

Exploring Urban Secondary STEM Teacher Candidates' Perceptions of the Impact of a Culturally Responsive Classroom Management Course

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ABSTRACT

The research goal was to examine the impact of a culturally responsive classroom management (CRCM) course taken concurrently with clinical teaching on the development of secondary STEM teacher candidates' CRCM self-efficacy in a UTeach program. The teacher candidates (n = 16) attended a Tier 1 research university in a diverse urban setting. The Culturally Responsive Classroom Management Self-Efficacy scale was administered as a pre/posttest (Siwatu, 2017), followed by an exit interview. Clinical teachers have demonstrated improved self-efficacy in areas such as developing student-teacher relationships to foster community, establishing co-created norms, and enforcing routines and procedures. The implications highlight the need to integrate CRCM in UTeach and STEM teacher preparation programs to promote inclusive, equitable STEM classrooms.

Keywords:

classroom management, culture, STEM, novice teachers, secondary teachers

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INTRODUCTION

Urban secondary STEM teacher candidates experience unique challenges in terms of classroom management. The lack of training and authentic practice inhibits the preparedness of those entering their teaching careers in urban environments (Bowsher et al., 2018), with poor retention rates of STEM teachers soaring since the COVID-19 pandemic (Lam et al., 2025). Classroom management is vital to the effectiveness of teachers, as teachers play a key role in educating students (Hattie, 2009). Additionally, classroom management has been shown to improve both students' social-emotional development and their academic outcomes (Korpershoek et al., 2016). The lack of training and authentic practice inhibits the preparedness of those entering their teaching career in urban environments (Bowsher et al., 2018). Moreover, when urban novice teachers do not have proper training in classroom management, they often experience a disconnect with student culture, prompting unwanted behaviors (Kwok & Svajda-Hardy, 2021). Sadly, many preservice teachers leave their preparation programs and teach in environments other than urban environments, often due to the unique challenges for which many feel unprepared (Camacho et al., 2021; Kneebone & Holmes, 2016).

Training of urban STEM teacher candidates in secondary schools requires attention. While our UTeach program integrates training in culturally responsive practice (CRP) from the first course, questions exist regarding the extent to which social justice and CRP are integrated into preservice programmatic coursework (Sanders, et al., 2024; Tudella, et al., 2020). Given that behavior is culturally influenced (Weinstein et al., 2004), we see the need to develop a culturally responsive classroom management (CRCM) course. The literature indicates that teacher candidates receive little to no training in CRCM (Milner, 2019; Siwatu et al., 2017), as evidenced by the paucity of research on this topic. Additionally, evidence indicates that preservice teachers are still in the development stage of how student diversity impacts classroom management and their praxis (Kwok et al., 2020). However, some recent research has drawn attention to the lack of CRCM policy (Williams et al., 2023) as well as some exploratory work on teachers' CRCM self-efficacy beliefs after exposure to CRCM professional development (Grice, et al., 2022). CRCM specifically views classroom management and behavior through the lens of culture (Weinstein et al., 2004). This phenomenon is especially true for teacher candidates since they are often not required to take classroom management as part of their preparation program (Pomerance & Walsh, 2020). However, with CRCM training, teacher candidates' classroom management self-efficacy has been shown to improve (Siwatu et al., 2017; Thomas et al., 2020). Since retaining urban

teachers has been a struggle ((Lam et al., 2025; Papay et al., 2017) and considering the demographic differences between students and teachers (NCES, 2022), we embarked on providing training in CRCM to our teacher candidates, who complete their clinical teaching in urban schools. By offering this elective course, our hope is to better prepare our teacher candidates while also improving the current retention trends.

Program Context and Birth of a CRCM Course

Our secondary STEM teacher preparation program is housed at a Tier 1 urban research university and is the first replication site of the UTeach program. The program began in 2007 and has prepared approximately 600 secondary STEM teachers. Our program offers two pathways for certification following the UTeach program model: a minor in education for secondary STEM undergraduates and an alternative certification program (ACP) offered to career changers starting in 2019.

Over the course of the program, the faculty realized the need to address issues that were causing STEM teachers to leave the field after only a few years. Classroom management was a key point of concern with the dire need for inclusion in our program. A team member proposed developing a CRCM course that was based on culturally responsive pedagogical practices and community-building in the classroom to address the concerns we were seeing with cultural gaps between the teacher candidates and the students. While the course was not initially based upon Weinstein et al's., (2004) framework, the course mirrors the tenets of the CRCM discussed in the theoretical framework section of this paper.

The birth of the CRCM elective course began in Spring 2021, with a focus on infusing a culturally responsive pedagogy (CRP), developing a teacher presence as a warm demander, providing secondary students with voice through co-created community norms, addressing nonproductive behaviors in a culturally responsive way, establishing relationships and community-building that holds all members accountable in the classroom, to name a few. The course differs from traditional classroom management courses in that it does not simply teach general strategies, and avoids providing a “bag of tricks” to students (Voss et al., 2020); it intentionally infuses the impact of both student and teacher culture and how they view behavior, brain development, communication, authority, learning, etc. The course has shown promise in preparing teacher candidates for the culturally rich classrooms in which they will teach.

The CRCM course is an elective for traditional undergraduate students and is typically taken during the student teaching semester. The 9-month ACP program, which began in 2019, was a required course for the ACP teacher candidates. The reason for this was based on the intensity of the program over such a short period of time. ACP teacher candidates

are not afforded a slower progression of entry into the classroom, which is typical of the undergraduate program, where field-based experience begins in the introductory course.

The purpose of this paper is to examine the impact of offering a CRCM course taken concurrently with clinical teaching on the development of a cohort of secondary STEM teacher candidates. Two key research questions drive this study.

- (1) To what extent did STEM teacher candidates improve their CRCM self-efficacy?
- (2) In what ways did the CRCM course taught in conjunction with clinical teaching improve the development of STEM teacher candidates in CRCM implementation?

LITERATURE REVIEW

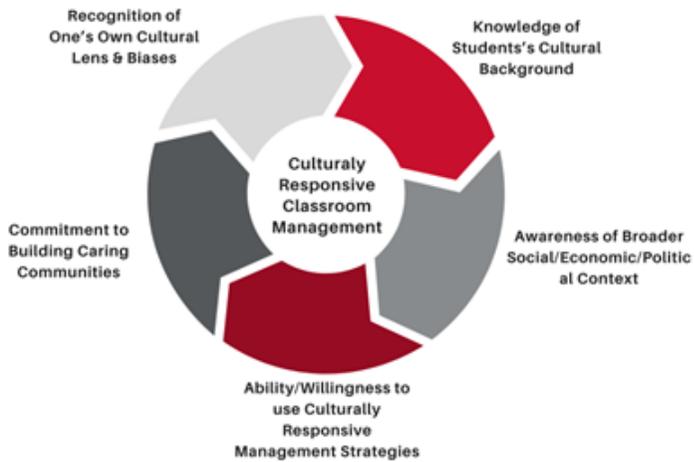
Conceptual Framework

The Culturally Responsive Classroom Management framework (Weinstein et al., 2004) served as the lens for examining the data. Although this framework was established over two decades ago, there is scant evidence of its application to training STEM teachers. CRCM focuses specifically on the interlinking of culture and classroom management. The CRCM framework includes 1) recognition of personal biases and beliefs about behavior, addressing ethnocentric beliefs; 2) acknowledgment that student differences exist; 3) addressing the ways discriminatory practices are expressed within schooling systems; 4) ability and willingness to implement CRCM strategies in the classroom; and 5) commitment to building caring classroom communities (Weinstein et al., 2004) (see Figure 1). This framework has embedded and extended the frameworks established by Ladson-Billings' Culturally Responsive Pedagogy (CRP) (1995) and Gay's Culturally Relevant Teaching (CRT) (2002) by viewing behavior through the lens of culture (Weinstein et al., 2003).

Understanding the relationship between culture and behavior is crucial for effective classroom management. To become culturally responsive, teachers must use "students' culture as a vehicle for learning" (Ladson-Billings, 1995, p. 161) and behaving in the classroom (Weinstein et al., 2003). The two are intertwined. CRCM focuses specifically on the interlinking of culture and classroom management. Teacher candidates must understand culture to recognize student backgrounds, implicit biases, and how to use students' unique cultural capital to build caring learning communities for their students. Integrating CRCM into coursework and field experience is an approach that could yield positive results for teacher candidates in fostering culturally responsive practices.

Figure 1.

Culturally Responsive Classroom Management Framework (Weinstein et al., 2004)



Note. Visually created on the basis of Weinstein et al.'s framework (2004)

Secondary STEM Teacher CRCM Training

Secondary STEM teacher candidates often lack explicit training in classroom management, with nascent evidence of such preparation. More specifically, there is a dearth of research that focuses specifically on research with STEM teachers using CRCM. This begs the question “Are STEM teachers prepared in CRCM?” The gap in CRCM training is a direct result of the lack of requisite coursework and authentic experiences in classroom management for teacher candidates (Pomerance & Walsh, 2020). Tanase et al. (2021) examined math and science teachers for culturally responsive practices (CRPs) and found that some strategies, such as connecting content to students’ interests and real-life experiences and allowing student choice, were being used. However, the study did not clearly address the connection between CRP and classroom management. One study reported that teacher candidates’ challenges in STEM implementation were due to the complex nature of managing labs and projects with large numbers of secondary students (Berisha & Vula, 2021). Training in CRCM concurrently with STEM content preparation has potential benefits because of the inquiry and hands-on nature of STEM teaching.

Culturally responsive classroom management, a conceptual framework developed in 2003 (Weinstein et al., 2023;2024), has been underutilized in the development of teacher-educator coursework, with minimal support in CRCM at the policy level (Williams et al., 2022). As stated, CRCM is grounded in the work of Ladson-Billings' (1995) culturally relevant pedagogy (CRP) and Gay's (2002) culturally responsive teaching (CRT), with a specific focus on classroom management. Teachers must be exposed to the CRP, as it has been found to be a statistically significant predictor of teachers' CRCM self-efficacy (Taylor & Wendt, 2022). The importance of incorporating CRP and CRCM into TPPs is evidenced by the disproportionality of students with color receiving exclusionary discipline practices (Bal et al., 2019; Milner et al., 2019). These disparities are a concern for urban schools, where students of color represent a larger proportion of the student population (Welsh & Swain, 2020). The infusion of CRCM training is a promising method for ensuring that biases are examined and that practices revisited to ensure that *both* students' and teachers' cultures and backgrounds are considered when managing classrooms.

Self-Efficacy and Classroom Management

Self-efficacy was defined by Bandura (1977, 1997) as perceived personal capability. Formally defined, perceived self-efficacy comprises "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1977, p. 2). Self-efficacy perceptions predict the goals individuals set for themselves and the attainment of those goals (Bandura, 1977). When an individual perceives themselves as more efficacious in a particular area, more motivation exists to persist in overcoming potentially aversive experiences.

Scholars have reported that teacher actions and attitudes are directly related to teachers' perceptions of self-efficacy as teachers (Forsbach-Rothman et al., 2007) and, ultimately, as classroom managers (Siwatu, 2017). Teachers often shed insight into their self-efficacy regarding a given task by using statements such as "I can" or "I cannot" (Siwatu, 2017). The idea of efficacy has also been applied to the realm of education and is often used to predict teaching behaviors. This construct is defined as "the extent to which the teacher believes he or she can affect student performance" (Berman et al., 1977, p. 160). Self-efficacy regarding specific skills has been shown to impact teacher behavior, attitudes, and overall quality of work (Forsbach-Rothman et al., 2007). Classroom management self-efficacy (CMSE) has been examined in various studies, including one where a positive relationship between CMSE and student engagement was related to years of teaching

experience (Berger et al., 2018). Additionally, Aloe (2014) identified a moderate effect size between classroom management self-efficacy and teacher burnout, including emotional exhaustion, depersonalization, and a decreased sense of personal accomplishment, with the largest effect between CMSE and personal accomplishment (0.43). The findings concerning CM self-efficacy also revealed a moderate relationship between CMSE and teacher burnout, including mental exhaustion. Additionally, the scholars in this study reported that teacher self-efficacy improved with experience among novice teachers, indicating the importance of authentic practice.

The Culturally Responsive Classroom Management Self-Efficacy Scale (CRCMSE) was developed to identify teachers' efficacy in specific culturally responsive CM practices (Siwatu et al., 2017). The instrument manifests a way to identify teachers' behaviors in connection with their CRCM self-efficacy. The survey development uniquely applies culturally responsive practices to evidence-based classroom behaviors that teachers may encounter in the classroom. The items cover the following practices: (a) developing and maintaining caring relationships with students, (b) understanding the relevance of warm and secure classrooms that respect diverse cultures, (c) knowing how to communicate with families, (d) designing classrooms to increase visual representation of students' culture, (e) establishing high behavioral expectations, (f) teaching classroom rules and procedures, (g) understanding that behaviors represent cultural norms, and (h) assessing which behaviors are not conducive to the classroom. The instrument's initial validation resulted in high overall CRCMSE scores ($M = 80.73$, $SD = 11.53$) (Siwatu et al., 2017). Scholars have found that targeted training and experiences can improve CRCMSE among preservice teachers (Taylor & Wendt, 2022; Watson et al., 2023).

RESEARCH METHOD

We used a qualitative methodology (Patton, 1990; Saldaña, 2017) that incorporated pre/post surveys and end-of-course interviews. Clinical teachers ($n=16$) in a Tier 1 research university in an urban center located in the southern U.S. completed an undergraduate CRCM course concurrently with their clinical teaching field placements during the spring of 2023. The course was in a hybrid format with asynchronous meetings on Tuesday and in-person meetings on Thursdays. The course goals included the study of classroom management theories and theorists, the practical application of research-driven management practices, and how to ensure that management practices are culturally responsive. A key focus of the course emphasized building a community as a foundation for successful management practices, with a focus on relationship building.

The CRCM course varies from traditional classroom management courses in that CRCM is taught explicitly and with the intention of how specific strategies are used to ensure the incorporation of both students’ and teachers’ culture, as opposed to courses that simply teach a list of strategies without addressing cultural influences. For example, typical classroom management courses emphasize the importance of having clear expectations. The CRCM course also emphasizes this but with students as part of that conversation. Teacher candidates learn to create co-created student norms where the class creates a social contract on which all come to an agreement. Even if a set of teacher-created norms are presented to students, they serve as a launch pad for students to discuss, define, and add to the list to ensure that the optimal learning and conditions meet all the students’ needs. Additionally, norms are referenced daily and used as tools for redirection and accountability.

Participants

The STEM teacher candidates in the cohort were primarily males and ethnically diverse (Table 1). All participants were STEM majors who sought certification through one of two pathways: the traditional undergraduate certification route or a university-based alternative certification route. The alternative certification students were required to take the CRCM course, while undergraduates were allowed to take it as an elective.

Table 1
Demographic profile of STEM Teachers Candidates

Gender	Females	4
	Males	12
Content Area	Math	9
	Science	6
	Other Stem Field	1
Certification Pathway	Traditional Undergraduate	8
	Alternative Certification Program	8
Ethnicity	Asian	8
	Black/African American	2
	Hispanic/LatinX	5
	White, Not Hispanic	1

Note. Teacher candidates in the traditional route will be notated as (T); those in the alternative certification route will be notated as (ACP).

All sixteen teacher candidates were enrolled in the CRCM course and were placed with carefully selected mentors for clinical field placement. They received frequent visits from the university faculty with feedback and coaching regarding their CRCM practices.

All clinical teachers in the course were informed of the study and gave voluntary consent to participate. The teacher candidates were asked to complete the CRCM self-efficacy scale survey at the beginning and end of the semester, which included 35 CRCMSE items on a 10-point scale. The survey also included demographic items. All 16 clinical teachers were asked to participate in a semi-structured interview, with eleven of the participants completing a 45–60-minute virtual interview regarding their development in the CRCM as a result of their course and field experience. All transcripts were transcribed, cleaned, and deidentified via Otter.ai. We subsequently coded all the transcripts via the CRCM framework as the lens for interpretation. We conducted additional rounds of coding, reducing the codes via axial coding (Saldaña, 2017), revealing the most salient themes. We agreed on the final themes, which included *CRCM strategy implementation*, with the subthemes of *teacher presence as a warm-demander* and *classroom expectations and co-created norms, the development of student-teacher relationships to create a caring community*, and *classroom management challenges*.

RESULTS

CRCMSE Scale Pre/Post-Survey Results

The results from the CRCMSE survey highlighted areas where teacher candidates felt more efficacious and where they had lower perceptions of self-efficacy regarding their ability to implement CRCM. The survey results indicated that teacher candidates grew in almost all areas to varying degrees across each survey item (Table 2). One exception where no clear growth was found was “*Establish two-way communication with non-English speaking parents.*” The most consistent growth was observed in behavioral areas, including managing “defiant behaviors,” redirecting unproductive behaviors, and using discipline methods that were not exclusionary.

These findings align with the course content, where students learn specific ways to handle tough management issues such as cheating, off-task behaviors, and authoritative presence. Notably, all the clinical teachers grew at relatively similar rates (see Figure 2).

Figure 2
CRCMSE Pre/Post-Test Means

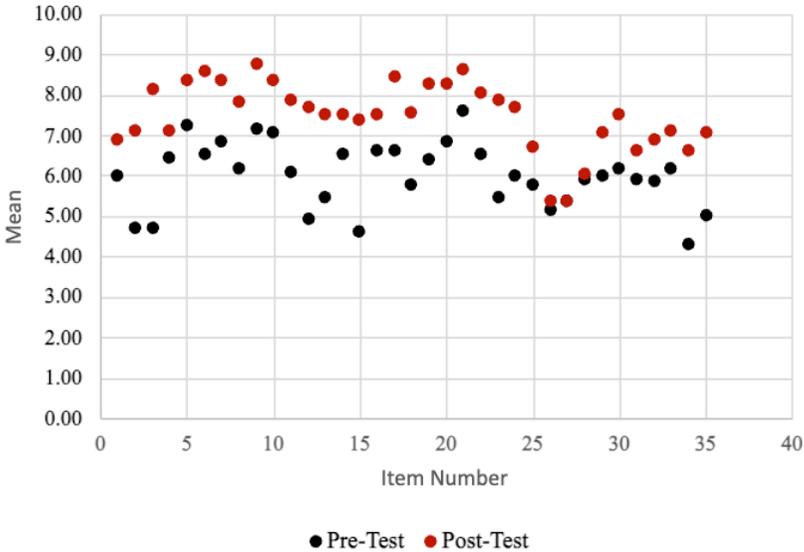


Table 2
Mean Responses of Teacher Candidates CRCMSE Survey

Item	CRCMSE Prompt	Pre-Test Mean	SD	Post-Test Mean	SD	Pre/Post Test Improvement
1	Assess students' behaviors with the knowledge that acceptable school behaviors may not match those that are acceptable within a student's home culture.	6.00	1.47	6.88	1.96	0.88
2	Use culturally responsive discipline practices to alter the behavior of a student who is being defiant.	4.69	1.55	7.13	1.75	2.43
3	<i>Create a learning environment that conveys respect for the cultures of all students in my classroom.</i>	4.69	1.55	8.13	1.78	3.43
4	Use my knowledge of students' cultural backgrounds to create a culturally compatible learning environment.	6.46	1.76	7.13	2.33	0.66

5	Establish high behavioral expectations that encourage students to produce high quality work.	7.23	1.64	8.38	1.45	1.14
6	Clearly communicate classroom policies.	6.54	1.61	8.56	1.03	2.02
7	Structure the learning environment so that all students feel like a valued member of the learning community.	6.85	1.91	8.38	2.00	1.53
8	Use what I know about my students' cultural background to develop an effective learning environment.	6.15	2.30	7.81	1.60	1.66
9	Encourage students to work together on classroom tasks, when appropriate.	7.15	2.23	8.75	1.18	1.60
10	Design the classroom in a way that communicates respect for diversity.	7.08	1.93	8.38	1.02	1.30
11	Use strategies that will hold students accountable for producing high quality work.	6.08	1.89	7.88	1.41	1.80
12	Address inappropriate behavior without relying on traditional methods of discipline such as office referrals.	4.92	1.32	7.69	1.54	2.76
13	Critically analyze student s' classroom behavior fro m a cross-cultural perspective.	5.46	1.81	7.50	1.59	2.04
14	Modify lesson plans so that students remain actively engaged through- out the entire class period or lesson.	6.54	1.39	7.50	1.97	0.96
15	Redirect students' behavior without the use of coercive means (i.e., consequences or verbal reprimand).	4.62	1.19	7.38	1.67	2.76
16	Restructure the curriculum so that every child can succeed,	6.62	1.61	7.50	1.71	0.88

regardless of their academic history.

17	Communicate with students using expressions that are familiar to them.	6.62	1.39	8.44	1.71	1.82
18	Personalize the classroom so that it is reflective of the cultural background of my students.	5.77	1.36	7.56	1.55	1.79
19	Establish routines for carrying out specific classroom tasks.	6.38	1.39	8.25	1.13	1.87
20	Design activities that require students to work together toward a common academic goal.	6.85	1.57	8.25	1.18	1.40
21	Modify the curriculum to allow students to work in groups.	7.62	1.33	8.63	0.89	1.01
22	Teach students how to work together.	6.54	1.94	8.06	1.73	1.52
23	Critically assess whether a particular behavior constitutes misbehavior.	5.46	1.66	7.88	1.31	2.41
24	Teach children self-management strategies that will assist them in regulating their classroom behavior.	6.00	1.41	7.69	1.20	1.69
25	Develop a partnership with parents from diverse cultural and linguistic backgrounds.	5.77	1.74	6.69	2.27	0.92
26	Communicate with students' parents whose primary language is not English.	5.15	2.88	5.38	2.36	0.22
27	Establish two-way communication with non-English speaking parents.	5.38	2.33	5.38	2.60	-0.01
28	Use culturally appropriate methods to relate to parents from culturally and linguistically diverse backgrounds.	5.92	1.80	6.06	2.52	0.14

29	Model classroom routines for English Language Learners.	6.00	2.16	7.06	1.57	1.06
30	Explain classroom rules so that they are easily understood by English Language Learners.	6.15	2.34	7.50	1.51	1.35
31	Modify aspects of the classroom so that it matches aspects of students' home culture.	5.92	1.80	6.63	1.89	0.70
32	Implement an intervention that minimizes a conflict that occurs when a students' culturally based behavior is not consistent with school norms.	5.85	1.57	6.88	1.41	1.03
33	Develop an effective classroom management plan based on my understanding of students' family background.	6.15	1.57	7.13	1.31	0.97
34	Manage situations in which students are defiant.	4.31	1.60	6.63	1.45	2.32
35	Prevent disruptions by recognizing potential causes for misbehavior.	5.00	1.53	7.06	1.06	2.06

Note. CRCMSE scale was developed by Siwatu (2017); $n=16$

Perceived Teacher Candidate CRCM Development

The candidates all expressed the impact that the course and combined field experience had on their development, as they practiced the learned skills in their clinical teaching experience. The STEM teacher candidates revealed both growth and challenges in their CRCM development.

CRCM Strategies Implementation

The first and most robust theme was teacher candidates' ability to implement CRCM strategies. Most notable was their experiences in developing teacher presence as well as developing co-created norms with their students and using effective engagement strategies.

Teacher Presence as Warm Demanders

Teacher presence is important but was a struggle for many of our teacher candidates. They struggled to establish themselves as warm demanders. Leslie (T) recalled how she “was just very timid within the classroom...I want all the students to like me; I do not want to be mean. You cannot act that way with the kids. You need to go in there with confidence. You're the teacher...you need to own it.” Over time, she realized that caring for students learning meant being authoritative. Leslie recognized that she needed to “learn how to get it across in a way that works for you and for your students without harming your relationship with the students.”

Teacher presence was something the teacher candidates struggled with at first. Evan (ACP) noted that his teacher presence was poor in the beginning because of his “nonconfrontational demeanor”. However, through practice, he felt “like my presence at their table will make them straighten their posture... put their phone away”, recognizing him as a caring authority in the classroom. Lana (ACP) admitted to a lack of confidence in her junior high classroom.

Carlos (ACP) reported that he struggled to establish his authority in the classroom. He recalled

When I started out, I asked the student to hand me their phone because they were playing with it. In addition, then they said ‘no’ and then I told them ‘I’m sorry.’ So I have definitely grown from a language of negotiation to a language of authority. In addition, I’m a lot more comfortable with it.

Establishing teacher presence is key to teacher candidates’ ability to consistently enforce expectations and norms. Over the course of their experience and with the course support, they were able to improve in this area.

Classroom Expectations and Co-created Norms

The course commenced with the importance of co-created norms and emphasized the need to establish routines at the start of the school year. All the candidates agreed that developing, implementing, and consistently enforcing classroom expectations, routines, and procedures was foundational to good management. As learned from the course, Ava (T) stated, “Creating the co-created norms – I think that’s so important.” She noted how “creating it together” helps to “make sure that everyone is on board, and we know why we’re on board”. This process was instrumental in establishing a shared understanding of classroom

expectations. Zane (ACP) concurred with this process and reported that establishing co-created expectations helped students understand what was expected. This helped to set the tone and maintain a classroom order conducive for learning. Leslie (T) recognized the value of clarifying expectations during labs. She noted, “In regard to labs, even if it is common sense to you, it might not be for the students. Therefore, it is very important to set the expectations beforehand.” Teachers who did not “set the expectations clearly beforehand, ask questions, make sure that they know it, otherwise it is chaos.” In those instances, “things end up getting broken or not getting finished on time. Whereas with those expectations in place, it just tends to run a lot more smoothly.” Mentors also supported the students’ CRCM by modeling key strategies such as the ability “to access all students at all times” (Evan, ACP) to ease managing nonproductive behaviors and enforcing expectations.

Consistency was also a key area of emphasis among the STEM teacher candidates. Javier (T) emphasized the importance of consistency in applying agreed-upon expectations and routines, saying, “I think it was all about consistency. So being consistent with those expectations being consistent with the routines... I feel like I have grown a lot in terms of classroom management”. Jada (T) knew that she had to consistently apply her classroom management after seeing the impact of failing to do so. Over time, she felt accomplished when “my students know what I expect of them” and when they adhered to community-established norms. Zane (ACP) recognized the need to remind students of expectations by redirecting them: “Hey guys, we need to go over some expectations really quickly”. He knew it was important that he “go over the expectations with them” to get them refocused. Here, Zane (ACP) used norms as a tool for redirection, as was taught in the course.

Engagement Strategies

Maintaining student engagement was a challenge initially for the teacher candidates, as they navigated labs and managed the classroom. Monica (T) struggled with receiving student attention during group activities. She found that over time, using the “if you can hear me clap your hands” method “worked in the beginning, but after a while they just clap and won’t look at me.” Through the course and coaching, she was able to find a method that worked by seeking student input for a new attention-getter. Students were able to bring in their own culture, as they found something they could relate to through popular song lyrics. She found that she frequently had to “reset” her classroom expectations and was challenged by a lack of student motivation and classroom behavior. However, after learning about creating behavior lessons in the CRCM course, she was able to address the root cause more intentionally.

The teacher candidates also realized that by using the inquiry method taught throughout the program, student engagement improved, thus resulting in on-task behaviors. Leslie struggled with engagement at first. However, once her confidence grew as she implemented inquiry-based lessons, she observed improved on-task behaviors. Leslie commented that “with the inquiry teaching, you're making them do most of the work. So even though they are talking here or there, they're still working together, doing their assignments, doing their activities or card sorts, and throughout this whole time, they're learning.” By increasing student engagement, secondary students exhibited more on-task behaviors, minimizing disruptions.

Development of Student–Teacher Relationships to Create a Classroom Community

The second theme revolves around the CRCM tenet of creating caring communities. Creating a classroom community developed in a variety of ways. All the candidates recognized the importance of fostering respect and kindness, creating a supportive atmosphere for all the students, and getting to know the students personally while maintaining a professional relationship. STEM teacher candidates not only got to know their students but also learned about students’ backgrounds so that they could incorporate aspects of their culture into their lessons and learning. Javier (ACP) specifically “asked them questions about themselves... and their interests... and take that into consideration for future lessons”. As a result, the students felt that they were an asset to the classroom community by “being seen”.

Teacher candidates specifically emphasized their growth in creating a classroom community that focused on student–teacher relationships. Candidates saw the need to develop strong connections with students by using a variety of methods, such as learning students’ names and interests and attending student events to show support. In return, students seemed to feel valued in fostering a stronger classroom culture. Ava (T) “always like[d] to stand at the door and just wave at them.” Monica (T) recognized the need to “learn their names in one week and get to know them”. She noted the effort it took to intentionally “connect a lot with the students” to build the caring community she desired. Evan (ACP) stated “the biggest thing that I’m learning right is now that relationships are so much more.” He recognized that when the students think “this person cares”, the students were more likely to stay engaged. Javier (T) recognized that he had to be proactive in creating relationships with students. “Every day... I ask them questions about themselves... so I could learn what their interests [are].” However, for him, building relationships was not restricted to student-teacher relationships but also extended to

student-to-student relationships. He explained, “I also have them, if they wanted, to share with the class that they could as well so that they can even grow with each other.” He saw this as instrumental to the overall classroom community.

Collaboration in the classroom was also an important strategy that teacher candidates learned to intentionally use. Zane (ACP) ensured that hands-on activities were provided to engage students in group work. By solving problems through engaging in inquiry lessons, students learn more about each other and develop a team approach to learning. Javier (T) incorporates a “Do now” activity where daily, he would “ask them questions about themselves”, which created a culture of respect and safety as they all learned about each other. Collaboration was important to Zane (ACP), although he recognized the need to be vigilant, as “there’s certain cliques where a pair will work”, while the others “just stay in the background.” By modifying groups frequently, he was able to ensure that all the students participated equally while also getting to know other classmates. Jada (T) reported that partnering her emergent bilingual students together for certain assignments helped build student relationships as they navigated language learning through the content. The students appreciated it because they told her “She helps me. I help him”, which supported their learning needs through collaboration.

Interacting with Families

One major challenge noted by candidates was the lack of interaction they had with families. Many felt they needed to see models of how to email family members, conduct a conference, and general interactions that develop a teacher–family partnership. Ava (T) wished “she had seen more parent interactions”. She emphasized this as a gap in her overall training. This also aligns with the lack of change in self-efficacy regarding parent interactions with non-English speakers, as seen in the CRCMSE results. Zane (ACP) had opportunities to interact with parents but felt that it was “nerve-wracking” to contact them. He noted that “the more I do it, the more natural it becomes”. Candidates struggled in this area due to a lack of attention to the topic and opportunity to do so while in their clinical experience.

DISCUSSION AND CONCLUSIONS

How STEM teacher candidates are prepared to manage classrooms has long been studied. However, little evidence exists on the impact of a CRCM-specific course coupled with clinical experience on STEM teacher candidate development. We examined a single cohort as an effort to shed light on this topic. While candidates still have gaps in CRCM, the general

trend of this cohort was growth in the vast majority of the CRCMSE items as well as their growth in developing a learning environment for creating a care community and building strong student–teacher relationships, both of which align with the Creating Caring Communities tenet of Weinstein’s framework (2004). Through continued practice, teacher candidates also improved in their consistency in enforcing co-created norms, procedures, and routines. Specifically, co-created norms align with Weinstein’s tenet of CRCM strategies, where students are given voice in the classroom. Teacher candidates also improved their authoritative teacher presence, which is often termed a “warm demander” (Bondy et al., 2013), which assisted in their ability to be consistent in their practices and hold high expectations for students.

The CRCMSE scale was used to assess specific CRCM strategies and teacher candidates’ self-efficacy with respect to those strategies, all of which align with Weinstein’s (2004) framework. With respect to the CRCMSE of STEM teacher candidates, evidence indicates that the course had some impact on teacher candidates’ perceived growth in CRCM. Across the cohort, improvement was perceived in all categories except one. Most notably, managing more extreme or defiant behaviors shows some of the greatest improvements in self-efficacy. This is especially enlightening since teachers often cite more extreme behaviors as areas where they are the least prepared and desire more support (Bowsher et al, 2018; Stough et al., 2015). These findings support the need for educator preparation programs to transition traditional classroom management courses into CRCM courses. Another interesting component that may support teacher candidates’ improved self-efficacy in this area is the highest area of growth indicated for “*Create a learning environment that conveys respect for the cultures of all students in my classroom*” (SD=3.43), a key concept infused in the CRCM course as well as in the framework tenets *knowledge of students’ cultural background* and *creating caring communities* (Weinstein et al., 2004). Scholars have indicated the need to create caring communities where students feel supported and their backgrounds and interests are valued (Tanase, 2020; Weinstein et al., 2004), which lends students to likely experience success both academically and behaviorally (MCUE, 2008).

CRCM Framework and the CRCM Course

The CRCM framework proved useful in examining a course focused on culturally responsive management practices. The key course objectives are predominantly aligned with the following tenets: creating caring communities and the ability and willingness to use CRCM practices. While there are underlying indications that teacher candidates recognized

the need to understand students' culture, as evidenced in the CRCMSE results, the interviews did not clearly produce evidence on this tenet.

Creating Caring Communities

From the very first day of the course, building a community was emphasized for the teacher candidates. The candidates in this study revealed the benefits of building caring communities and their impact on relationship building. Researchers have found that building a classroom community is one of the most important skills to hone when working with diverse student populations (Thomas et al., 2019). When teachers implement CRCM, it provides a safe, supportive, and caring environment for learning, which ultimately promotes positive interpersonal relationships (Larmer et al., 2016; Rabin & Smith, 2016). The teacher candidates in this study recognized that their efforts to build relationships and caring communities had to be intentional, but overall, the work proved beneficial.

A key gap among the candidates indicated in both datasets was the lack of preparation in working with linguistically diverse families, a key component of creating caring communities (MCUE, 2008; Weinstein et al., 2004). Teacher candidates lacked the opportunity to engage in communication and interactions during their field experience, and the course lacked time to spend much of their time covering this topic. Time could be spent role-playing possible scenarios, strategies for working with linguistically diverse families could be discussed, and these interactions during their clinical field experience could be observed. Future teachers must learn how to partner with families to support student development and develop confidence and skills in this area. The evidence in this study points to needed modifications in the CRCM course as well as their clinical field experiences regarding family engagement, specifically with linguistically diverse families.

Using CRCM Practices

Evidence consistently points to the highly effective practice of stating expectations (Reinke et al., 2013; Simonsen et al., 2008), yet novice teachers consistently struggle with assertiveness to do so (Brown, 2004; Bondy et al., 2007). All the candidates recognized that they initially struggled with establishing, implementing, and consistently enforcing expectations in their classrooms. The CRCM course initially taught them how and why they co-created norms. Most teacher candidates found them to be useful, as they provided a voice to students and could be referenced to redirect students off-task. They recognized that student buy-in was what made the difference in enforcing the expectations. Weinstein (2003) noted

the value of the physical setting to be stable and supportive in enhancing academic learning goals. Co-created norms allow teachers and students alike to discuss norms and add clarity to the expectations, routines, and procedures of students, an important component of establishing behavioral and engagement expectations (Bondy et al., 2007). Over time, all teacher candidates determined that providing student voice in co-created norms versus teacher-directed norms made a distinct difference in their classroom atmosphere. Many in this cohort of teacher candidates were allowed to practice establishing co-created norms with students in an authentic classroom, reinforcing what was learned in the course. This is not only a CRCM strategy but also aiding in building a caring community of learners (Weinstein, 2004).

While challenges were revealed among the teacher candidates in this study, the ability to practice CRCM strategies in the field and discuss them in the CRCM course proved to be fruitful in addressing these challenges. Students struggled with authority, consistency, and specific strategies that did not fit the classroom culture desired by the students and had to reflect on why a strategy may not work. For example, teacher candidates recognized the need to consistently revisit expectations and reinforce routines in the classroom. However, many authors have reported that they cannot determine what might be considered a universal management tool and apply it successfully without considering culture. Teacher candidates begin to examine when a strategy, such as the attention getter, was not working and found a way to connect with students' culture. The course also challenged teacher candidates to examine their biases and view students through a culturally responsive lens, resulting in growth over the semester. With support, the STEM teacher candidates persevered and improved their CRCM craft. While challenges still lie ahead, the foundation of the candidates has solidly opened their eyes to the needs of students in the diverse classrooms that await them.

IMPLICATIONS

In this study, we examined the development and growth of a cohort of STEM teacher candidates who completed a CRCM course along with their clinical field experience in our UTeach program. In general, the clinical teachers demonstrated growth after such a combination in their final training, and it was worth the transition from a more traditional approach to teaching classroom management. We know that traditional methods of training teacher candidates in classroom management are not always effective, as some programs offer very little classroom management training (Pomerance & Walsh, 2020).

Coupling a CRCM course with clinical teaching experience provides a unique opportunity to intentionally evaluate one's own culture and that of their students. Ideas of a "culture clash" (e.g., Milner et al., 2019) have surfaced in the literature, likely due to a cursory examination of culture and its impact on how a teacher manages and students behave and reacts to teachers' management styles. Teacher preparation programs must examine their classroom management courses and their ability to prepare teachers for classrooms, which will continually become more diversified as the U.S. population continues to change and grow. This study provides some evidence that classroom management focused on the CRCM framework, which views behavior through the lens of culture, is needed. Implementing such a course requires a policy change in current practices. Preparation programs have become too comfortable with the status quo, which is not where we should settle. Sadly, classroom management continues to top the list as to why teachers leave the field (Heller et al., 2019). Our approach to preparing STEM teacher candidates, an area already in high need, must change if we desire to provide equitable learning opportunities to underserved communities by retaining highly qualified STEM teachers.

The teacher candidates in this study were trained in one of two pathways: traditional undergraduate certification or ACP. In our UTeach program, the course was only required for the ACP teacher candidates because of their limited exposure to the classroom. This poses a limitation due to the two varying perspectives and experiences. As such, there is a need to focus on specific populations, undergraduates or ACPs, in terms of how the CRCM course impacted them. This may inform scholars of how prior experiences of career-changers in an ACP might influence their views on managing diverse classrooms.

While this study is over one small cohort of clinical teachers who took a CRCM course, it should serve as a springboard for other UTeach and STEM teacher preparation programs to examine how such a course may benefit their students. We hope that other programs will be aware of this gap in CRCM training by implementing CRCM training for their faculty, who teach classroom management. Additionally, more and varied research must be conducted to more accurately identify what makes a management strategy culturally responsive. This includes the use of various methodologies, specifically mixed methods research, and larger samples to provide more generalizable findings.

In summary, revamping current classroom management courses to align with the CRCM framework (Weinstein et al., 2004) is necessary for training new teachers in the ever-evolving diverse society in which we live. We must take up the call to revamp and update the classroom management policies as indicated by Williams et al. (2022). We also echo the call to incorporate more social justice into the UTeach program,

specifically in classroom management. Discounting the influence of culture, both that of the students and that of the teachers, on behavior places a risk of retaining highly qualified STEM teachers. Suppose the desire is to provide equitable opportunities for underserved and under-resourced communities. In that case, teacher preparation programs should step out of the status quo and reinvent classroom management in innovative ways to incorporate CRCM.

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