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Theory to Practice: Professional Development for Culturally Responsive Technician Education

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Abstract

The HSI (Hispanic Serving Institution) ATE (Advanced Technological Education) Hub 2 is a three-year collaborative research project funded by the National Science Foundation (NSF) that continues the partnership between two successful programs and involves a third partner in piloting professional development that draws upon findings from the initial program. The goal of HSI ATE Hub 2 is to improve outcomes for Latinx students in technician education programs through design, development, pilot delivery, and dissemination of a 3-tier professional development (PD) model for culturally responsive technician education at 2-year Hispanic Serving Institutions (HSIs). The project seeks to do this by developing the awareness and ability of faculty to appreciate, engage, and affirm the unique cultural identities of the students in their classes and use this connection to deepen students' belonging and emerging identities as STEM learners and future STEM technicians. This paper shares the research foundations shaping this approach and the methods by which faculty professional development is being provided to develop this important and sensitive instructional capability in participating faculty.

The tiered PD model features a scaffolded series of reflective and activity-oriented modules to incrementally enrich the instructional practices and mindset of HSI STEM educators and strengthen their repertoire of strategies for engaging culturally diverse students. Scaffolding that translates culturally responsive theory to practice spans each of the four distinct topic modules in each tier. Each topic module in a tier then scaffolds to a more advanced topic module in the next tier. Tier 1, Bienvenidos, welcomes HSI STEM educators who recognize the need to better serve their Latinx students, and want guidance for small practical activities to try with their students. Tier 2, Transformation through Action, immerses HSI STEM educators in additional activities that bring culturally responsive practices into their technician training while building capacity to collect evidence about impacts and outcomes for students. Tier 3, Engaging Community, strengthens leadership as HSI STEM educators disseminate results from activities completed in Tiers 1 and 2 at conferences that attract technician educators. Sharing the evidence-based practices and their outcomes contributes to achieving broader impacts in the Advanced Technological Education or ATE Community of NSF grantees.

Westchester Community College (WCC), the first 2-year HSI in the State University of New York (SUNY) 64 campus system, is piloting the 3-tier PD model using virtual learning methods mastered through previous NSF ATE work and the COVID-19 context. During the pilot, over 20 WCC technician educators in three cohorts will develop leadership skills and practice culturally responsive methods. The pilot will build capacity within WCC STEM technician programs to better support the diversity of students, industry demand for a diverse workforce, and WCC's capacity for future development of technician education programs.

This first paper in a three part series describes the program goals and objectives, the 3-Tier PD model, and reports initial results for Cohort A's engagement in the first three modules of Tier 1.

1. Introduction

While culturally responsive instruction has been shown to increase student success for Latinx students [1] in higher education generally and STEM education in particular, its application to STEM technician education has not been well-explored or developed. This is of concern given the significant percentage of underrepresented students who attend community colleges and industry, education, and NSF goals to broaden participation in the STEM technician workforce.

Two-year colleges provide broad access to higher education and are an important source of science and engineering degrees in the US, producing 31,179 associate degrees in computer sciences and 6,048 associate degrees in engineering in 2017 [2]. They are also an important higher education destination, enrolling 36.3% of Hispanic/Latino undergraduates, 40.9% of Black students, and 38% of White students in 2016 [3]. Although Latinx students represent an increasing percentage of science and engineering associate degrees, earning 26.6 percent of science and engineering associate degrees in 2017 [3], recent research has found that under-represented minority (URM) students have a significantly higher probability of switching out of STEM and completing a degree in a non-STEM field than persisting to earn a STEM degree [4]. This trend is further reflected in science and engineering employment. Although 28.1% of the overall population aged 21 and older is from an URM group, they comprise only 13.3 percent of science and engineering occupations, with Hispanics representing 7.5 percent and African Americans representing just 5.6 percent of the science and engineering workforce [5]. For regions with significant cultural and ethnic diversity, such as the greater New York area of which Westchester Community College (WCC) is a part, increasing participation and improving outcomes for Latinx and other historically underrepresented students has been and remains a long-standing concern in STEM education, 2-year colleges, and the industries that employ STEM technicians.

HSI community college faculty recognize the need to create welcoming environments for their students, but most student support interventions in community colleges happen outside the classroom and are delivered through student-services focused support programs and interventions, such as supplemental tutoring or co-curricular programs. Within the instructional context of an instructors' professional skills, there are really very limited opportunities for faculty to learn about and develop their own understanding of students' varying cultural, ethnic and social differences and identities, and even fewer opportunities for faculty to try out new methods for integrating culturally responsive perspectives in a supportive, collegial setting. Faculty teaching in STEM technical and applied engineering settings are already balancing STEM content, theory and methods with technical applications – often in very abbreviated instructional periods for the depth of content and precision of skill needed for students to gain proficiency in STEM technical fields. And yet - neither faculty members nor students leave their cultural and self-identities at the door when teaching or learning begins. In fact, it is often this inner perspective of "who I am" that is at the very heart of what motivates both the instructor and student to be in the classroom in the first place. Intentional and supportive professional development that cultivates faculty knowledge and capability for integrating evidence-based culturally relevant methods to engage the students they teach has the potential to help faculty create the welcoming, supportive environments they seek for their students, and to enrich learning for all.

When professional development in other evidence-based methods is provided, such as for active and contextualized learning [6] and (DUE: 1700625) for industry and problem-based learning [7] and (DUE: 1204941), improved student outcomes, engagement and persistence are frequently observed, as was WCC's experience. But these strategies alone are not enough.

Culturally responsive instruction (CRI) posits that faculty knowledge, skills and mindset do matter. CRI has become an increasingly important concept in efforts to increase URM student engagement and success. Recognizing the negative effects when students feel unwelcome because of their race or ethnicity, CRI taps into the aspirations URM students have in selecting a higher education STEM pathway in the first place. CRI utilizes a set of teaching practices and learning experiences that affirm the importance of academic success while also maintaining a positive cultural identity, which helps students of color navigate their college pathways [8]. Ladson-Billings, one of the original advocates of this method, defined culturally responsive pedagogy as "… empower(ing) students intellectually, socially, emotionally and politically by using cultural referents to important knowledge, skills and attitudes…" [9]. Effective teachers focused on what was right instead of what was wrong – helping students maintain a positive identity; believing in their success; promoting high self-esteem and high regard for others; and functioning like coaches. Gay, another early proponent, also included curriculum enhancements that reflect the contributions and information relevant to the contributions of different ethnic groups in addition to culturally responsive teaching and learning experiences [10].

Efforts to apply CRI in STEM education in K-12 settings have generally resulted in two overall implementation strategies: 1) implementing all-inclusive STEM environments (such as URM STEM high schools) and 2) providing professional development that broadens faculty mindsets and abilities to promote active learning, belonging and strong STEM identities. Evaluations of all-inclusive STEM environments that compared the outcomes of participants with non-participants found initial benefits but little long-term impact on student outcomes [11], [12] and [13].

The importance of student belonging, active learning, and STEM-identity development brought about by both programmatic support and by supporting change in faculty methods shows promise. Efforts to enrich instructional practices and the mindsets through professional development are showing promising outcomes for improved student engagement, persistence, and success [1]. One of the largest studies of URM STEM students in 2-year institutions to date, used mixed methods to detail the educational journeys of 1670 community college STEM students [6] and (DUE: 1700625). Wang's study examined how students' learning experiences (including contextualized math classes), relationships and experiences with instructors and advisors shaped their transfer and other STEM outcomes. Wang's key findings were: 1) active learning improves STEM student outcomes, benefiting technician pathways over STEM transfer; 2) URM STEM students in community colleges encounter a great deal of friction that gets in the way of positive STEM momentum; and 3) finding the right "fit" within a community college intellectually and otherwise was a major determinant of "swirl" that influenced outcomes for individual students [6].

While the research on professional development in CRI in 2-year STEM technician education is very limited, similar approaches to increase gender equity in 2-year institutions have been

advanced by Williams (DUE: 1601548) who leveraged professional development for faculty on equity and inclusion practices to help improve the micro-messaging students receive, and Silvers (DUE: 1800920), who combined professional development as well as student engagement reforms to improve gender equity, marketing and student engagement and make the classroom more inviting to both women and URM students. WCC has worked with Silvers on its PAL-TEC grant (DUE 1700564) to provide professional development to faculty and other staff to be more supportive of both female and URM students. Integrating culturally responsive teaching methods is also the focus of Sauncy (DUE 1953561), Paul (DUE 1953760), and Chavarry (DUE 1928737) who similarly focus on transforming faculty interactions with URM students through professional development in culturally sustaining asset-based pedagogy and methods. Similar work is underway to specifically improve outcomes for Latino students at HSIs. Costino (DUE 1928740) is leveraging a faculty community of practice to enhance professional learning around diversity, equity and inclusion in STEM teaching and learning. Tashiro (DUE 1832335) aims to build STEM faculty capacity in inclusive practices and intercultural competence, building on a zone of proximal development for faculty understanding.

HSI ATE Hub 2 is a faculty development project that will guide educators in translating and applying theory and research on culturally responsive education to implement effective practices that are guided by knowledge, skills, values, and attitudes to improve the diversity of the STEM technical workforce. Cultural responsiveness validates and affirms by acknowledging a students' diverse heritages. WCC and the Center for Broadening Participation in STEM at Arizona State University (CBPSTEM), with assistance from Florence Darlington Technical College's (FDTC) ATE-funded Mentor-Connect project –all experienced in implementing initiatives to improve outcomes for Latinx and other underrepresented populations in the STEM technical workforce- are collaboratively implementing this project to address the need for culturally responsive technician education.

With input from experts in Culturally Responsive Instructional (CRI) methods, community college technician educators, students, and industry, CBPSTEM is leading the development of a faculty professional development model designed to improve outcomes for Latinx students in technician education programs. WCC, the first HSI in the State University of New York (SUNY) 64 campus system, is a recent first-time NSF ATE grant recipient. WCC is pilot testing the model using virtual learning methods mastered through previous NSF ATE work and the COVID-19 context. The model will be scaled for cost-effective implementation at 2-year HSIs. Mentor-Connect, along with CBPSTEM and participating faculty, will develop, test, and refine the model for national use to strengthen the diversity of the STEM technician workforce and the leadership ability of community college STEM technician educators to affect change in this arena. Over 20 WCC technician educators will benefit directly from piloting the model and developing leadership skills in CRI methods, building capacity within its STEM technician programs to better support the diversity of students, industry demand for a diverse workforce, and WCC's capacity for future development of technician education programs within NSF and other grant-supported programs. The Mentor-Connect project at FDTC manages the HSI ATE Hub resource library within the Mentor-Connect website, engages Mentor-Connect participants, and supports outreach, and dissemination. A national Advisory Council for the project meets twice each year and contributes to the improvement of project outcomes.

In the next section, this paper will describe the high-level goals and objectives of the research. Section 3 will discuss the professional development model that is applied in a pilot with a 2-year HSI as described in Section 4. The activities and impacts surrounding Community Building will be discussed in Section 5. The paper finishes with overall Lessons Learned in Section 6, the Conclusion in Section 7, and Implications for Future Research in Section 8.

2. Goals and Objectives

Three primary goals and underlying objectives guide the HSI ATE Hub 2 project:

Goals

1. Novel professional development specifically aimed at improving Latinx student success in technician education programs is developed with educational research, foundational knowledge of Culturally Responsive Instruction, and the expertise of subject matter experts.
2. The ability of community college educators to apply research-based knowledge and implement successful asset-based, culturally responsive technician education is increased.
3. Peer-sharing and micro-credentials motivate incorporation of Culturally Responsive Instruction in technician education programs within WCC, the ATE Community and 2-year HSIs nationally.

Objectives

1. An affordable, transportable 3-tier professional development training program focused on culturally responsive instruction and classroom practices for technician education is developed.
2. Faculty complete CR-ATE Training and implement culturally responsive instructional strategies to improve HSI student outcomes.
3. A process for awarding micro-credentials for achievement in CR-ATE learning and practice is developed and implemented that stimulates faculty participation and institutionalization.

3. Three-tier Model for Culturally Responsive Technician Education

The 3-tier Professional Development (PD) Model shown in Figure 1 will generate new knowledge about the adoption and use of Culturally Responsive-Advanced Technician Education (CR-ATE). The tiered PD model features a series of educational modules to incrementally enrich the instructional practices and mindset of HSI STEM educators and strengthen their repertoire for engaging culturally diverse students. Tier 1, Bienvenidos, welcomes HSI STEM educators and support personnel who recognize the need to better serve their URM students, but are not sure how to do this. Tier 2, Transformation through Action, immerses HSI STEM Educators in activities that introduce CRI practices in their technician training and collect evidence about impacts and outcomes for students. Participants will also learn about and be encouraged to seek NSF ATE grant funding to expand the impact of their work. Tier 3, Engaging Community, builds CR STEM faculty leaders and disseminates lessons learned and contributions of those who completed Tiers 1 and 2 to achieve broader impacts in the ATE Community via synergy sessions

and spotlight presentations at conferences or similar virtual events that attract technician educators.

Each tier in CR-ATE has four modules. Each module is focused on a particular topic based on needs, findings, and practices identified in the literature, Kickstarter, Mentor-Connect, the HSI ATE Hub, and other ATE and HSI projects sponsored by NSF. Webinars will be produced for each to include the culturally responsive research underpinning the module topic and show how the research may be adapted into practice for technician education with real, in-classroom and virtual examples (theory into practice). Participants will obtain a successful-practice exercise in each webinar to implement with their students. Part of the exercise will be to monitor, document, and report student impact from their work. They will also learn how to use their findings to develop more competitive ATE grants and engage industry partners in culturally responsive activities with students. As faculty build their skills and strategies in culturally responsive technician education, their successful-practice exercises and evidence can be incorporated into the resource library, with their permission. Supporting infrastructure at each institution includes a Sustainability Team that signifies up-front institutional support for CR-ATE professional development and Faculty Workgroups to maintain momentum and accountability between webinars.

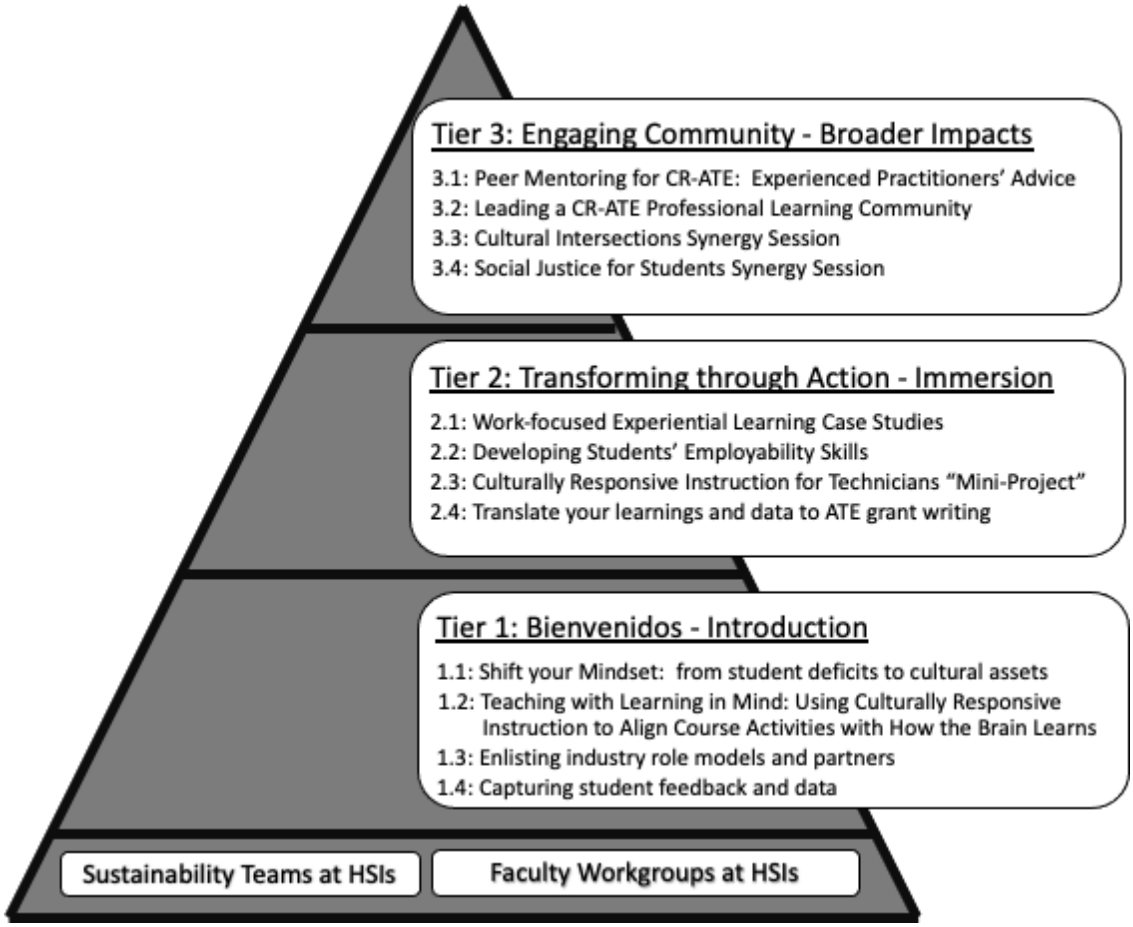

Figure 1. 3-Tier PD Model for Culturally Responsive Advanced Technician Education (CR-ATE)

A common scaffolding structure is used within each module: 1) CRI strategy/concept, 2) Self-reflection about how our experiences shape ways we perceive others and interact with them, 3) Conversation about reflections and CRI concepts and need for change, 4) Group activity that demonstrates ways to practice CRI concepts through strategies and example exercises, 5) Discussion on how and when to use an example exercise provided in the module and apply it in the classroom to earn a microcredential. Artifacts and recordings captured from the scaffolded modules will be examined to assess faculty comprehension during each training session. Tier to tier scaffolding involves: Learning foundational CRI skills in Tier 1, Practicing and applying CRI skills in Tier 2, Developing instructional leadership and encouraging adoption through peer mentoring in Tier 3.

4. Professional Development Pilot at a 2-year HSI

WCC is piloting the CR-ATE modules, supporting faculty professional development in Culturally Responsive Instruction, and building capacity for sustainability and scaling after the grant. Applied engineering and applied computing/cybersecurity are the two technician pathways targeted, along with the foundational math underlying both areas. WCC's implementation includes an administrative Sustainability Team and Faculty Workgroup. The Sustainability Team, established at onset with support of WCC's Provost and Vice President of Academic Affairs, is working at the institutional level to support the PI and Co-PI in project implementation and purposefully integrate the grant with other professional development, academic reforms, and diversity, equity and inclusion efforts. Led by the WCC PI, the Sustainability Team includes the director of institutional advancement with oversight for grants, the two academic deans overseeing the content areas, the associate dean overseeing the Center for Teaching and Learning (CTL) along with a CTL faculty lead, the PI and Co-PI, and two students – one from each technician pathway. The Sustainability Team will also determine how the micro-credential system will be applied at WCC. A Faculty Workgroup, led by the WCC Co-PI, facilitates ongoing professional learning and support for faculty participating in the CR-ATE modules. As the Cohorts advance, this group will organize as needed around various modules and/or disciplines. As faculty advance in this work, they will mentor each other and participate in internal dissemination through CTL and external dissemination through the NSF PI Conference, HI-TEC and other conference forums.

The PI and Co-PI, assisted by their Deans and the Associate Dean/Professional Development, are recruiting faculty through department and faculty meetings, professional development forums, and web-based communications. A total of 20 faculty (including the PI and Co-PI and 3 adjunct faculty) in three Cohorts from applied engineering, math, and computing over the three years are being recruited as follows: Cohort A (eight members began in Y1), Cohort B (begins Y2), and Cohort C (begins Y3). Four participants from each of Cohorts A and B along with the PI and Co-PI (10 total) will advance to Tier 2 in Y2 and Y3; and three from Cohort A (along with the PI and Co-PI, a minimum of 4 total) will advance to Tier 3 in Y3. Faculty will earn micro-credentials for completing the various tiers and modules. Faculty from earlier cohorts will assist in mentoring peers, disseminating the work internally through CTL and externally through the ATE PI, HI-TEC and other conferences. A major objective is to build WCC STEM faculty leadership for future NSF ATE grants and in applying Culturally Responsive Instruction (CRI) to technician education. Academic Affairs and Institutional Advancement will work with faculty to

apply CRI to other technician education programs. WCC is striving for equal representation from applied engineering and applied computing.

The Faculty Workgroup (led by the PI and Co-PI) meets monthly to maintain accountability and momentum. Guidelines, exercises, and tools embedded in each module, along with follow-up Q&A and dialog with the trainers help structure these meetings. Micro-credentials configured by the ASU team map directly to the exercises and tools developed in the modules. WCC is piloting the activities and providing feedback to collaborating partners as well as to evaluators so the model and training webinars can be improved.

To date, Modules 1.1, 1.2, and 1.3 in Tier 1 have been delivered to eight Cohort A faculty members who were recruited by the WCC PI, co-PI and Deans. The focus of Module 1.1 was to develop asset-based mindset by providing activities and examples to help Cohort A come to realize that students of color bring a wide range of skills, knowledge and experiences to the classroom and it is faculty's job to create an inclusive classroom environment in which students can see themselves and thrive. Cohort A Participants learned about differences in faculty and student perspectives on education, asset versus deficit thinking, cultural capital, and a few approaches for introducing culturally responsive pedagogy through self-reflection, conversation, and by viewing a demonstration of the cultural story collage activity. The session ended with a "pledge" to try a culturally responsive activity with students in an upcoming course. The activities included a community of cultural wealth worksheet, with examples of cultural capital, a cultural story collage to create and share, the bi-directional course pledge, and mastery grading. The opportunity to earn a digital badge for performing the pledged activity was provided.

A survey was conducted immediately after Module 1.1 delivery to collect feedback and a faculty workgroup session with Cohort A to discuss their feedback and questions was held a month following Module 1.1 delivery. The six survey results indicated agreement for satisfaction with the training, clarity of training objectives, understanding of the use of asset thinking in teaching approaches, and excitement to try an activity with students. Topics arose during the faculty workgroup discussion, where the Faculty wanted to see more case study examples and examples that could be used throughout the semester. Many of the activities introduced in Module 1.1 were oriented to the beginning of a semester. Some faculty had begun to try out activities in their classes. Others still had questions, and the sharing by those who already tried an activity grounded the possibilities in the context of WCC. Challenges discussed included the desire to be politically correct and sensitive to all cultures; not having enough time to implement; and virtual classroom delivery due to COVID protocols for the college. Information from both the survey and faculty workgroup discussion helped guide development and delivery of Module 1.2.

The focus of Module 1.2 was to gain an understanding of the varying learning processes of diverse student populations, expand upon the knowledge surrounding cultural responsiveness gained in Module 1.1 and participate in activities that encourage engagement in the learning experience. Cultures can shape the way we learn, think, and communicate. Understanding how best to engage culturally diverse students has the potential to help them sustain their motivation to excel/successfully complete their STEM coursework. As in Module 1.1 faculty engaged in self-reflection, conversation, a demonstration, and ended with a "pledge" to try an activity with students in an upcoming course. In completing module 1.2, participants came to realize that

learning occurs in different ways, engagement and motivation are critical aspects of the learning process, and how to sustain culturally responsive classroom practices.

A survey was conducted immediately after Module 1.2 delivery to collect feedback. The survey completion rate was 100% (6/6). At least 67% (4/6) of the faculty agreed or strongly agreed with all statements regarding the training. As shown below, 83% (5/6) of the faculty agreed or strongly agreed the examples used during the workshop were useful, overall, the activities helped them understand how to better engage their students through a cultural lens, the training helped them better understand the differences between individualistic and collectivist cultural frameworks when it comes to engagement, and the training helped them gain a clear understanding of student engagement and learning experience through a culturally responsive lens. One hundred percent of the faculty felt the training objectives were clear. The faculty workgroup follow-up discussion for Module 1.2 was held March 10, 2022. Overall, the feedback we received was informative, affirmative and constructive. Faculty especially valued practical tips and examples related to their disciplines. Three faculty reported trying out the post workshop activities with their students which led to a discussion about how it is not always easy to learn new things, explore new things as educators, and put them into practice. It's hard to make modifications if we have not yet realized how current ways of teaching and learning could be improved. The purpose of these workshops/modules, is to engage in learning about new ways of thinking and educating. The assumption is not that everyone does a 180 within their pedagogical practice but that we become more aware and in tune with the needs of our diverse learners.

Module 1.3, Enlisting Industry Role Models and Partners, was delivered April 21, 2022. Two employees from a local utility industry shared career opportunities for technicians, the importance of building and maintaining long-term relationships at work, and their corporate culture that emphasizes employee growth and equity through career opportunities and benefits. Several follow-on activities were offered to Cohort A faculty participants to try with their students. One faculty has contacted the employees to come to their cybersecurity club and another faculty member is interested in a classroom or zoom talk for her students. When the faculty host these industry speaker sessions with their students they will earn a digital badge. Feedback from the post-module survey indicated agreement that the learning objectives were met. Eighty percent of the Cohort A faculty participants agreed or strongly agreed that the training helped them gain a clearer understanding of how to partner with local industries who might be future employers of their students. Sixty percent agreed or strongly agreed that training helped them better understand STEM career opportunities in industry for their students. Eighty percent agreed that the examples used during the workshop were useful. Faculty participants would have liked additional speakers representing other industries or a shorter workshop if one industry was represented. A suggestion was made that perhaps the workshop could have included a segment to inform faculty about WCC career services offerings to pass on to their students for further exploration.

5. Community Building

The project team is providing a webinar annually to feature a subset of the Tier 1 CR-ATE content to the broader ATE Community via a Mentor-Connect-produced national webinar. At

least 50 attendees per webinar will be recruited through aggressive promotion by Mentor-Connect and their partner AACC using Social Media, Websites, and through existing networks. The Year 1 webinar was held April 13, 2022, attracting 88 registrants and 52 participants. Feedback was collected during the webinar using chat and a post-webinar participant survey to gauge the immediate impact. Results of the survey administered following the 2022 webinar indicated that 100% of the respondents agreed or strongly agreed that they were satisfied with the webinar, that the objectives were clear, that they understand the differences between asset and deficit mindset viewpoints, and understand various ways to use an "asset thinking" mindset in their teaching approach. Feedback about the most helpful aspects of the webinar included appropriate pacing of the participant activities, seeing examples and thinking about which form of cultural capital they represent, conversation among peers, and sharing of good ideas including generational differences and notions of asset/deficit. Recorded sessions are housed in the HSI ATE Hub Resource Repository within the Mentor-Connect online library. Content and professional development (PD) resources and findings from piloting the training modules will be shared during annual ATE PI conference exhibits and sessions, and HI-TEC workshops for educator adaptation or adoption. The resources will also be shared at an AACC conference and in regular communications on Social Media, Websites and through existing networks.

6. Lessons Learned

- Recruiting the Cohort through presentations at Faculty forums and using an interest survey to identify candidates greatly aided formation of Cohort A.
- Finding a common time for Module delivery and Faculty Workgroup Discussions was driven from a block of common free time for Faculty, which is an institutional practice at WCC.
- Provide more activities that can be implemented throughout the semester and not only at the beginning.
- Stage the training webinar prior to the start of the semester, if possible.
- Faculty workgroup discussions and sharing keep momentum going between training module delivery.
- More incentives and support for Adjunct Faculty are needed
- Content from Module 1.1 contributed to the annual webinar for the broader ATE community. The WCC PI and Co-PI Faculty for this project are eager to share their stories, personalize the content, and role model cultural responsiveness to the WCC Faculty and externally to the broader ATE Community.

7. Conclusion

This project is actively translating evidence-based research on culturally relevant instructional methods into supportive, collegial professional development experiences that cultivate the ability of STEM technical faculty to see, engage and affirm the STEM identities of the culturally diverse students in their classes. This work provides faculty and STEM technical and applied engineering faculty with an opportunity to reflect on the importance of belonging, connecting, and engaging the STEM identities and aspirations of both students and faculty in STEM

technician education programs. Often the demands of delivering both STEM and hands-on technical content in dense and abbreviated course sessions inadvertently results in the belief that both faculty and students are “checking” their own cultural identities and that of their students’ at the door before ”learning can begin.” As educators, we often dismiss knowing the “person” in front of us in favor of being clear about the learning outcomes we desire for our students. And yet, none of us ever leaves our identities, culture and background at the door before we walk into a classroom as either a student or instructor. By tapping into this very human and affirming acceptance of self and others, we can better ignite and empower the aspirations of our students and of ourselves as instructors.

8. Implications for Future Research

Tiers 2 and 3, and Cohorts B and C will benefit from Tier 1 and Cohort A results. Tier 1 will be optimized based on feedback from Cohort A. Additionally, Cohort A will peer mentor Cohort B’s participation in Tier 1 in year 2. The role that earning badges play to incentivize implementation and how ongoing faculty workgroup discussions support implementation of culturally responsive activities from the training will also be studied. In terms of scaling this work, annual webinars will feature speakers from the WCC Cohorts who will share their experiences and practices with the broader ATE HSI Community. Modules with opportunities to earn badges for test-driving culturally responsive activities will be made available as resources. As badges are earned, evidence is collected for which activity was tried and for the qualitative outcomes. Collection of other data may be built into earning the badge.

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DUE: 1400561 G. Kepner, Midwest Photonics Education Center. Indian Hills Community College.

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DUE: 1204941 N. Massa, Problem Based Learning in Advanced Manufacturing: Transforming 21st Century Education. New England Board of Higher Education.

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