in college algebra (Penny & White, 1998). It might be that permanent faculty are more invested in improving their teaching strategies and supporting student study efforts.

Another area in which instructors' beliefs did not align with research evidence was external influences on student learning. Forty-four of 51 instructors (86.3%) reported that students' low grades could not be attributed to conflicts due to work and family responsibilities. This directly contradicts what is known about community college students' struggles with competing demands on their time (Acee et al., 2017; Clement, 2016). For instance, in a recent study of 110 diverse community college students, only 25% reported being able to spend the amount of time studying for their class as their instructor expected them to (Clement, 2016). In this group of students, 34.7% reported that family obligations took up their time, and 36.1% said that their jobs took up their time. Interestingly, 80% of surveyed instructors also indicated that free time to study was very important or extremely important for student success. It is unclear why the surveyed instructors both indicated that free time is important but did not think that work and family responsibilities contributed to low grades. Future research should examine how community college mathematics instructors think about their students' work and family responsibilities and how instructors can endorse seemingly contradictory views.

We note several limitations of the present study. For example, we found it challenging to obtain the sample size we desired for this study, because community college instructors lack time to respond, and about half are not in permanent positions. Finding adjunct and part-time instructors required searching mathematics course listings in college catalogs. These efforts to engage adjunct instructors seem to have succeeded, since nearly half the sample was comprised of instructors who were not in permanent positions. However, it is a self-selected sample, and we cannot know how representative it is of the entire community college mathematics instructor population. Additionally, we cannot know how well self-report matches behaviors in the class, nor can we capture the dominant learning climate without direct observation. We were not able to obtain student views of these instructors, since we surveyed across 14 different community colleges, but a study directly comparing instructor views of their classroom orientation to their student's perceptions would be useful as a next step in this area of research.

Taken together, the results of the present study in combination with prior research, suggest that community college students have extremely limited study time due to family and work obligations, yet instructors may underappreciate the degree to which these external commitments affect how much students can study. Therefore, it may be useful for professional development to help community college instructors shift their emphasis on amount of studying or effort to a focus on quality of studying. This approach would likely have traction among community college instructors, as most instructors surveyed in this study indicated that they were likely to give study tips to a struggling student. The instructors surveyed in this study also reported some strong ideas about how to help students study more effectively. A proactive, early intervention to teach effective study skills could serve to help students make more efficient use of limited time. Approaches such as the Learning and Study Strategies Inventory (LASSI) have been shown to be effective when incorporated early into the mathematics classroom (Mireles et al., 2011). Doing more to teach learning strategies would likely move the classroom towards a mastery orientation, build student confidence, improve self-efficacy and persistence, and lead to higher learning and achievement.



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with community colleges to implement programs that increase transfer from community colleges to four-year institutions and, with the support of the NSF, the CO-WY AMP has assisted students in finding research experience early in their college careers, both domestically and internationally.

Hannah Hausman, PhD, is an assistant professor of psychology at the University of California, Santa Cruz. Hannah's research as a cognitive psychologist broadly asks: How do people learn best, how do they think they learn best, and why do the two often not align? In addition to conducting basic and applied research at the intersection of cognitive psychology and education, Hannah has supported several educational organizations in radically transforming students' educational experiences, including Denver Public Schools and the High Meadows Graduate School of Teaching and Learning. More recently, she contributed to initiatives within the Colorado-Wyoming Alliance of the Louis Stokes Alliances for Minority Participation program, funded by the National Science Foundation (NSF). In service of the project's aim to help underrepresented students succeed in STEM, her work has focused on promoting evidence-based learning strategies in community college mathematics classrooms.

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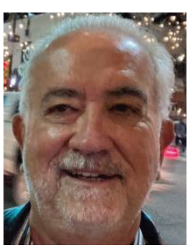

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