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An Instructional Technology Facilitator's Role in Culturally Responsive Pedagogy Using a Critical Race Theory Lens

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Abstract

The author of this article utilized a Critical Race Theory (CRT) framework to evaluate the effectiveness of instructional technology and STEM opportunities for girls and students of color in their role as a K-5 Instructional Technology Facilitator (ITF). By defining Critical Race Theory, the role of the ITF can be leveraged to provide equitable and inclusive opportunities to learning environments. Rather than a focus on the technology tools themselves, this article offers an opportunity to explore the implicit biases that exist within each educator and leader to shift pedagogical practice to ensure that instructional technology and STEM is accessible to every student, especially those that have been historically marginalized. This article also offers an opportunity to shift thinking from technology being "inherently good," to considering who benefits from technology, and why. An ITF's perspective has the power to create a more inclusive practice for the classrooms they support which may result in being champions for culturally responsive Universal Design for Learning (UDL) to reach all students. Though the focus in this article is on the ITF role within a K-5 setting, concepts can also be applied to any coach or leadership role within a K-12 setting.

Keywords: *Critical Race Theory; UDL; Culturally Responsive Teaching; Instructional technology; Instructional coach*

"By pulling back the curtain and drawing attention to forms of coded inequity, not only do we become more aware of the social dimensions of technology, but we can work together against the emergence of a digital caste system that relies on our naivety when it comes to the neutrality of technology." (Benjamin, 2019, p. 11)

Standardized testing has become the gauge of student achievement and success in states across the country with a glaring achievement disparity between students of color as compared to white students. By focusing on the 'achievement gap, educational leaders have centered the deficits of students of color as compared to their white peers. Rather than use standardized testing as their main guide and center a student's deficits, educational leaders and classroom teachers should evaluate their pedagogy and inequitable practices that contribute to the disparity in student achievement while considering student assets. As stated to Eakins in his podcast, "Leading with Equity," Dr. Geneva Gay states, "There is no such thing as universal good teaching because somebody determines what constitutes good teaching and those 'somebodies' are cultural beings [...] [and] their notions about what good teaching is, have been contaminated by their own cultural filters" (Eakins, 2022). Critical self-reflection allows for teachers to ask probing questions on how their content and pedagogy are being centered (Milner et al., 2019). Teachers who do not "see color" or who refer to their classroom culture as a monoculture are disregarding the strengths and assets that their students of color bring to their classroom (Hammond, 2015).

Implicit and explicit biases, especially in high stress environments like a classroom, can hinder certain students from being successful or fully seen by their teacher. Instructional technology, in both access to and application of, can be utilized to further perpetuate harmful disparities, or be a tool of empowerment for historically marginalized students. Though instructional technology is only one aspect of a classroom, it is a powerful piece of the learning environment that teachers increasingly depend on for daily instruction. In order to manage and facilitate the best practice of technology tools, many districts utilize an Instructional Technology Facilitator (ITF), or an equivalent position, as an instructional coach. In North Carolina, the Instructional Technology Facilitator plays an important part in how technology is utilized, perceived, and leveraged to support diverse learning needs. Therefore, like many leadership positions, the ITF can contribute to the disparities that exist within a learning environment or understand the structural inequities to empower Black, Indigenous, People of Color (BIPOC) students.

In this article, Critical Race Theory (CRT) is the theoretical framework to examine the problem statement, which states that technology is not being utilized effectively in K-5 classrooms to actively facilitate equitable representation in instructional technology

opportunities and STEM roles. For this writing, the author has named “instructional technology opportunities and STEM roles” as access to STEM skills and technology tools in K-5 classrooms as well as how these opportunities correlate with STEM higher education and career pathways. Through the work of two ITFs completing collaborative research in their respective districts in North Carolina, this article focuses on the role of ITFs to demonstrate the importance of their coaching as teachers shift their pedagogy to asset-based centering of their students, especially for students who are historically underrepresented in technology opportunities.

Literature Review

Through a discussion of Critical Race Theory, Culturally Responsive Teaching, and Universal Design for Learning (UDL), the following sections will help define and ground how educators and educational leaders strive to create inclusive learning environments for all learners, but more specifically, to recognize and address the continued disparities that exist for BIPOC students.

Critical Race Theory: A Theoretical Framework and Methodology

Critical race theory, or CRT, is both a methodology and a theory, which is based on race and oppressive structures and the “collective historical experience of our communities of origin” (Parker & Roberts, 2011, p. 78). Social reality defines individual experiences and CRT serves to emancipate marginalized groups and liberate them from oppressive systems. By focusing on underrepresented societal voices, critical race theorists can construct knowledge, lift the marginalized, and work collaboratively to remove barriers that exist within oppressive structures. There are five tenets that are utilized in Critical Race Theory that guide scholarship, pedagogy, and perspective: (a) Centrality and intersectionality, (b) Challenge dominant narrative and differential racialization, (c) Commitment to social justice and interest convergence, (d) Experiential knowledge and counter-storytelling, and (e) Historical context and interdisciplinary perspectives (Solorzano, 1998; Delgado & Stefancic, 2012; Han, 2019). By considering Critical Race Theory and acknowledging that classrooms are structurally inequitable, the following pedagogical frameworks have been utilized to decenter whiteness, create inclusive learning environments, and frame coaching as a leveraging tool towards equity and educational justice.

Culturally Responsive Teaching and Coaching for Equity

Hammond (2015) states that Culturally Responsive Teaching is acknowledging students' unique ways of learning, synthesizing information, and responding "with teaching moves that use cultural knowledge as a scaffold to connect what the student knows to new concepts and content in order to promote effective information processing" (p. 15). Educators must recognize that students come from a variety of backgrounds, which include both individualistic and collectivist cultures. Gloria Ladson-Billings (2014) has written much about culturally responsive and sustaining pedagogies, which center students of color and their assets as a part of the learning environment. Educators and leaders must be aware of how a brain responds to an unsafe learning environment, which is a key piece to moving students from dependent to independent learners (Ladson-Billings, 2014; Hammond, 2015). In her book, *Coaching for Equity*, Aguilar (2020) states that a "transformational coach" can be both aware of the systems that teachers and students are in as well as connect the layers that create frustration for a teacher by providing resources and learning partnerships to take action to support their students (p. 40). Aguilar signals to the importance of a coach in leveraging resources, but also centering students by taking context into account to create new practices. Understanding pedagogical practices that support all learners, such as Universal Design for Learning (UDL), is a key tool for coaches to bring to their coaching conversations.

Universal Design for Learning

Initially grounded in supporting neurodiverse students, UDL is a framework of research-based practices that guide teachers through pedagogical decision making (Kieran & Anderson, 2019). These UDL practices were created by researchers in the mid-1990s to bring computer technology to students with disabilities (Doran, 2015). Today, UDL gives teachers the opportunity to reflect on their pedagogy to ensure that all learners become "expert learners" and gives students strategies on how to be resourceful and goal-oriented (CAST, 2018). Doran (2015) asserts that, "UDL provides a roadmap for educators to think through the process of identifying barriers to learning and working to remove them" (p. 4).

The UDL Framework considers all learning styles and steers away from one lesson or unit for all students. There are three main components of UDL, as described by CAST (2018): 1. Provide multiple means of engagement, 2. Provide multiple means of action and expression, and 3. Provide multiple means of representation. These three components allow for educators to pinpoint a desired instructional need, but also correlates with how students learn. UDL is often connected to special education or

accessibility accommodations such as closed captions, voice-to-text transcription, or screen magnification. Cognitive barriers can be more than dis/ability, but also how a student feels centered within the curriculum or learning space. Brown et al. (2021) states, “As the number of students with different cultural background [sic] increases in schools, technology has the potential to provide cultural representations of phenomena that matter in their lives” (p. 10). This quote is a reminder of how culturally responsive use of technology can bring change to students, including those who have been historically underserved.

Gaps in the Literature

The intersectionality of equity, social justice, and innovation within the context of educational technology has come to the surface over the last several years. Though research literature is moving towards inclusivity with regards to pedagogy and instructional technology, understanding how race and ethnicity affect an educator’s teaching choices have yet to be a prevalent part of professional development or teacher educator programs. Using CRT allows educators to critically evaluate the normed discourse surrounding instructional technology and pedagogy and identifies it as another system centered around whiteness that continues to marginalize and oppress people of color.

Transitioning from theory to practice is critical when rethinking teaching moves and creating impact for students. Most of the literature emphasizes the importance of why educators should utilize culturally responsive UDL practices, especially through instructional technology, but may not present explicit pedagogical examples for teachers to reshape their practice. Again, the goal should not be to provide educators with a checklist, but to offer teaching practices that support a paradigm shift to culturally responsive learning spaces that reflect that some students have been continuously marginalized. These themes and theoretical framework are the driving force behind the following research questions.

Methods

Participants

The co-researchers in this study are both ITFs in North Carolina who serve their districts in different ways and conducted the following research in Fall 2021. For anonymity of all the participants, the respective districts are named District A and

District B. Even though both districts are geographically close to each other and have similar demographics, District B has a much larger population of students (Table 1).

Table 1

District A and B Demographic Comparison

Demographics	District A	District B
Number of schools	10	37
Total student population	4,443	20,606
Racial and ethnic makeup	63% white 18% Black/African American 9% Hispanic/Latinx 7% two or more races 1% Asian/Pacific Islander 1% Native Hawaiian/Other Pacific Islander and 1% Native American or Alaska Native	63% white 15% Hispanic/Latinx 14% Black/African American 6% two or more races 3% Asian/Pacific Islander 0.1% Native Hawaiian/Other Pacific Islander and 0.1% Native American or Alaska Native

The ITF in District A supports two K-5 elementary schools with approximately 670 students while the ITF in District B supports ten K-5 elementary schools with approximately 6,384 students. All participants were K-5 teachers and/or students who volunteered to participate in either surveys, focus groups, co-teaching plans with the ITF, and/or interviews.

Procedure

To explore the problem statement that states that technology is not effectively being utilized in K-5 classrooms, the co-researchers used the following three questions to guide their work:

1. What is the role of the instructional technology facilitator in supporting teachers as they use technology to facilitate equitable representation in STEM, both in opportunities and future career pathways?
2. How can an instructional technology facilitator support a teacher in evaluating their pedagogy through an asset-based lens?

3. In what ways can a meaningful learning partnership be cultivated between an instructional technology facilitator, teacher, and student by collaboratively developing a lesson that centers students' voice and choice?

Data Collection and Analysis

The Role of the Instructional Technology Facilitator

A survey and follow up interviews were conducted with administrators, support staff, ITFs and teachers in both Districts A and B (Appendix A). With a 22% response rate from 72 participants in District A and a 19% response rate from 102 participants in District B, when asked, 'In one sentence, share what you know about the role of the Instructional Technology Facilitator,' most survey respondents recognized the ITF role as instructional support not as much for technical support (Appendix A). Only two respondents did not know what an ITF role entailed. Defining the role of the ITF is important in terms of colleagues knowing how to ask for instructional support and coaching. The survey also asked respondents to share how often they utilize the ITF for instructional and technical support with once a week, once a month, once a quarter, once a year, or not at all. District A (Figure 1).

Figure 1

District A: Frequency the Instructional Technology Facilitator Utilized for Instructional Support

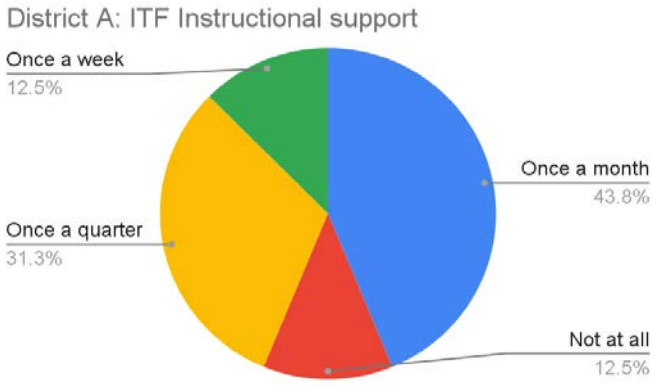
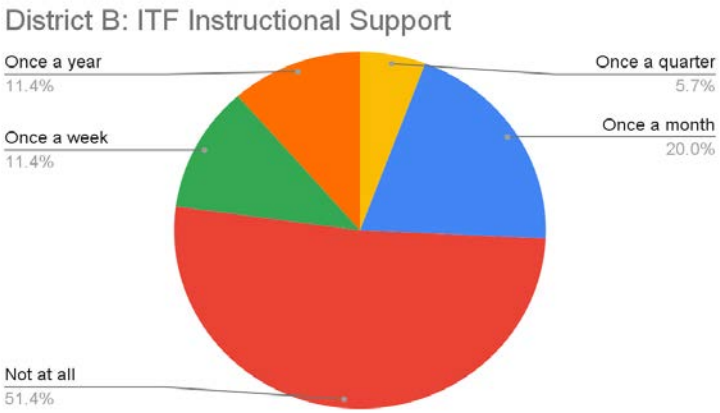


Figure 2

District B: Frequency the Instructional Technology Facilitator Utilized for Instructional Support



By reviewing both districts in Figure 1 and 2, it is clear to see that staff reach out to the District A ITF more often than compared to the District B ITF. This may be because the District A ITF is able to serve a smaller population of students and schools as compared to the District B ITF, and is, therefore, more readily available.

Survey participants were asked the open-ended question: “What is the role of the Instructional Technology facilitator in supporting teachers as they use technology to facilitate equitable representation in STEM, both in opportunities and future career pathways?” (Appendix A). There were three major themes that surfaced from this question: professional development, resources, and planning (54.9%); unsure what STEM is or how an ITF can support it (35.3%); and disparities and underrepresentation in STEM (9.8%). Of the participants noting disparities or a need for equity in STEM, no one named race or ethnicity explicitly, but rather used vague adjectives. One participant used ‘underrepresented populations’ while two others used the word ‘diversity.’ One participant noted the need for equality between ‘male’ and ‘female.’ These responses helped the co-researchers understand that messaging on the ITF role, as well as acknowledging the existing disparities in STEM and technology with explicit references to race, ethnicity, and gender, can help give educators context as to why the ITF coaching role is significant in facilitating equitable representation in STEM opportunities and career pathways.

To get a better understanding of these responses, the co-researchers completed follow-up interviews with participants who completed the initial survey. Of the 51 participants, seven volunteered to give more insight into their responses. Four

participants were from District A and three from District B and all worked as educators or ITFs in a K-5 setting.

Through these conversations, it was clear that respondents understood the ITF role as a focus on instructional support rather than technical support. Overall, participants from both the survey and follow-up interviews were able to define the disciplines included in the acronym STEM, but were less clear on how to integrate it into their classrooms as lead teachers. Though teachers may be able to identify what the letters in STEM stand for, providing intentional coaching and modeling around STEM challenges and skills would be an appropriate next step. Educators may also need explicit context on the existing disparities that could influence their pedagogical moves.

From 2019-2021, teachers in District A completed a school-wide book study utilizing the book, *Culturally Responsive Teaching and the Brain* by Zaretta Hammond. Their responses included defining asset-based learning and the importance of centering students' strengths. Furthermore, half of the teachers in District A stressed the importance of having an ITF based at their school versus being shared between schools, especially focusing on one-on-one coaching and co-teaching opportunities.

Overall, it was clear that those who volunteered to respond to the survey and follow-up interviews felt that the ITF plays a key role in supporting teachers as they use technology though they were unsure how to facilitate equitable representation in STEM, both in opportunities and future career pathways themselves. The data identified the areas of opportunities for both ITFs to support teachers in the classroom, not only with defining STEM and its adaptability within their core content areas, but also to consider ways to demonstrate how to create an equitable, inclusive classroom environment. The co-researchers found that the ITF is a key facilitator for supporting teachers in their understanding of instructional technology, its connection with STEM, and a teacher's understanding of current disparities that exist in STEM and technology.

Coaching With an Asset-Based Lens

Utilizing the initial survey, participants in both districts were able to note their interest in participating in a co-teaching opportunity with their respective ITF. The participants knew that working with their ITF meant coaching, co-teaching/modeling, and leveraging their lesson through an asset-based lens with instructional technology. Six teachers from District A and five teachers from District B volunteered to complete a pre and post survey to evaluate their progress in understanding what asset-based and Culturally Responsive Teaching meant for their students and classrooms, a professional development session on culturally responsive UDL, and a Coaching Work Plan. After initial coaching sessions, both researchers led a professional development (PD) on

Culturally Responsive Teaching with an asset-based lens utilizing a UDL model for all participating teachers in their respective districts. This one-time PD helped define asset-based learning and UDL and gave teachers an opportunity to reflect on ways that their lessons leveraged instructional technology to meet the needs of all students.

Figure 3 and 4 displays the results of the pre and post survey of District A and District B separately. The pre survey was completed by teachers prior to completing coaching work plans, completing a professional development session on culturally responsive UDL, and co-teaching with their respective ITF. The post survey was completed by teachers after the named activities above were completed and after working collaboratively for approximately three months during Fall 2021. The pre and post survey was intended to gauge the teachers' understanding of asset-based and Culturally Responsive Teaching and their ability to find research-based resources to support asset-based and Culturally Responsive Teaching practices. As mentioned earlier, District A had completed a book study on *Culturally Responsive Teaching and the Brain* by Zaretta Hammond, where terms such as asset-based and culturally responsive were defined. District B were not exposed to these terms in an official way prior to the pre survey. Figure 3 demonstrates that teachers in District A felt more confident in their answers than District B, which can be attributed to the book study they completed prior to this research. Though the teachers all showed growth in both districts, it is important to note the growth made in District B (Figure 4), where their post survey results were comparable to District A. This demonstrates that growth can happen for educators when receiving intentional coaching around culturally responsive UDL, regardless of what previous exposure the educator has received. An ITF can directly impact an educator's growth surrounding culturally responsive UDL through coaching and co-teaching support.

The pre and post survey also included open-ended questions that were centered on defining what teachers initially defined as asset-based teaching. In the pre-survey, in District A, 4 out of 5 teachers (80%) participants were able to define asset-based learning. In District B, none of the teacher participants were able to define the meaning of an asset-based learning model, however, they responded with an excitement to learn more.

Figure 3

District A: Pre and Post Survey on Asset-Based and Culturally Responsive Teaching

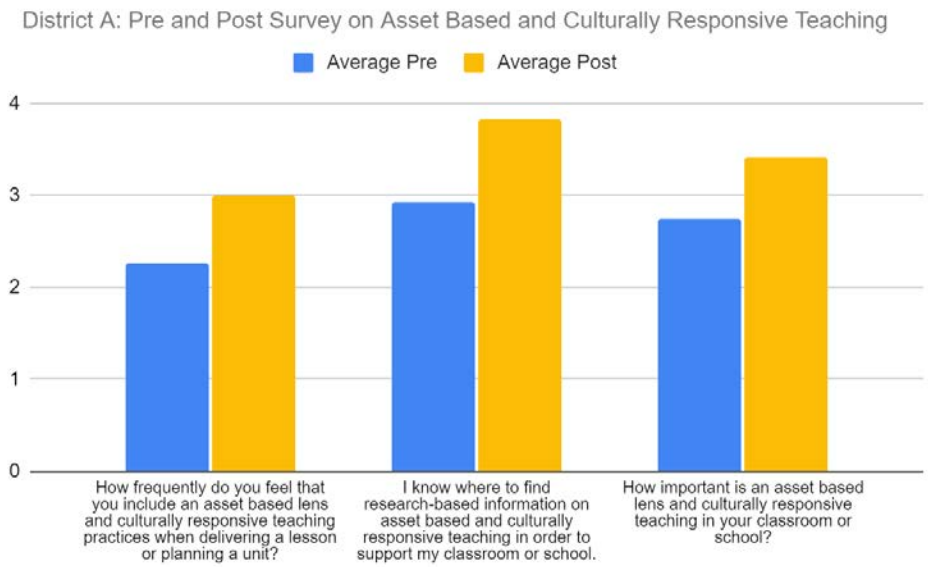
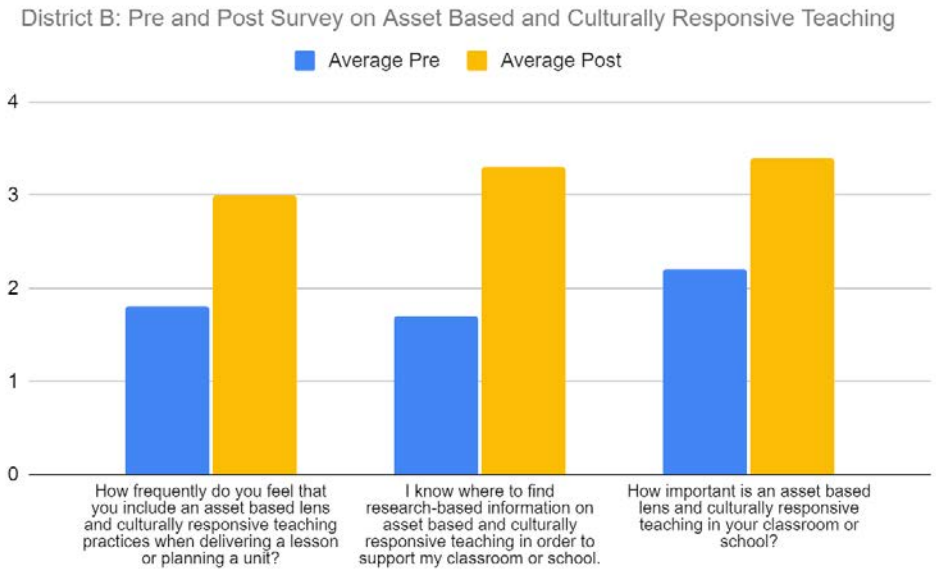


Figure 4

District B: Pre and Post Survey on Asset Based and Culturally Responsive Teaching



Co-researchers utilized a Coaching Work Plan to guide their coaching conversations and ground themselves with the North Carolina content standards as well as the North Carolina Digital Learning Standards for Students. The Coaching Work Plan provided clear expectations on the role of the coach, teacher, and student to center student strengths. Each of these lessons and examples of how they centered student strengths are included in Appendix B.

Throughout, the co-researcher took field notes that were not shared with the teacher or students to make note of anecdotal experiences in a coaching session, a classroom lesson where the coach interacted with the teacher and/or students, or to make note of considerations the coach might need to make. These field notes allowed the ITFs to refer to their interactions with students, teachers, or takeaways from their coaching sessions or teaching moves that occurred over several weeks in Fall 2021. Table 2 highlights the key strategies or instructional models that the researcher noted when coaching a teacher or co-teaching. Some of these quotes came from direct conversations or from observations the coach made that influenced their next steps in coaching. The co-researchers were intentionally looking for ways historically marginalized students had access to the technology tools, were perceived by the teachers, and utilized pedagogical strategies or instructional models to support the classroom teacher with an asset-based lens.

Table 2

Pedagogical strategies and instructional models utilized during coaching work plans

Pedagogical strategies and instructional models	Example Quotes from Field Notes
UDL strategies (engagement, representation, and action and expression)	“One student said, ‘This is really cool! I like that my teacher can help me find where to go because I need help sometimes and have to wait and miss directions sometimes.’”
	“It was clear that student choice had them hooked into the writing, especially knowing they would be recorded. [...] There was one young man who I’ve seen “asleep” in this class before and was revising and ready to re-record their episode due to mistakes.”
Deficit versus asset-based lens	“She did mention an ELL student as being unable to meet the goal, but hoping to show growth by providing something different.”

	"She talks about students in a way that is asset based and gives them many opportunities to join rather than expect compliance (she mentioned that 6 years ago, that's what she demanded and it caused unnecessary conflicts/power struggles). She speaks about her students in a way that demonstrates every student has something to offer and therefore, is capable of being successful in her class."
	"It goes to show that our perceptions of students, coaches included, can underestimate a student's potential."
Co-teaching and coaching support	"[The teacher stated] 'I'm not sure if I would have made this happen in an intentional way if it weren't for working with you.' [We] have worked together for years in a collaborative way, but this is the first time she wanted feedback on a lesson without me helping teach it."
	"My feelings after today were that if I did a PD on this lesson I think [the teacher] would be excited about it, but not really take it back and try it. Being able to go into the classroom and teach alongside her is more personal for the teacher's growth and to see in real time how it works."
	"[The teacher stated] I always forget to give them a chance to present or share their work at the end of a big project. So, this [coaching] really helped in making sure I didn't fizzle out before students got a chance to do that."
Naming race and culture	"[The teacher] had mentioned how she intentionally wants her white students to hear about the lived experiences of her students of color. She has noted that in her own experience, she doesn't have BIPOC folks that she regularly hangs out with, which centered her perception of lived experiences in whiteness. The language this teacher used made it clear that she felt comfortable enough to name race as an identity and seemed to be a key motivator for her in ensuring student voice is given space."
	"Teacher pointed out a houseless student and said, 'he's a Black boy' and wouldn't know how to use his device due to lack of prior experience. Decided THIS would be my focus; made note about how to address this during the asset-based training and UDL."
	"Every student that was referred to with a deficit-based connotation was a student of color."

The author felt that a variety of tools were necessary to define asset-based, Culturally Responsive Teaching, but also to make decisions during their coaching session that can help teachers navigate their new pedagogical approach. Reflection time for the ITF is a crucial piece to be able to continue to support the teacher and students as they learn a new tool and approach while noticing the impact it may or may not have on historically marginalized students.

Race was not ignored, but rather an intentional consideration by the ITF during this process. For example, “Every student that was referred to with a deficit-based connotation was a student of color,” was an important private note that guided the ITF to approach their own co-teaching moves. In this specific example, this influenced the ITF to work more closely with a specific student that was being perceived with a deficit-based lens when both the teacher and ITF provided support for collaborative work. The ITF scaffolded support for students to successfully complete the task and, with permission from the student, shared their work, along with others, as part of the closing. By highlighting the work and strengths that the students of color brought to the assignment, the ITF offers implicit, as well as, explicit coaching conversations around how students of color are seen by the teacher and their peers. Aguilar (2020) talks about the Transformational Coaching model, which includes the ‘recognize impact’ step to provide the educator with support around racial and gender identity development and white supremacy, and how they exist in systems, beliefs, and teaching moves. Aguilar states, “It’s essential to explore how dehumanizing ideologies harm everyone-including the client [educator]” (p.43). Further trust building would be needed to have intentional, explicit coaching conversations around race and microaggressions that were not able to happen during this coaching session example.

Centering Student Voice and Choice

Much of what was established in the individual coaching work revolved around how student voice and choice were the center of decision making. UDL reminds educators that the first piece to ‘Engagement’ is through checkpoint 7.1, “Optimize individual choice and autonomy” (CAST, 2018). By centering students and their assets, students are more invested in their learning as well as proud of their completed work (CAST, 2018). One teacher delivered a survey to see what tools students prefer to use as well as what tools they want to learn how to use. Another teacher utilized cards with four strengths labeled on each for students to select their strengths, but also created collaborative groups that had one of each strength represented. During field notes, the co-researchers were able to note the pedagogical shifts that happened because the ITF brought the conversation to how the tools can be used to center students, not how the

tools can deliver the content. Every teacher that worked with their respective ITF utilized the idea of student choice in many ways, whether it was through a choice board or by asking students what tools or activities they would want to learn to use through an interest survey.

As the students engaged in the content with both the ITF and the classroom teacher, it was important to center student reflections by having small groups of students participate in focus groups. The co-researchers each met with two student focus groups with 5-7 students in each group from their respective districts. The co-researchers also facilitated a focus group involving all teachers who participated in the coaching sessions in Fall 2021. Table 3 demonstrates the questions asked and provides either general statements made by the groups or direct quotes made by either students or teachers. The intent of the focus groups was to gather the student and teacher perceptions of instructional technology, whether it supported their learning or instruction, and how the experience of co-teaching with the ITF affected the outcome of the lesson/unit. Students were able to voice ways they enjoyed using tech in their classrooms and how they felt about having a tech integrated lesson. Students described feeling “excited” whereas teachers described feeling “overwhelmed” or “uncertain” as the lesson was new for them. Although teachers acknowledged that students could demonstrate their strengths by centering students with the use of instructional technology, it does require extra effort to meet, plan, and implement a new lesson or unit. Overall, both students and teachers that participated in the lessons and units that were supported by the ITF felt that the experience was valuable, especially since it was clear that students were more engaged and vested in the projects themselves. Some students stated that having an ITF co-teach with their teacher allowed for another opinion and described the value of a meaningful learning partnership between teacher, coach, and students.

Table 3

Focus group qualitative themes from students and teachers

Question	Themes from student focus group	Themes from teacher focus group
Thinking back of what we have discussed today, how can technology be used to highlight your *[or your students’]* strengths?	Immersive tech like VR/AR helps for ‘hands-on’ learning	Students were able to shine in different ways based on their strengths

	Enjoyed learning more ways to use a device or tool Helps with communicating better (writing versus speaking)	Tools like Flipgrid enabled them to process their individual thoughts without being influenced by peers
For students: When the lesson was introduced in your class that included my help, how many of you were excited about the assignment? Were any of you bored with the assignment? Why or why not? ***For teachers:*** When the lesson was introduced to your students, how many of you were excited about the assignment? Why or why not?	Excited for student choice Excited to work with other students Seeing the ITF meant they were going to have "fun with tech" None mentioned being bored or reluctant about the assignment	Overwhelmed and uncertain because of the new tool/lesson, but felt supported with ITF Project was able to be completed because of the ITF's support Excited to take a lesson to another level Teacher was able to see how providing activities with student choice and voice had the students engaged in learning
How did you feel at the end after the assignment was complete?	Proud of their work Motivated to revise mistakes for a better final presentation Felt like the understood content better	Felt like students took more ownership of their work Felt like all students could benefit from asset-based lessons with integrated tech, not just high flyers
What else do you want to share with me as your ITF?	Having another adult in the room during a project/lesson helps with "voice" since there is another opinion	Processing and planning with ITF allowed for redefinition of their lesson Co-teaching is more valuable than sitting in a PD

The co-researchers noted the themes above after comparing all focus group notes. These themes demonstrate that meaningful learning partnerships can be cultivated between an instructional technology facilitator, teacher, and student when they collaboratively develop a lesson that centers students' voice and choice, as asked by research question number three. Students and teachers noted that more engagement, depth, and understanding was enabled when students were part of the lesson creation process.

Conclusions

Technology and Pedagogy Are Not Inherently Good or Neutral

Through the Coaching Work Plans and Field Note observations as well as supporting literature, the author was able to conclude that technology tools and teaching moves are not inherently neutral, and, therefore, require strategic approaches towards ensuring all students can access content, curriculum, and their learning tools. Classroom spaces will continue to exclude or limit students, especially those who have historically been underserved, if careful attention to how students are centered is not taken. When considering the racial dynamics of the educator, ITF, students, and their school culture, as a coach, it is important to ask whether every student is being centered and uplifted. When a teacher decides to use an instructional technology tool for specific students because they were ‘earlier finishers’ or demonstrated good behavior, it means that there will always be other students that will not be able to have the same learning experience. When a teacher presents the content in a uniform way and does not allow for multiple means to process or synthesize information, then student assets are not being uplifted. Having access to an ITF, who can consider a lesson or unit with a critical lens, can make an impact on how a teacher can shift their teaching and center their most marginalized students in the classroom.

District Use and Support of the ITF Role Can Affect Classroom Support

As established earlier, District A and District B utilize their ITFs in different ways due to the size and financial allotment to the positions in their districts. District A staff have frequent access to their ITF for co-teaching, coaching, or overall support as their ITF is assigned to one or two buildings. District B staff have scheduled times to expect their ITF or must schedule time in order to receive coaching or to have co-teaching as that role supports ten K-5 schools. Though the first survey establishes an understanding of the instructional support of the ITF, District B (Figure 2) utilizes their ITF less often for

instructional support as compared to District A (Figure 1). District B's more limited access to their ITF may be a cause of this.

Though professional development is also a component of the ITF role, where instructional technology tools must be introduced or demonstrated to many staff members at a time, co-teaching and coaching allows for tailored support specific to the teacher and classroom. Through this experience, the co-researchers noticed that setting up coaching sessions with clear expectations and time to process enabled the lesson or unit. Teachers felt accountable to the established coaching work plan, but also supported by the ITF by having those roles distinguished. Coaching conversations allowed for the ITF to center students and refocus the priority on how to leverage tools to utilize students' strengths rather than deficits. These conversations may vary in length based on the need or schedule, but are vital to ensuring the ITF can support the teacher and classroom. This also means that having an ITF available for informal or formal check-ins for teachers is key and should not vary from district to district. States and districts should consider how their ITFs are being utilized to evaluate best practices and inclusive use of instructional technology. ITFs should also be provided on-going professional development on coaching and how their own beliefs and understanding of racism influences their coaching work (Aguilar, 2020).

Tech Can Level the Playing Field

As educators reflect on their integration of technology, it is important to note who has frequent access to complete the higher-level thinking with technology. By having technology be an integral piece of daily instruction, especially by synthesizing information in different ways, all students can have access to learning new content. To provide space for compassionate connections, one teacher found that technology became that vehicle rather than a barrier to access. As they stated in their focus group conversation:

> "In my class, my students do not get along very well. For them to have to sit down together and type [their podcast script] out, they actually worked together more than they argued. I feel like with that technology piece in there, it brought them to a level playing field instead of worrying about handwriting or answering questions."

It is important to acknowledge that instructional technology can act as either a barrier or as a doorway to learning opportunities (or potentially both, depending on the situation), based on how a teacher chooses to center the tool. Educators cannot expect

that a technology tool will 'level out the playing field' on its own, but rather that educators themselves can empower students' learning by providing culturally responsive and thoughtful instruction. 'Leveling the playing field' means educators and coaches must equitably consider the needs of each student at all times.

Unlearning Pedagogy from Teacher to Student Centered Takes Time

Educators and educational leaders are often learning and growing from their experiences and mistakes. Many teachers will express how unsure they felt in their first few years of teaching or coaching. Being in a teaching or coaching role takes time to develop and understand, especially as a better understanding of how those roles exist in inequitable systems like education. Seeking intentional learning is crucial, especially when the 'normed' culture of a classroom is centered around whiteness. Unlearning deficit-based pedagogy from an educator's own lived educational experiences and shifting to an asset-based lens that centers a variety of students takes time. As a result, critical self-reflection, instructional coaching, and access to professional development that considers historically marginalized students need to be added to the toolkit that help shape teachers into the best facilitators of equitable learning in classrooms. As Aguilar (2020) states:

> "Educational equity means there is no predictability of success or failure that correlates with any social or cultural factors-a child's educational experiences or outcomes are not predictable because of their race, ethnicity, linguistic background, economic class, religion, gender, sexual orientation, physical and cognitive ability, or any other socio-political identity marker." (p. 6)

Though educational equity may seem unattainable, every lesson, unit, and school year is an opportunity to reshape individual implicit biases, personal lenses, and provide the best learning environment for every student. Acknowledging inequities means making intentional shifts in pedagogy, and educators should strive for progress, not perfection.

Limitations

Conducting Research During a Global Pandemic

Since March 2020, many districts, teachers, and students still find themselves navigating the demands of schooling during a pandemic. Many hoped that the 2021 school year would provide normalcy, but frequent absences, cancellations of school

wide events, and impromptu moves to distance learning made 2021-2022 stressful for all. Completing research in Fall 2021 was not easy, but the co-researchers were able to work with teachers who were willing to stretch themselves, despite the obstacles they faced. As ITFs, the co-researchers balanced what was needed for research and what was needed in the classroom. This is a common balancing act for those in leadership roles. The co-researchers reassured their participants that the coaching work would feel the same, but with added note taking to document the process. The co-researchers ensured that interviews, surveys, professional development, coaching meetings, and focus groups were not an undue burden for teachers or students to participate in. The co-researchers valued the precious time educators provided to discuss, process, and stretch current practices.

Teacher burnout continues to affect schools across the country. Of the 6,000 teachers who responded to a survey conducted in November 2021 by Teachers Pay Teachers, almost half (48%) stated they were considering changing jobs (Perna, 2022). Similar findings from a survey conducted in 2020 by the National Educators Association (NEA) stated that one in three teachers were interested in retiring early or resigning considering the COVID-19 global pandemic (Flannery, 2020). The co-researchers did not want to push teachers so far out of their comfort zone that the lesson or unit would be overwhelming. Talking about race and racial bias takes an emotional toll and requires self-reflection that some may not be able to process well during a stressful school year. Though some teachers were able to name race and racial inequities on their own, the co-researcher made note of the statements or observations that would require further follow up with teachers who were not always able to happen.

Developing trust in a coaching relationship takes time. The co-researchers not only had differences in coaching experience, but continued to support schools and classrooms with the technical needs of instructional technology, especially as remote learning was still a reality for K-5 schools. The trust required to critically evaluate pedagogy requires intentional coaching work time, including collaborative reflections that can be difficult to reserve time set aside for discussion. After two years in a technical support role due to remote learning, the co-researchers continued to recenter their roles as instructional coaches. Further research with a long-term coaching analysis would be key to evaluate how coaching can be leveraged over time to create equitable learning spaces.

Limited Number of Teachers and Students in K-5 setting

It is important to note that all participants were K-5 students or educators, which limits the scope of K-12 and higher education perceptions. The first survey the co-

researchers sent out to their respective districts was in September 2021. This was a crucial time when teachers were attempting to recalibrate what face-to-face instruction during a global pandemic looked like. The co-researchers felt that there should have been a higher response rate and made sure there were many opportunities for all potential participants. Email reminders, announcements during professional development sessions, and printed flyers were distributed to increase the possibility of response rate from both districts. Though the response rate was lower than anticipated, the number of teachers who volunteered to participate in the coaching sessions felt appropriate for the co-researchers in order to provide them with the individualized coaching sessions needed. The co-researchers acknowledge the hard work required to make a shift in pedagogy and are grateful for the time and effort from every participating educator and student.

Appendix A

Sample of open-ended responses from perception of ITF role survey, Fall 2021

Question	Example Quotes from open ended responses
In one sentence, share what you know about the role of the Instructional Technology Facilitator.	"The ITF role involves coaching our teachers so that they know how to most effectively use tech for their students' learning and for their practice as an educator." "I believe the role is to maximize the efficacy of digital tools for learning and instruction, while empowering teachers to also use technology for the best use of data." "The ITF works closely with teachers to look at their curriculum to see where digital technologies would be most appropriate for content, goals, and student improvement."
What do you know about STEM?	"It's the integration of science, math, tech and engineering into all the curriculums to create more opportunities for students to use STEM skills to access their studies." "Hands-on learning in science, technology, engineering, and mathematics that digs deeper into student learning on the standards" "Teaches students problem solving skills and creates innovative thinking and learning"
What is the role of the Instructional Technology Facilitator in supporting teachers as they use technology to facilitate equitable representation in STEM, both in opportunities and future career pathways?	"The ITF should help the teacher in locating and developing resources to support STEM instruction. Teachers need more PD to instruct students with regard to the state's student technology standards requirements. This instruction should support teachers in providing opportunities, diversity, and equality in showcasing both male and female students' aptitude towards math and science and future career pathways." "Instructional Technology Coaches can be effective in not only offering PD which draws attention to disparities in education and the stem career field, providing opportunities which support equity, and presenting opportunities for increased visibility of diverse figures."

	"The ITF models the use of an equity lens when working with students and teachers in STEM." "Their role is to expose students to a variety of different tools to facilitate engaging experiences to support their interest/understanding of STEM concepts. "

Appendix B

Co-teaching lessons that centered student choice and voice

Lesson/Unit	Examples of culturally responsive UDL in this lesson
Podcasting to build community	• Students selected partners and co-created scripts • Students chose their topic to write and record about (i.e., things they are successful at outside of school, their race or gender identity, their neighborhood, or a time they overcame something challenging)
Stop motion leadership videos	• Students identified their strengths on color coded cards (i.e., organizer, scriptwriter, video recorder, or props) • Students created groups based on each card being represented in the group • Students had creative autonomy of their video as long as it focused on a leadership skill provided by the teacher
Centering Native American authors	• Students were presented with different Native American authors each week for four weeks to center Native American voices and their experiences • Students selected center activities that allowed for a Flipgrid recording, a written or drawn response to add to a collaborative mural, a message for the map, or a favorite book drawing
Green screen historical figure recording	• Students selected a historical figure of their choice (regardless of their own racial or gender identity) • Students created a prop, background image, and decided what their "costume" would look like • Students completed a self-evaluation on their progress and goals • Students created their 1-minute speech for their green screen recording
Adobe Spark Page or Flipgrid Evidence	• Students responded to a survey on technology tools they would like to learn how to use • Students were able to choose from the top two choices: Flipgrid

Organizer	or Adobe Spark Page ● Students self-selected a non-fiction text to complete their evidence organizer ● Students had creative control over their visuals for their presentation using Flipgrid or Adobe Spark Page and presented to their peers
Designing 3D Moon Rovers	● Students designed moon rovers to explore and collect samples from the moon's surface ● Students used the engineering design process throughout their design process ● Models were created in Tinkercad and each student received a 3D model of their moon rover design
Shapes with Apple Clips	● Students reviewed their knowledge of shapes by going on a shape walk throughout the school ● Students took pictures of 2D and 3D shapes around their school building and used to create a clip in Apple Clips to display their knowledge and understanding
Landforms Choice Board	● Students were learning about landforms and salt/fresh water ● Students were given a choice of activities to participate in which included videos, learning games, and readings. ● Students were asked to brainstorm other lessons where choice boards could be used to enhance their learning.
Climate and Weather	● Students learned about weather and climate with their choice of learning by reading informational texts, videos, and/or infographics. ● Students reviewed their learning through problem solving with real world problems in a breakout box.
Reinventing the Technology Rotation	● Students wanted to reinvent their weekly technology rotation to include an interactive activity. ● Using Apple Classroom, students were able to complete an activity on the blends they were learning by taking a picture of the blend card, recording themselves reading the word, and labeling each with the name of the picture which included the blend.

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