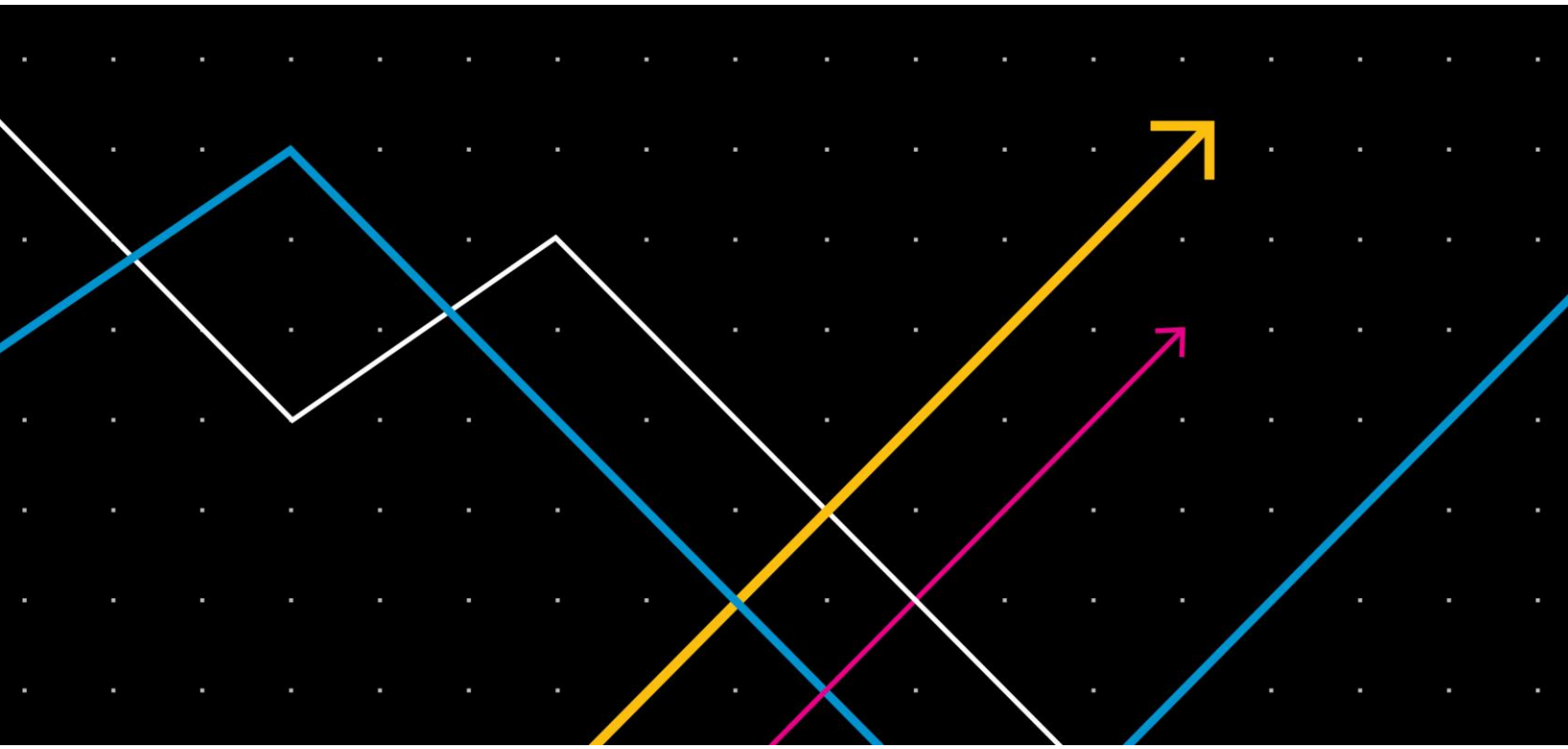

RESEARCH REPORT

Practice Insights to Advance Racial Equity in Online Postsecondary Career and Technical Education

Lessons from the CTE CoLab

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The National Council for Workforce Education

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Executive Summary

In fall 2020, the Urban Institute led the launch of the postsecondary Career and Technical Education (CTE) CoLab. This came as a response to the emergency shift to online learning that occurred during the COVID-19 pandemic amid concerns about the risks to students of color, who already faced challenges in CTE programs. A coalition of six national organizations came together to support a college community of practice consisting of 12 community and technical colleges. This work focused on a specific credit-bearing CTE program, and the CTE CoLab aimed to address racial disparities in academic and career outcomes as programs moved online and build knowledge about strategies to address these gaps. As part of the initiative, coalition partners provided coaching, professional development, technical assistance, and peer learning activities to support the development and implementation of Equity Action Plans (EAPs) aimed at effecting changes in courses and programs to address equity gaps identified by the colleges.

This report describes the goals and strategies adopted by colleges, as well lessons learned about how to advance racial equity in online and hybrid postsecondary CTE. Insights are based on documentation submitted by participating colleges, case study interviews with three colleges, and the perspectives of the staff and team members who facilitated the initiative. The purpose of the report is to provide examples of adoptable strategies and lessons learned in efforts to advance racial equity in community college CTE programs, especially those delivered fully or partially online.

College Goals, Strategies, and Lessons Learned

Through the EAP process, colleges assessed their strengths, resources, and gaps and identified opportunities to increase ongoing work in four practice areas. The first practice area consisted of a set of **overarching equity practices**, which included applying equity consciousness, using disaggregated data by race and ethnicity, and examining institutional sorting by race and ethnicity**.** With this foundation, colleges focused on setting goals and implementing strategies in the following areas: **student support and engagement, curriculum design and instruction, and pathways to education and employment**. Below, we describe the strategies implemented and lessons learned in each of these areas.

Student Support and Engagement

Student supports can be critical for overcoming the numerous barriers that students of color face because of structural racism, and these supports can also be important for promoting access and engagement with online content. Key strategies CTE CoLab colleges adopted in this area are (1) building community in online classes by providing opportunities for engagement and connection with peers, (2) connecting students to supports and digital inclusion resources that are responsive to student needs, and (3) developing new programming to support student success.

Lessons learned follow:

- **Increase online students' engagement with their coursework and with one another.** For example, some colleges in the CTE CoLab implemented discussion forums aimed to foster peer-to-peer connection in online courses, which was especially important for courses that were fully asynchronous. Others developed email templates to make it easier for students to contact instructors with questions, when they need extensions, or to voice other needs, acknowledging that some students might not come equipped with the skills or knowledge for taking advantage of the flexibility available to help them balance schoolwork with their complex lives.
- **Build the capacity of CTE program staff to collect and use data to make decisions that are responsive to student needs.** This can help design effective supports and programs for students, especially online learners, tailored to their personal and group experiences, strengths, and needs. By collecting feedback from students, CTE CoLab colleges could identify which supports needed to be bolstered and those that required less attention, providing critical information in the context of scarce resources.
- **Develop new student support programming that promotes digital inclusion and program success.** Colleges worked to make online classes more accessible through access to devices and by training in digital skills. New orientation programs embedded in online course modules provided students with better information on program expectations and resources, while access to mentors helped students navigate the college experience.

Curriculum Design and Instruction

Instructors play an important role in driving equity in online and hybrid CTE programs. Instructors can be intentional about their curricula, instruction, and overall program delivery to ensure their classroom environments and communications foster a sense of belonging, which has been linked to better

outcome for students. The main strategies colleges adopted related to curriculum design and instruction included (1) providing professional development resources and support to faculty, (2) modifying curricula and syllabi to make course content more culturally responsive and engaging for students, and (3) fostering student and instructor digital skill attainment.

Lessons learned follow:

- **Provide professional development that advances instructors' understanding of equity, student needs, and strategies to advance equity.** CTE CoLab colleges made curricular resources available to faculty to ease the transition to online instruction, facilitated discussions on culturally responsive pedagogy, provided access to mentorship opportunities, and provided training on Diversity Equity and Inclusion (DEI) and using data to advance equity. Colleges can encourage participation in professional development activities by supporting faculty with compensation, including release time and paid stipends.
- **Change curricula, course materials, and instruction to increase students' sense of belonging to support engagement and persistence.** For example, CTE CoLab colleges incorporated straightforward language with clearly articulated expectations into syllabi, made curricula more culturally relevant with diverse examples, and provided opportunities for peer-to-peer feedback to improve students' sense of belonging. Program staff reflected that even small interventions at the classroom level can meaningfully advance equity.
- **Support instructors by offering professional development and resources to deliver effective online instruction.** In order to provide an engaging learning experience that builds the skills students need and enables students to overcome obstacles and stay on track, instructors must go beyond just moving course materials online and using Zoom for virtual classes. Access to training around the latest in online teaching strategies, instructional design support, and course shells embedded in the learning management system, are important ways to assist instructors in transforming their courses for the online environment and facilitating student success.

Pathways to Education and Employment

A key outcome of CTE programs is to help students get jobs, which requires career-oriented services and connections to employers. To support students' pathways to education and employment, CTE CoLab colleges implemented the following strategies: providing students with career information,

support, and industry connections; engaging new industry partners aligned with equity goals; and integrating equity work into employer partnerships.

Lessons learned follow:

- **Leverage technology and partnerships to provide career-oriented supports to students in online and hybrid programs.** For example, CTE CoLab colleges embedded career information into student orientation modules, partnered with career services to expand internships, offered online events for students to connect with industry representatives, and paired students with industry mentors. Even for in-person programs, offering these components virtually can improve access for students.
- **Engage employers in efforts to advance equity within programs, colleges, workplaces, and industry.** Employers can be champions with other employers or push for changes within the college or program to meet their own diversity goals. In the CTE CoLab, colleges worked with individual employers, engaged their advisory boards, and worked with industry groups. For example, one college developed a handbook for its advisory board, which included information on equity practices and goals. Others offered training to employer partners. CTE programs could benefit from resources and support to engage in these complex and challenging efforts with employers.
- **Engage new employer partners aligned with equity goals.** Identifying employer partners that reflect the racial and ethnic diversity of the student body is an important step, but there is a need to go beyond increasing diversity of employer partners in efforts to advance equity. For the CTE CoLab colleges, this meant developing relationships with partners that shared equity goals and were interested in working with colleges to effect change. To identify partners, colleges can look for those who (1) are engaged in their own DEI initiatives, (2) are willing to support a program's equity efforts, and (3) have workplaces reflecting inclusive practices.

Overarching Lessons

Through their participation in the CTE CoLab, colleges built their knowledge of equity concepts and strategies, identified gaps, established goals, and made progress toward those goals. Making bigger institutional changes sometimes required starting small, with a committed team bringing diverse expertise and positionalities to advance equity. Challenges included the two-year timeframe of the initiative—which colleges shared made it difficult to adopt large-scale changes to racial equity goals.

Looking ahead, CTE CoLab colleges plan to draw from these lessons to inform deeper and broader implementation of these strategies, including scaling into new programs and across their colleges with an eye toward institution-level change. Other colleges can learn from and build upon these strategies to reduce equity gaps in online and hybrid postsecondary CTE programs across US higher education.

Overview of the CTE CoLab

The Career and Technical Education (CTE) CoLab was launched in fall 2020 in response to the emergency shift to online learning in postsecondary education that happened during the COVID-19 pandemic. Racial disparities in academic and career outcomes have historically existed for students of color in CTE programs, and partnering organizations came together to address concerns that these gaps would widen in the context of remote delivery.

Data from the project's initial landscape scan supported these concerns, showing that students of color fare worse in postsecondary CTE programs, with large gaps in outcomes by race and ethnicity (Anderson et al. 2021). Among students beginning in the same CTE programs in 2011–12, Black and Latinx students had significantly lower GPAs and were significantly less likely than white students to earn a degree or credential and to gain a job related to their program of study six years after program entry. The disparities are larger among students who took at least one course online or were in an online program when they started their CTE program. Across these outcomes, Black students experienced larger gaps relative to white students than did Latinx students. These differences could not be explained by differences in students' preparation for college.

To address these gaps and new challenges that emerged in the shift to online learning, the Urban Institute launched the CTE CoLab, bringing together a coalition of five national organizations to support a college community of practice consisting of 12 community and technical college programs (see box 1). The coalition members supported colleges—through coaching, professional development, technical assistance, and peer learning—to develop and implement Equity Action Plans (EAPs) aimed at effecting program and institutional changes to address equity gaps identified by colleges.

BOX 1

About the CTECoLab and College Community of Practice

CTE CoLab

The CTE CoLab aims to reduce equity gaps for students of color—especially students who are Black, Latinx, or Indigenous—enrolled in credit-bearing online postsecondary CTE programs. Funded by ECMC Foundation, the CTE CoLab is a collaboration led by the Urban Institute in partnership with the following organizations: World Education, a division of JSI, the National Council for Workforce Education, the University of Pittsburgh School of Education,[a] the Instructional Technology Council, the National Coalition of Advanced Technology Centers, and Sandra Grace Consulting LLC. This coalition supports the College Community of Practice—a group of community and technical colleges—to build knowledge, prioritize equity in program goals and delivery, and develop and share resources to improve education and career outcomes in online CTE programming. Learn more at https://ctecolab.org/.

CTE CoLab College Community of Practice Colleges and Programs by Sector

Business and Public Sector

- **CUNY Kingsborough Community College** (New York), criminal justice
- **Nicolet College** (Wisconsin), business management
- **Olive-Harvey College** (Illinois), cannabis education

Information Technology (IT) or Digital Focus

- **Chippewa Valley Technical College** (Wisconsin), IT software developer
- **Diablo Valley College** (California), art digital media
- **Onondaga Community College** (New York), health information technology
- **Wake Technical Community College** (North Carolina), network management

Early Childhood

- **Community College of Aurora** (Colorado), early childhood education
- **Modesto Junior College** (California), child development

Mechanical Technology

- **Fletcher Technical Community College** (Louisiana), machine tool technology
- **Mt. San Jacinto College** (California), water technology
- **WSU Tech** (Kansas), machining technology

[a] The Office of Community College Research and Leadership at the University of Illinois Urbana-Champaign was originally a partner before the partnership transitioned to the University of Pittsburgh School of Education.

The purpose of this report is to document the equity action planning process, goals and strategies adopted by the colleges, and challenges and lessons learned about how to advance racial equity in online and hybrid postsecondary career and technical education. Information from this report is based on documentation submitted by participating colleges, case study interviews with three colleges, and the perspectives of the staff and team members who facilitated the initiative. College case study data collection included semistructured interviews with CTE CoLab program staff, administrators, and instructors at Chippewa Valley Technical College, Diablo Valley College, and WSU Tech. Insights from these interviews are included throughout the report and a profile of each college program is included in the appendix.

The Need to Address Equity Gaps in Online and Hybrid CTE Programs

About four million students are enrolled in for-credit CTE courses at community and technical colleges.[1] These programs are defined by their goal to prepare students for immediate employment. Not only do community and technical colleges enroll a large percentage of students of color, but a large percentage of students of color enrolled in college pursue their education at a community college (Colin et al. 2023). A community college education can offer a lower cost option for students and, depending on the program and field of study, a pathway to a good job.

A variety of data and studies show that students of color, especially those who are Black, Latinx, or Indigenous, face barriers in realizing the benefits of CTE programs. Many of the barriers are because of structural inequalities that stem from a history of exclusion from and unequal access to a quality postsecondary education. These inequities show up in the data, as described above, that consistently show that Black, Latinx, and Indigenous students fare worse than white students (Anderson et al. 2021). With higher rates of poverty and lower incomes on average, these students are more likely to attend a poor-quality school and be underprepared for college, have fewer financial resources to support their education, and have differential access to other kinds of supports (e.g., employment networks, generational wealth, etc.). Community college students who are Black or Latinx are also more likely to be older, to hold a job while pursuing their education, and to be supporting a family of their own. Related structural barriers and a legacy of racism in postsecondary education puts students at a disadvantage and requires institutional, programmatic, and course-level changes to support student success.

The COVID-19 pandemic and corresponding shift to online learning that happened across higher education created additional risks for widening disparities for students of color. Underresourced community colleges without experience in online or hybrid delivery did their best to meet the needs of students amid declining enrollment.[2] CTE programs with a strong hands-on component found the move to fully online instruction challenging, and those already offering online courses and programs saw increased demand. At the same time, CTE programs identified that flexible, online learning options may offer one answer to the challenges of declining enrollment. Helping students of color succeed in partially or fully online CTE coursework also provided the opportunity to make progress toward their overall performance metrics around completion and retention.

CTE CoLab colleges came to the initiative with identified gaps for students of color in their online and hybrid CTE programs, and with goals for closing those gaps. Colleges were motivated by data showing that certain subgroups of students—including students of color—faced challenges in accessing programs and with persistence, completion, and access to jobs. Some data pointed to challenges in creating a sense of belonging for students in the online space, which staff worried would interfere with other program outcomes and worsen outcomes for students of color. Box 2 provides examples of equity gaps colleges aimed to address as part of the initiative.

BOX 2

Problem Statements Colleges Developed Describing the Motivation for Their Work with the CTE CoLab

Lower financial barriers, increase community, and cultivate belonging for students of color. Families of color have a lower average family income locally, and approximately 50 percent of program students receive financial aid. We are working to (1) lower the financial barriers to participation, (2) increase our students' sense of community (as 17 percent of students of color reported being dissatisfied with at least one aspect of the campus climate versus 6 percent of white students), and (3) cultivate a sense of belonging in our asynchronous online [IT software developer] program.

—*Chippewa Valley Technical College*

Address differences in course success by race and ethnicity. The average success rate for African American students in fully online art digital media (ARTDM) courses was 59 percent versus 69 percent across all demographics in fall 2021. We are seeing increasing enrollment in African American, Native American, Hispanic, and Filipino student populations, but course success rates differed by 6 percent in comparison to Asian and white peers (66 percent versus 72 percent, fall 2021). Needs included (1) stronger student support structure in program and (2) data infrastructure and racial equity training to drive equity practices in faculty and administration.

—*Diablo Valley College*

Acclimate students to college and employment expectations, review instructional materials, and seek program involvement from industry representative of the student population. Over a third of enrollment in the program are students of color and local industry for this occupation [machining technology] is less diverse than WSU Tech's program, with only 15 percent of the workforce identifying as African American, Asian, or Hispanic. To provide better support for students, this project needed to (1) build structure that provides students resources to be successful and adjust to college and employment expectations, (2) review instructional materials from an equity lens, and (3) seek involvement from industry members who are representative of our student population as key areas to assist with the transition to college and work.

—*WSU Tech*

Source: Advancing Racial Equity in Hybrid and Online Career and Technical Education (CTE) Programs: Summary of College Action Plans in the CTE CoLab Initiative.

The initiative provided the opportunity to support changes that would meet the needs of students in the immediate term during the height of the COVID-19 pandemic, but also to improve delivery of

online and hybrid learning in the future. Taking an equity focused approach was a way to reduce disparities for students of color while also helping to improve outcomes for students overall.

Equity Action Planning and Implementation

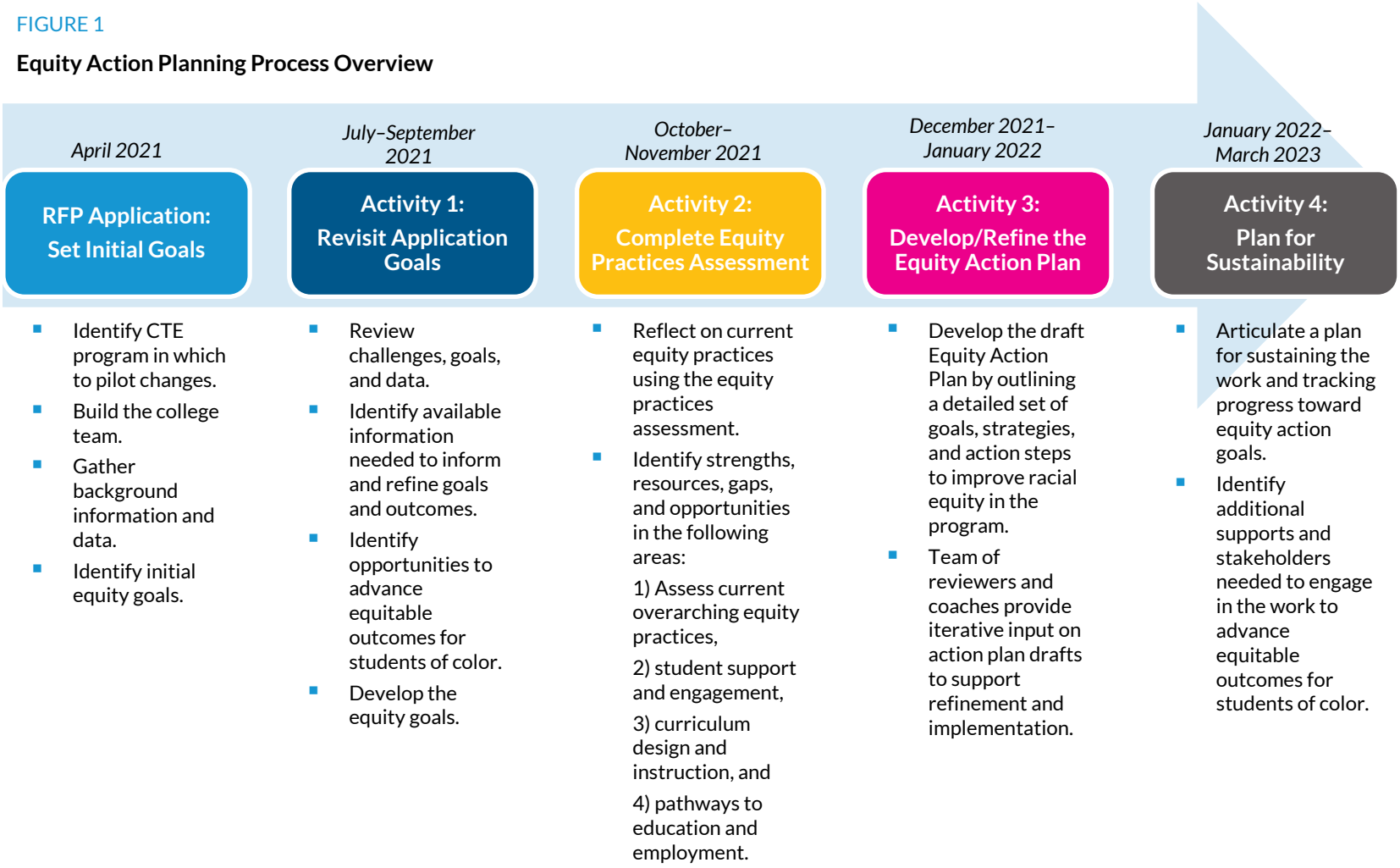
The CTE CoLab was designed to address these challenges through an approach that centered on equity, which meant developing and implementing strategies targeted at students who have been systematically disadvantaged so that they can access high quality opportunities and achieve their desired outcomes (see appendix for key terms).

With the support of the coaching team and other members of the coalition, college team members refined their project goals, conducted a self-assessment (called the equity practices assessment), developed an Equity Action Plan (EAP), and began to implement that plan. Near the end of the initiative, they began to plan for sustainability, which involved identifying how to keep the work moving forward beyond the end of the grant. Figure 1 provides an overview of the EAP process.

Although figure 1 shows a linear process, the colleges continuously refined their goals and strategies based on opportunities that emerged or challenges they encountered along the way.

FIGURE 1

Equity Action Planning Process Overview



Throughout the process, colleges continued to collect student and instructor feedback and implement and refine strategies.

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Equity Action Plan Framework

To guide their work, the equity action planning tool offered a framework for thinking about key dimensions of racial equity at the program level.[3] It was organized along four dimensions, building on the project's initial landscape scan (Anderson et al. 2021), key literature from the field, and insights from experts (including members of the coalition). The first dimension consisted of a set of **overarching equity practices** that were meant to be a foundation for the work (see box 3).

BOX 3

Overarching Equity Practices

Applying equity consciousness. Equity consciousness is the process of recognizing that practices and policies have not been designed to promote equity and require intentional strategies to meet the needs of students of color and improve outcomes (Bensimon 2018; Liera and Dowd 2019; McNair, Bensimon, and Malcom-Piqueux 2020; Zamani-Gallaher 2020). As part of the CTE CoLab, colleges were encouraged to provide opportunities for faculty and staff to develop a better understanding of the concept of equity and to equity consciousness, so that they could think intentionally about equity in the design of strategies to improve outcomes for students of color.

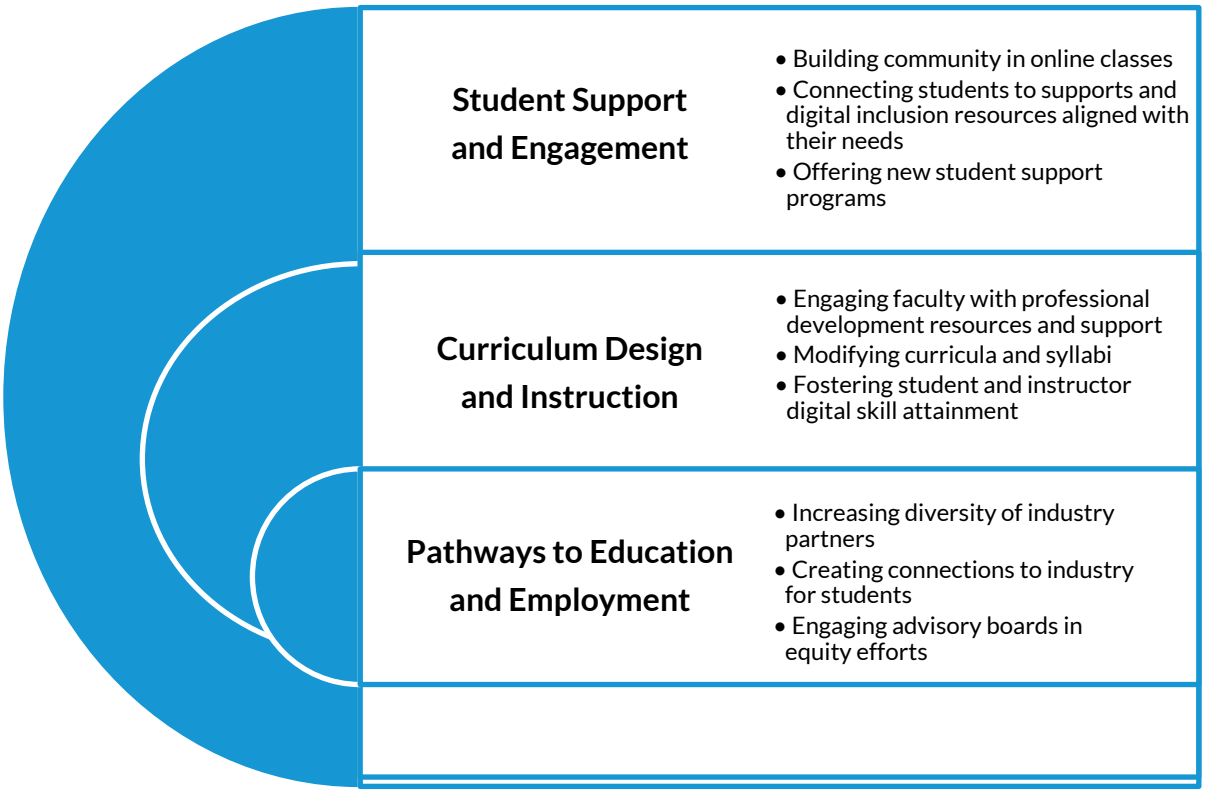
Using data disaggregated by race and ethnicity. To understand equity gaps, set goals, and monitor progress of program and policy changes, colleges were encouraged to routinely disaggregate data on student characteristics and program experiences, with a focus on race and ethnicity. The Urban team collected individual-level administrative data, fielded surveys of faculty and instructors, and supported collected in qualitative data collection from students. Programs participating in the CTE CoLab were encouraged to reflect on these data insights to identify any gaps in student success, and then develop interventions in their action plans to improve equity, with a specific focus on students of color.

Examining institutional sorting. Using data, colleges were encouraged to look at the ways that program processes, such as recruitment and advising, intentionally or unintentionally result in sorting and program segmenting of students. This included how technology, access to computer devices and the internet, and digital skills supports, along with other supports, were deployed or access based on students' race or ethnicity. Because of the CTE CoLab's program-level focus, the issue of institutional sorting was not a strong focus for participating colleges, although several included strategies around access to digital resources.

The remaining dimensions included program-level strategies in the following areas: **student support and engagement, curriculum design and instruction, and pathways to education and employment**. With the support of their coaches, the college teams worked together to assess their programs along these dimensions, which informed the development of their EAPs. Figure 2 describes the goals established by the colleges related to each dimension of the EAP framework.

FIGURE 2

Areas of Focus and Innovation for CTE CoLab Colleges



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The remainder of the report will provide more detail on the goals established, strategies implemented, challenges and lessons learned in the areas of student support and engagement, curriculum design and instruction, and pathways to education and employment.

Student Support and Engagement

Context

Equity-conscious student support and engagement strategies are proactive and intentional, and they respond to the range of students' lived experiences, identities, prior knowledge, and needs. Enhancing instructors' personal awareness and mindfulness of students' needs, their behavior toward students, their course policies, and the (virtual) settings where learning occurs are important precursors to meaningful student support and engagement (Welton, Owens, and Zamani-Gallaher 2018). Facilitating an online community where students feel connected and visible encourages an important sense of belonging. Barriers to a sense of belonging are exacerbated when CTE programs do not offer necessary academic and career-oriented advising supports, and when instruction is not responsive to students' needs. To effectively support students, instructors should be informed about complementary services or programs students may want to access, whether within their institution, such as academic or technology support, or outside of it (Anderson et al. 2021).

What Colleges Did

The practices colleges adopted under this strategy were designed to develop a sense of belonging, assess student needs and respond holistically, and maximize students' strengths and assets. Engagement strategies included revisions to program orientation, career advising and planning, and student engagement in design of programs. Academic and personal support strategies included approaches to determine what supports are needed, directing students to available supportive services including access to devices for digital inclusion, and partnerships with campus services and community supports.

Ten of the twelve CTE CoLab colleges established goals that aimed to support student success and engagement. Goals and strategies colleges implemented fell under the following themes:

- Building community in online classes
- Connecting students to supports and digital inclusion resources aligned with their needs
- Designing new student support programs

Building Community in Online Classes

Through their participation in the CoLab, colleges recognized the importance of community building in an online environment, which can impact whether students are successful in completing a course or become disengaged, affecting retention. Building community online is important for students of color to feel connected to their instructors and to each other, given the legacy of historic exclusion and systemic marginalization in education institutions for these students. A team member from Chippewa Valley Technical College observed, "This issue of belonging is really central to success." To foster community in the online environment, colleges implemented several strategies as part of a commitment to increase student-to-faculty and peer-to-peer engagement, as summarized in box 3.

The students felt that when their voice was heard and somebody was actually listening to them and responding… that turned into, I'll probably offer my opinion or my suggestions again, because somebody's actually listening to me and doing something about it.
—Reflection from the Chippewa Valley Technical College team

BOX 3

Examples of How CTE CoLab Colleges Fostered Student Engagement with Peers and Faculty Online

Portfolio avatars. Chippewa Valley Technical College implemented online portfolio avatars to encourage students to represent themselves in their online community. They offered students the choice to upload their own photo, use a portfolio icon, or leave it blank. The college also used contact assignments where students recorded a video, sent an email, or met with their instructor during or outside office hours.

Early alert software for instructor-to-student engagement - Onondaga Community College created guidelines for faculty on how to use LazerSuccess flags and alerts—an online software tool—to provide direct feedback to students about their course performance. Guidelines on how to use the software were created by the Health Information Technology program faculty to address some of the complexities encountered when hiring professionals as subject matter experts with no or little teaching experience. The college team shared that these guidelines helped ensure consistency among faculty in addressing student concerns and highlighting student success, which faculty found to be very helpful and will continue to inform best practices across the campus community.

Email templates. To encourage and build student confidence to approach instructors proactively, another strategy developed at Diablo Valley College (and subsequently implemented at Chippewa Valley Technical College) was creating email templates that students could use to contact instructors with questions, when they need extensions, or to voice other needs.

Promoting dialogue and connection. Additional strategies CTE CoLab colleges implemented to build community and connection included the following:

- using **discussion forums** on fun topics not related to course content as part of course modules to simulate a social media community
- sharing **video updates** from faculty and staff
- using technology such as **Google Suite** to promote peer engagement and collaboration
- leveraging informal learning opportunities such as casual drop-in **office hours** where multiple students could attend

Connecting Students to Supports and Digital Inclusion Resources Aligned with Their Needs

Many CTE CoLab colleges conducted a review of student administrative data, fielded surveys, and convened focus groups to understand the experiences of students of color in their programs. These data helped instructors and program staff connect students with supports aligned with their needs and

consider program or course changes that might help reduce student barriers to success. As an administrator from WSU Tech described, "Disaggregating data … [involved] getting in the habit of looking at the data and the story it's telling us and looking at what we are doing that is contributing to this [outcome]—what do we need to start, what do we need to stop, what do we need to do differently?" Colleges found that when working with data, building a narrative about what the data mean—and how these insights should inform future decisions—can be fraught. As part of storytelling with data, broader structural barriers and systemic racism faced by students of color (e.g., lack of educational access or labor market discrimination) must be acknowledged, so that the "why" behind observed disparities is explored. It also takes time and resources to collect and thoughtfully integrate student input from surveys and focus groups, and staff, faculty, and students may have limited bandwidth to engage.

Overall, colleges shared that they felt data collection and analysis related to student needs and outcomes helped raise awareness among faculty and helped program administrators implement proactive advising and supports that could deepen students' connections to their programs and institutions and assist with completion.

Colleges implemented several strategies to assess students' needs and used that information to connect students with desired resources and supports. For example, Modesto Junior College shared in their sustainability plan, "Our most significant lesson has been that to best support our students, our practices should be responsive and reflexive to the needs of our students and community. Our students and community let us know that [our current] approach did not work for them. Our ability to pivot … to create an independent learning tool was in direct response to that feedback. Further, we have learned how to better support our instructors to feel confident that they are meeting the needs of our diverse student population as well."

WSU Tech conducted a student focus group both years of the CTE CoLab grant with students in the machining program to better understand their experiences. The focus group questions touched on students' digital literacy, first semester or first year experiences, and suggestions for orientation topics. Students were also asked how they heard about the program, and whether or not they would recommend the program to a friend, among other topics. Focus group insights informed staff about students' awareness of available supports, including financial aid, and led to changes in the development of orientation and advising information for students in the hybrid machining program.

Diablo Valley College asked via a student survey, "How many people do you feel connected to in your class?" They found that some students did not feel connected at all, which made instructors think

about how to create connections in the online space, leading to changes in the course to build connection points among students.

Another way that colleges connected students with resources and supports aligned with their needs was by providing access to physical digital devices, internet connections, and essential software (see box 4).

BOX4

Examples of Digital Inclusion Resources Developed by CTE CoLab Colleges

Learning Management System modules. To introduce students to the Learning Management System and its features prior to the first course, Onondaga Community College's Health Information Technology program created "Learning Module 0." The learning module highlighted the technology students would need for successful course completion and helped instructors understand if students needed additional supports. Mt. San Jacinto College created a customized Canvas module for the Water Technology Program for their students that included information on African American water technology faculty and networking resources for students and professionals in the engineering community, such as the National Society of Black Engineers.

Student Technology Loan Program. To connect students with Chromebooks and wi-fi hotspots, among other technology resources, Diablo Valley College utilized their campus-wide Student Technology Loan Program and an Equipment Checkout Program for the art digital media program and the film television and electronic media program, which gives students access to more high end or specific technology devices used in digital media.

Writing Assistance Software. Community College of Aurora provided students access to Grammarly to further support students in their communications with peers and faculty.

One of the things that I think is really important when you talk about [setting up] an orientation with students is you start building that relationship with students right away. And you ask them for a set of commitments and things like that. Our conversations didn't just talk about career services. We talked about, "What does it look like to put forth a full day of work here and then work a full shift as an adult?" Because we have a bunch of students that do exactly that. They're full-time students and they're full-time employees.
—Reflection from the WSU Tech team

Designing New Student Support Programs

The student feedback CTE CoLab colleges collected during the grant period guided the design of new student support programming, which they piloted during the grant period, including orientation programs, open houses to familiarize students with program options, and mentorship programs. Colleges sought to use an asset-based approach—emphasizing the benefits of students' lived experiences and the inherent strengths they bring to the classroom—to address inequities students highlighted in their feedback. This in contrast to a deficit mindset, which attributes students' lack of success to their lack of preparation for college coursework or other inherent issues.[4] Box 5 provides examples of how colleges designed new programming to support their students as part of the CTE CoLab grant.

BOX 5

Examples of New Student Support Programming Implemented by CTE CoLab Colleges

Orientation. WSU Tech created and launched an orientation that supports students in the Machining Program, and integrated technology skills and resources into the orientation process. At the end of the grant period, Community College of Aurora's online Early Childhood Education Director's Certificate program planned to create a targeted and focused online orientation. The plan included delivering session content on admissions, course resources, including the D2L Brightspace Learning Management System, the graduation process, and transfer to a bachelor's degree program.

Open house. Diablo Valley College held an open house with Mt. Diablo Unified School District that attracted 120 attendees and included workshops, studio tours, a campus tour, and an introduction to the program that helped create connection to the Art Digital Media program and inform prospective students' understanding of certificate and degree pathway requirements, supports, and technology needs prior to enrollment.

Lessons on Student Support and Engagement

Lessons that emerged from the strategies colleges implemented to support student support and engagement included the following:

Increase online students' engagement with their coursework and with one another.

For example, some colleges in the CTE CoLab implemented discussion forums aimed to foster peer-to-peer connection in online courses, which was especially important for courses that were fully asynchronous. Others developed email templates to make it easier for students to contact instructors with questions, when they need extensions, or to voice other needs, acknowledging that some students might not come equipped with the skills or knowledge for taking advantage of the flexibility available to help them balance schoolwork with their complex lives.

Build the capacity of CTE program staff to collect and use data to make decisions that are responsive to student needs.

This can help design effective supports and programs for students, especially online learners, tailored to their personal and group experiences, strengths, and needs. By collecting feedback from students, CTE CoLab colleges were able to identify which supports needed to be bolstered and those that required less attention, providing critical information in the context of scarce resources.

Develop new student support programming that promotes digital inclusion and program success.

Colleges worked to make online classes more accessible through expanded access to devices and by providing training in digital skills. New orientation programs embedded in online course modules provided students with better information on program expectations and resources, while access to mentors helped students navigate the college experience.

Curriculum and Instruction

Context

The COVID-19 pandemic accelerated a shift to online learning already underway in many CTE programs. The move to online modalities created opportunities for those struggling to attend in-person courses while elevating students' challenges in engaging with education through technology that disproportionately affect students of color because of structural racism and systemic inequalities.[5] Online education can promote equity if it is undertaken with the goal of expanding options for high-quality instruction and supporting student success.

Instructors play a critical role in driving equity in online and hybrid CTE programs by being intentional about their curricula, instruction, and overall program delivery to ensure their classroom environments and communications foster a sense of belonging and enable academic success for all students.

What Colleges Did

Colleges implemented strategies designed to (1) improve in-person and online curriculum design; (2) encourage, respect, and incorporate students' diverse lived experience, knowledge, and learning styles; and (3) improve outcomes. This included adopting course design activities that promote equity and supporting digital skill development and learning.

Ten out of the twelve colleges established goals and identified strategies that aimed to advance equity and support student success through curriculum design and delivery. Goals and strategies colleges implemented fell under the following themes:

- Engaging faculty with resources and support for professional development
- Modifying curricula and syallabi
- Fostering student and instructor digital skill attainment

Engaging Faculty with Professional Development Resources and Support

The Urban research team fielded two instructor surveys a year apart to gather insight about faculty knowledge and application of equity and online learning practices, their experience as instructors, and needed support. Survey findings and additional conversations with faculty revealed professional development needs in the following areas: (1) understanding and application of equity practices, (2) understanding digital literacy, (3) designing and delivering online learning, (4) using data to understand student needs, and (5) using data to identify opportunities for early intervention. Half of the colleges participating in the CTE CoLab implemented resources and developed tools to support professional development. The strategies they developed and challenges they encountered along the way are described below.

Several colleges developed asynchronous and synchronous spaces for faculty to exchange ideas. Colleges developed resources and professional development opportunities to support faculty in implementing equity-informed changes to curriculum design and instruction delivery. This was in response to faculty members' requests for resources to support equity-conscious practices in course design and delivery and for opportunities to connect with one another about racial equity issues and instructional design. See box 6 for examples.

BOX 6

Examples of Faculty Professional Development Opportunities Implemented by CTE CoLab Colleges

Curricular resources. Community College of Aurora developed a shared cloud drive with a resource bank for faculty with customizable course materials, curriculum maps, and course assessments, making it easier for faculty to update their courses. Diablo Valley College created a professional development course where faculty met synchronously four times during the semester and completed self-paced or lightly facilitated online asynchronous training modules focused on supporting online racial equity, reviewing and reflecting on program data, showcasing college and program resources to support equitable student success, promoting culturally responsive teaching and learning practices and online curriculum design, and building connection and community among instructors in the program through shared practices. Faculty were paid to participate and complete the modules. Synchronous meetings during the semester were used to connect faculty, reflect on teaching, troubleshoot challenges as a group, and review goals and needs.

Faculty conversations. Olive-Harvey College implemented a program they call "5 Conversations," a series of discussions where they brought faculty together to discuss what culturally responsive pedagogy could looks like in practice. To create buy-in with the faculty and facilitate idea exchange, the team organized small discussions and shared resources such as articles ahead of the meeting. The ongoing conversation approach recognized that faculty had different capacities to engage in culturally

responsive teaching, and professional development in this area needed to be ongoing and scaffolded for those at different levels.

Diversity, Equity, and Inclusion (DEI) training. WSU Tech hosted a diversity, equity, and inclusion training for faculty sponsored by an industry partner focused on establishing an equity lens through which to review the curriculum. The training asked staff to consider the importance of micro messaging and offered tools the college used to review their Innovative Technology for Learning curriculum, a third-party web-based technical curriculum for machining. According to a WSU Tech team member, "a promising strategy that sticks out is identifying appropriate training and development that gives our CTE faculty the tools to be able to see things from a different perspective and lens and how to apply it in the classroom."

Using student insights to inform instructor professional development. Colleges identified faculty engagement with data insights as an important strategy to advance racial equity. For example, Diablo Valley College created a data book to inform instructor and staff professional development that contained completion and success data, enrollment data, course drop data, the instructor survey fielded by the Urban Institute, a student survey administered by faculty, as well as an aggregation of other campus surveys including a racial climate survey. Pulling these data sources together for faculty in the program was described by a staff member as "humbling but also empowering." Six of the twelve CTE CoLab colleges administered student surveys to assess programmatic assets, student challenges in the program, and the need for additional supports (see student supports section of this report for additional detail).

Wake Tech worked closely with the college's DEI Council to collect student insights and develop a Blackboard module to enhance their faculty's ability to recognize when students face nonacademic barriers and their awareness of available support resources. The module includes (1) a prereading survey asking participants about their experience with the topic of DEI, (2) a discussion of equity versus equality, (3) a discussion of nonacademic barriers students experience informed by insights gathered though student surveys and focus groups, and (4) strategies to make syllabus more welcoming and how to center equity practices in assignments. The team plans to develop additional sessions focused on addressing other barriers, such as time management, surfaced by the student survey.

An overarching challenge the colleges identified related to faculty engagement with professional development was not having the time and availability to implement changes, especially in the case of adjunct faculty. These efforts compete with other initiatives and often lose in the face of priorities such as the roll out of new processes, systems, and platforms. All these impose various demands on faculty and increase resistance to change, especially for adjunct faculty constrained by limited time and compensation structures, derailing equity efforts.

Several colleges acknowledged the importance of compensating faculty for participating in professional development and were working on finding and allocating funding to encourage more faculty to participate in training sessions.

Some of these professional development sessions focused on improving instruction. CUNY Kingsborough Community College began observing online courses and assessing them based on an online teaching rubric. Mt. San Jacinto College developed a tiered, asynchronous professional development course that models best practices for online learning, and Chippewa Valley Technical College provides access to an education technology team where instructors can receive support.

Modifying Curricula and Syllabi

In addition to faculty professional development support, colleges believed that small changes to curricula and syllabi oriented toward cultural responsiveness and increasing student-faculty engagement could reap benefits for students. Through participation in related equity initiatives and through their work as part of the CTE CoLab grant, colleges have started reviewing course content, materials, and class activities to identify opportunities to increase cultural relevancy.

One method some colleges implemented to enhance learner engagement and empowerment was embedding equity practices into syllabi, including s setting clear expectations for students and conveying a welcoming environment. Other colleges focused their efforts on reviewing course materials for racial representation in visuals and providing diverse examples students could relate to. These strategies are opportunities for faculty to integrate subtle changes where they might otherwise have previously felt they had little control over the format, structure, and content of course materials. Box 7 provides examples of how colleges modified curricula and syllabi in this way.

People were way more willing to complete professional development [training] and to really and earnestly adopt equity practices when they felt that they were being validated and that their labor was being validated through compensation.
—Reflection from the Diablo Valley College team

BOX 7

Examples of Culturally Responsive Curricula and Adapting Syllabi to be Equity-Conscious

Engaging community stakeholders in program design. Nicolet College engaged in a redesign of their Tribal Business Management program. As part of this process, they engaged tribal elders and employers to develop course competencies that bridge expectations of employers with the deeper needs of the tribal communities. Building on this experience, the college is now focusing on redesigning existing courses to embed cultural competency and then layering in the use of hybrid and online learning instructional techniques. Nicolet College also engaged in an equity conscious and cultural appropriateness curriculum review. They began this review when they realized that many individual instructors had been adapting the curriculum to students' cultural contexts, but that the formal curriculum did not reflect cultural sensitivity.

Student-centered syllabi and curricula. CUNY Kingsborough Community College involved students in the redesign of two syllabi as part of introductory course activities. The redesigned syllabi incorporated the students' perspective and included tips for a successful semester and resource lists. Based on results from surveys, Diablo Valley College identified that students found "instructor feedback, flexibility, hands on help, equipment, loans, time to demo the equipment, instructor videos, and peer-to-peer feedback … were very positive experiences." Modifying curricula to incorporate these types of activities can help make course content more culturally responsive and increase student to faculty engagement.

Resources for English language learners. Modesto Junior College developed support materials for students who are English language learners and embedded them throughout their gateway Child Development course. These resources helped students understand how to use their textbook and engage in learning activities.

It can be difficult to assess student levels of engagement in the online environment without in-person observation between instructors and students. Polls, open-ended questions, engaging in chat, student-engagement software platforms, and using breakout rooms are all ways to check if students are engaged, even if they do not have their video cameras on. Colleges also modified their curricula to provide more opportunities to give students feedback, to address the challenge of how to sustain engagement with students through online and hybrid course activities. For example, Diablo Valley College decided to emphasize peer-to-peer feedback on assignments and coursework. Though it was a small sample size, the Diablo Valley College student survey revealed that those students who identified as African American noted that peer feedback was significant and group work was a helpful and positive part of their course experience. This type of student collaboration through group structured, scaffolded

project-based learning can also be done both synchronously and asynchronously. Chippewa Valley Technical College embedded at least one activity requiring peer interaction in every course; previously, there were no requirements for students to interact with one another in the asynchronous classes.

Fostering Student and Instructor Digital Skill Attainment

College staff also described how it is important to not only provide access to course equipment, internet, and broadband connectivity for effective online and hybrid learning, but to ensure that digital skill development is a central focus of the student learning and instructor teaching experience. In looking at options to provide students with the necessary software and encountering challenges with identifying the skills and platforms needed to be successful in their program, Chippewa Valley Technical College decided to review their courses and update stated course objectives related to digital competencies. One example of something that was up for discussion was whether students needed to install software on their computers given that in today's workplace, organizations provide employees with computers already set up. The college found that revisiting these competencies opened new possibilities in terms of what solutions and support were feasible and needed.

Both students and faculty identified the lack of time to learn new platforms and software prior to having to use it in course delivery and assignments as a challenge for effective learning and teaching. To address this challenge, Modesto Junior College embedded digital skills tutorials through the gateway online course to provide students with just in time support with using learning management features (LMS) or accessing course materials. This approach led to increased student engagement with the course. Instructors at other colleges also shared that they could spend a lot of time troubleshooting issues for students. On a positive note, instructors found that helping students troubleshoot deepened their own understanding of technology and honed their digital skills.

We created parallel assignments [demonstrating] how you do something in the graphical user interface…Our students who have absolutely no background don't feel [like] they are being punished for that lack of knowledge. They are learning the vocabulary and ways to apply those techniques that seem very simple to someone with more digital literacy.
—Reflection from the Chippewa Valley Technical College team

Lessons on Curriculum and Instruction

While online and hybrid education presents many opportunities, the implementation of such programs is not always smooth and requires a shift in how instructors deliver and design learning opportunities for students. This type of course redesign can also require increased staff time and resources. Lessons that emerged include the following:

Provide professional development that advances instructors' understanding of equity, student needs, and strategies to advance equity.

CTE CoLab colleges made curricular resources available to faculty to ease the transition to online instruction, facilitated discussions on culturally responsive pedagogy, provided access to mentorship opportunities, and provided training on Diversity Equity and Inclusion (DEI) and using data to advance equity. Colleges can encourage participation in professional development activities by supporting faculty with compensation, including release time and paid stipends.

Change curricula, course materials, and instruction to increase students' sense of belonging to support engagement and persistence.

For example, CTE CoLab colleges incorporated straightforward language with clearly articulated expectations into syllabi, made curricula more culturally relevant with diverse examples, and provided opportunities for peer-to-peer feedback to improve students' sense of belonging. Program staff reflected that even small interventions at the classroom level can meaningfully advance equity.

Support instructors by offering professional development and resources to deliver effective online instruction.

To provide an engaging learning experience that builds the skills students need and enables students to overcome obstacles and stay on track, instructors must go beyond just moving course materials online and using Zoom for virtual classes. Access to training around the latest in online teaching strategies, instructional design support, and course shells embedded in the learning management system, are important ways to assist instructors in transforming their courses for the online environment and facilitating student success.

Pathways to Education and Employment

Context

Career and technical education programming does not end with classroom learning, whether in person or in the virtual environment. Students enroll in CTE programs because they want the skills and credentials needed for jobs. An area of emerging knowledge is how to take an equity-conscious approach to supporting students in navigating decision making and progress toward and along a career, including decisions about what to study, what courses to take and help in enrolling in further education or getting a job when a program nears completion. Another question is how to engage employers—key partners in CTE programs—in efforts to advance racial equity.

Use of data is key in understanding and measuring career pathway progress. Programs can collect and use information on students' postprogram employment outcomes to measure effectiveness in preparing people for jobs that are in demand and to inform program improvements.[6] By disaggregating data by race and ethnicity, programs can gauge how students of color are faring relative to other students after they leave the program. This information can be used in advising new students on career options and informing work with employer partners.

What Colleges Did

The practices colleges adopted under pathways to education and employment were designed to promote equitable career pathways by engaging advisory board members and industry partners in the work of addressing racial equity gaps in recruitment and hiring, identifying racially diverse industry role models, and expanding opportunities for relevant work-based and applied learning.

Five colleges included goals in this area, focusing primarily on partnerships with industry, as follows:

- Providing career information, support and connections
- Engaging new industry partners aligned with equity goals
- Integrating equity work into employer partnerships

Providing Career Information, Support, and Connections

Four colleges did work to provide career planning and navigation supports to students and connect them to industry. The work to develop course orientations for students can also be an opportunity to provide information on jobs, careers, and employers. This can include information on what students need to know, what they can expect from a job in the industry, and what skills and experience they will need to get a job. Career navigation support can be provided by faculty, student, or career services offices or by industry mentors. Several CTE CoLab colleges explored mentorship as a potential strategy. Work-based learning opportunities—in the form of internships or field experiences—provide another way to explore occupations, build skills, and connect with industry. Box 8 describes the ways that colleges provided career information, support, and connections.

Expanding connections to industry and supporting career transitions can involve partnerships with organizations other than employers themselves. Olive-Harvey College had the goal of increasing partnerships with leading industry associations as a way of increasing hiring for students of color. This included creating "Community-Based Agreements" to secure job placements for participants with different organizations. To support transitions to jobs, Olive-Harvey College also worked with Cabrini Green Legal Aid to make sure that criminal records and background checks were not acting as a barrier to employment for graduates from their Cannabis Education program.

BOX 8

Examples of College Strategies to Provide Career Information, Support, and Connections

Embedding career information in the student orientation module. The Canvas module Mt. San Jacinto College developed to orient students to the Water Technology program includes information on career opportunities and about educational programs at four-year schools for those who want to continue their education.

Partnering with career services to expand internships. Mt. San Jacinto College also enhanced its collaboration with the career services office as part of the CTE CoLab with a goal of ensuring that African American students were aware of internship opportunities in the field.

Offering online events for students to connect with industry representatives. Chippewa Valley Technical College is working on a plan to offer online events that will give students the chance to meet virtually with industry partners to improve job prospects and expand networks.

Pairing students with industry mentors. WSU Tech developed a mentorship program where students could be paired with industry representatives. The idea was to support the academic and career success of students while also raising awareness among industry partners.

Engaging New Industry Partners Aligned with Equity Goals

In creating its new mentoring program, WSU Tech sought to increase the diversity of its employer partners by expanding partnerships with machining business owners, executives, and managers that reflect the racial diversity of students served by the programs. This was about students seeing themselves represented in the industry and also identifying workplaces that might be more supportive of students of color. Staff found it challenging recruiting mentors, especially those that that reflected the makeup of those enrolled in the program. The college is exploring other ways to encourage higher participation among industry partners in future iterations of the mentorship program.

Fletcher Technical Community College developed a plan to increase the diversity of its Machine Tool Program Advisory Committee to better align with the demographic characteristics of students served in the program. Originally, they expected to focus their activities in the grant on increasing the diversity of students in the program, but in examining the data disaggregated by race and ethnicity, they realized that the student body was diverse, but what was lacking was diversity of employer partners and the employer advisory committee. In addition to reflecting racial diversity that matched their student body, Fletcher Technical Community College wanted to better understand whether employers were engaged in equity initiatives within their own companies with the idea that such employers might

be supportive of the program's equity efforts and that their companies might be welcoming to graduates of color.

Engaging employers can be challenging in any program because employers are busy. Increasing the diversity of industry partners can be particularly difficult, especially in sectors where most workers are white, for example in the information technology sector.

Integrating Equity into Employer Partnerships

Beyond expanding employer partners in alignment with equity goals, some colleges worked to more directly engage employers around equity issues and goals. As a staff member for WSU Tech put it,

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Industry, especially manufacturing, is more in tune with Diversity, Equity, and Inclusion right now but the more we can open these conversations specifically about equity [the better] … I think a company could potentially be reflective on policies [leading to] change.

Two colleges worked closely with their employer advisory boards as part of the CTE CoLab, aiming to help change industry practices and support for students through those employer partnerships. Fletcher Technical Community College sought to revamp the Machine Tool Program Advisory Committee, made up of local employer partners, to put a stronger focus on DEI. This included developing a handbook for committee members that addressed related issues. The college hired a consultant to develop this resource, which establishes the purpose, guidelines, and best practices for program advisory committees. In addition to discussing how to diversify the advisory committee, the handbook includes a member agreement to be signed annually by advisory board members. The handbook provides a framework for thinking about the diversity of the committee as well as providing guidance on topics such as how to have effective conversations about DEI and "sentence starters" for difficult conversations to give members tools for talking about issues of race. Staff noted the challenge of communicating the plan to industry partners and getting faculty buy-in (see box 9).

Olive-Harvey College also worked closely with its advisory committee along with other community and industry partners. A big focus was on educating advisory board members about the population served by the program, who were individuals with cannabis conviction histories. As the Olive Harvey

College noted in its description of the problem, "Blacks were 7.5 to 8.5 times more likely than whites to be arrested for having cannabis. The program aims to address the racial inequities created by the war on drugs by offering training specific to the Illinois cannabis industry, along with offering wellness support, financial support, and certifications that prepare them for the industry." As part of this work, it was important to educate employers. At Olive-Harvey College, this was about helping partners better understand the student population to overcome potential stigma associated with their criminal histories. At Fletcher Technical Community College, this consisted of an orientation for new advisory board members.

Employer partners have not yet taken advantage of Olive-Harvey College's training as of the end of the grant period, which is emblematic of the well-documented challenge of engaging businesses in workforce programs (Spaulding and Martin-Caughey 2015). As several colleges noted in a session on employer engagement, it is sometimes necessary to focus on choosing employer partners that are aligned with your equity goals, rather than trying to change the practices of those who are not willing to make changes.

BOX 9

How Fletcher Community College Sought to Advance Equity through Its Advisory Committee

"We initially intended to recruit and retain more students of color in our Machine Tool Technology Program. After reviewing relevant data, we realized we are doing a good job with this. Through discussions with our team leads and other colleges participating in this project, we realized that members of our program advisory committee do not currently reflect the diversity of our students.

"Our program advisory committee had no members of color despite the program student demographics being 50 percent White, 30 percent Black, and 10 percent Hispanic (Spring, 2021). We were also unsure if our members' organizations were participating in DEI initiatives. With a more diverse program advisory committee, our students and faculty will have access to program advisory committee members and potential mentors with similar backgrounds and experiences.

"While it has at times been difficult to have conversations about areas our college and business partners need to address related to DEI, we believe these discussions are necessary and will be to the benefit of our students. Fletcher is composed of individuals from different races, ethnicities, nationalities, socioeconomic statuses, religious backgrounds, genders, gender identities and expressions, and sexual orientations. Fletcher is committed to providing an environment that is inclusive for all."

Source: Excerpted from Fletcher Technical Community College's Action Plan Summary. For more information, see Advancing Racial Equity in Hybrid and Online Career and Technical Education (CTE) Programs: Summary of College Action Plans in the CTE CoLab Initiative.

Lessons on Supporting Pathways

In conversations with colleges, advancing equity within employer partnerships can be the most challenging among the dimensions of the EAP framework. This is because what employers do is out of the direct control of colleges and college staff, and sustained engagement with employer partners is time intensive. At the same time, this work is critical; it is important to think about the role of employers because employers are uniquely positioned to influence policy, the labor market, wages and benefits, workforce providers, workers and employees, and other employers.[7]

Leverage technology and partnerships to provide career-oriented supports to students in online and hybrid programs.

For example, CTE CoLab colleges embedded career information into student orientation modules, partnered with career services to expand internships, offered online events for students to connect with industry representatives, and paired students with industry mentors. Even for in-person programs, offering these components virtually can improve access for students.

Engage employers in efforts to advance equity within programs, colleges, workplaces, and industry.

Employers can be champions with other employers or push for changes within the college or program to meet their own diversity goals. In the CTE CoLab, colleges worked with individual employers, engaged their advisory boards, and worked with industry groups. For example, one college developed a handbook for its advisory board, which included information on equity practices and goals. Others offered training to employer partners. CTE programs could benefit from resources and support to engage in these complex and challenging efforts with employers.

Engage new employer partners aligned with equity goals.

Identifying employer partners that reflect the racial and ethnic diversity of the student body is an important step, but there is a need to go beyond increasing diversity of employer partners in efforts to advance equity. For the CTE CoLab colleges, this meant developing relationships with partners that shared equity goals and were interested in working with colleges to effect change. To identify partners, colleges can look for those who (1) are engaged in their own DEI initiatives, (2) are willing to support a program's equity efforts, and (3) have workplaces reflecting inclusive practices.

Overall Reflections and Next Steps

As part of the CTE CoLab, colleges built their knowledge of equity concepts and strategies, identified gaps, established goals, and made progress toward those goals. The short timeframe of the initiative meant colleges had to set goals achievable within two years. Some strategies also required more time to implement, and colleges reflected on being at the beginning of their efforts when the initiative ended.

Looking ahead, colleges reported plans to continue implementing strategies they adopted in their equity action plans and measure their progress toward goals. Some indicated they would focus on strategies that they did not get to during the initiative. At least half of the colleges planned on expanding and scaling promising strategies to new courses, programs, and divisions of their colleges, or institutionalizing promising practices in other ways. To make bigger institutional changes, colleges realized it sometimes requires starting small with a committed team that brings diverse expertise and positionalities to advance equity.

The purpose of this report has been to provide community college administrators, faculty and staff, as well as others engaged in this work, with insights to guide adoption of strategies that can advance racial equity in CTE programs delivered fully or partially online. Further implementation of these strategies and documentation of these efforts will continue to build the field's knowledge at the intersection of CTE, online and hybrid programs, and racial equity so that in the future all students can access high-quality CTE and good jobs and careers.

Appendix A. Glossary

Key Terms

- **Career and technical education** refers to for-credit, postsecondary career and technical education programs offered at public community and technical colleges.

Equity Concepts

- **Culturally responsive teaching** involves conscious awareness that culture is at the heart of education—in curriculum, instruction, administration, or performance assessment (Gay 2018).
- **Equity** is the fair treatment, access, opportunity, and advancement of all people, while simultaneously striving to identify and eliminate barriers that prevent the full participation of some groups. The principle of equity acknowledges that there are historically underserved and underrepresented populations and that fairness in these unbalanced conditions is necessary to provide equal opportunities to all groups.[8]
- **Equity consciousness** is the process of recognizing that practices and policies have not been designed to promote equity and that intentional strategies are required to meet the needs of students of color and improve outcomes (Bensimon 2018; Liera and Dowd 2019; McNair, Bensimon, and Malcom-Piqueux 2020; Zamani-Gallaher 2020).
- **Institutional, systemic, or structural barriers** are obstacles that collectively affect a group disproportionately and perpetuate or maintain stark disparities in outcomes. These obstacles can be policies, practices, and other norms that favor an advantaged group while systematically disadvantaging a marginalized group (Simms et al. 2015).
- **Structural racism** refers to the historical and contemporary policies, practices, and norms that create and maintain white supremacy.[9] Structural racism continues to disproportionately segregate communities of color from access to opportunity and upward mobility by making it more difficult for people of color to secure quality education, jobs, housing, healthcare, and equal treatment in the criminal justice system.

Online Education Concepts

- **Hybrid or blended** instructional approaches combine online and face-to-face courses.
- **Online education** is a learning environment in which technology facilitates interactions between teachers and students who are separated by time or space. It ranges hybrid or blended instructional approaches to fully online courses and programs. In this report, we treat the terms "online education," "online learning," and "distance education" as interchangeable.
- An **online course** is a course that is taught virtually. Online course-taking can mean completing one fully online course during a semester or participating in a fully online program.
- An **online program** is a program of study in which all courses are taught virtually.

Appendix B. Case Study College Program Profiles

Chippewa Valley Technical College

Information Technology-Software Developer Program

Program description and industry demand:

- **Location:** Eau Claire, Wisconsin
  - » Eau Claire is relatively rural and surrounding areas are more rural.
- **About the program:** Prepares students to become software development professionals, including application developers, web developers, and database administrators.
- **Program length:** The typical program is two years long. Chippewa Valley Technical College has also developed a software developer specialist pathway for students already in the IT software developer field that is less than two years and requires 15 credits.
- **Program format:** The program can be completed in a hybrid format or in a fully asynchronous, online format. In 2018, the Technology-Software Developer Program started its first hybrid cohort. The hybrid components evolved into a bigger part of the program when COVID-19 hit, and they have continued to grow.
- **Core coursework:** Web 1-HTML & CSS, Intro to Computers & Programming, Database 1, Database 2, Programming Fundamentals, Object Oriented Programming, Web 2- Client Side, Java Web Programming, NET Application Development
- **Local labor market/industry demand in this field:** There were 86 regional job openings, with 41 graduates placed in the field this past year.

Equity goals identified through the CTE CoLab Initiative:

- **Problem statement:** Families of color have a lower average family income locally, and approximately 50 percent of program students receive financial aid. Chippewa Valley Technical College is working to (1) lower the financial barriers to participation, (2) increase students' sense of community as 17 percent of students of color reported being dissatisfied with at least one aspect of the campus climate versus 6 percent of white students, and (3) cultivate a sense of belonging in the asynchronous online program.

- **Program goals through the CTE CoLab initiative for improving inequitable outcomes for students of color:**
  - » Remove technology barriers preventing racially and ethnically diverse students from enrolling and progressing in the online IT Software Developer program.
  - » Promote student interactions with peers, faculty, and industry partners to improve community and highlight diversity.
  - » Improve support for students' personal obligations in courses.
- **New resources, tools, or strategies the college has developed because of participation in the CTE CoLab initiative:**
  - » College-wide:
    - Promoted low-cost options to purchase necessary computers. Chippewa Valley Technical College surveyed students, updated their program technology requirements, and contacted a local business to provide discounts to their program (and later, the entire college's) students. The college promoted this information with advisors and others working with potential students.
    - Documented and promoted technology lending options. Chippewa Valley Technical College evaluated library lending and virtual computer options for their program suitability. The college is promoting library options as a short-term support option and is piloting virtual computers in multiple classes.
    - Gathered every department to see their disaggregated data and information and talk about issues.
    - Focused professional development on the equity topics and goals that were started as a part of the CTE CoLab.
  - » Program level:
    - Began surveying students once a week on nonacademic subjects on a weekly basis. The students received a grade for completing the survey. Students felt more connected to the program as a result and instructors could connect with students that disclosed information about other obligations.
    - Created a standard program level course that describes program-wide information as well as the types of supports or services available to students experiencing issues with housing, food insecurity, and mental health. This support includes mental health support, emergency funds, scholarships, and more. The college tried to incorporate this

information into the start of the semester classes as well. Chippewa Valley Technical College saw an increase in students from the program using the available resources.

- Embedded digital literacy skills into the introductory course. Each week's material covers fundamental literacy skills ranging from computer components and their uses to searching effectively online. These literacy skills are connected to other course learning objectives and materials.
- Embedded communication activities to promote a sense of community and belonging. These include instructor contact activities, communication templates, and peer interaction activities. Student feedback has been positive.
- Included information on bias and its relevance to our students as future professionals in multiple classes.

One thing we were able to achieve program wide is the incorporation of some sort of peer activity in every class … previously not all [asynchronous] classes had a requirement that students interact with each other in some capacity.
— Chippewa Valley Technical College staff interview

Student composition, learning needs, and challenges:

- **Number of students served:** 169 students enrolled in the spring 2023 semester
- **Race and ethnicity:** The students in the program are predominantly white and male. About 89 percent of the students in the program are white
- **Average age of students:** The average of students is 27
- **Student Learning Needs and Challenges:**
  - **Technology:** Students do not have access to high-speed internet or having a computer that's capable of using internet to watch videos, submit videos, or run course software.
  - **Sense of belonging:**
    - It is harder to create a sense of belonging for students in a hybrid or purely online format.

- Some students did not have the technological background or digital literacy of working with computers in the past so there was a learning curve. Meanwhile, other students had taken advanced classes in high school or prior programming classes and felt more prepared. Having both types of students in the same classes caused a lesser sense of belonging for students.

Program adaptations made in response to challenges:

- **Survey students**: Students take a weekly survey that asks them about nonacademic things. Additionally, an open-ended question on the student weekly survey was added to ask students, "Is there anything else you would like us to know?"
- **Encourage engagement with peers and faculty:**
  - » Created contact assignments where students either record a video, send an e-mail or they meet with an instructor during student hours or outside of student hours.
  - » Each student was asked to create an avatar for themselves. It doesn't have to be an actual picture of themselves just something that represents them.
  - » Implemented a Q&A per module.
- Use data to look at retention numbers and use of student support services:
  - » In addition to retention numbers, they are measuring how many students use student support services to see if the practices to increase student support uptake have worked.

Diablo Valley College

Art Digital Media (ARTDM) Program

Program Description and Industry Demand:

- **Location:** Pleasant Hill, California
- **About the program:** Prepares students for creative careers in website design, user experience/user interface (UX/UI) design, game design, video production, 3D animation, visual effects, and virtual production.
- **Program length:** Dependent on degree or certificate attainment. The typical Associate of Arts program takes a minimum of two years. Some certificates are available—for example, the certificate of achievement in digital media—which students can complete in one year.

- **Program format:** 68 percent of coursework is offered in a hybrid format, or fully online. Approximately 30 percent of coursework is taking place face-to-face. ARTDM is also considering piloting High Flex learning models.
- **Core coursework:** The primary core course is *Digital Media 105: Intro to Digital Imaging*. Students can specialize their schedules to take other classes based on their interests.
- **Local labor market/industry demand in this field:** Diablo Valley College is trying to prepare students for this new ever-changing market where they are going to be required to constantly shift and evolve based on new emerging technologies. Staff interviewed described how, "the new labor market for art digital media and production is being created right now."

Equity goals identified through the CTE CoLab Initiative:

- **Problem statement:**
  - » The average success rate for African American students in fully online ARTDM courses was 59 percent versus 69 percent across all demographics in Fall 2021. Increasing enrollment in African American, Native-American, Hispanic, and Filipino student population, but course success rates differed by 6 percent in comparison to Asian and White peers (66 percent versus 72 percent, fall 2021). Needs included (1) stronger student support structure in program and (2) data infrastructure and racial equity training to drive equity practices in faculty and administration.
- **Program goals through the CTE CoLab initiative for improving inequitable outcomes for students of color:**
  - » Build a foundation of student support to increase outreach, enrollment, and connection to faculty and program.
  - » Establish department infrastructure and training to center racial equity.
  - » New resources, tools or strategies the college has developed as a result of participation in the CTE CoLab initiative:
  - » Created a full semester training course on "Building Racial Equity"
  - » Ten instructors from ARTDM and FTVE took the course.
  - » Surveys noted that training provided strong resources for connecting to equity principles, practices, and resources, and offered significant opportunities to reflect on equity goals.
  - » Expanded, centralized, and promoted Instructor Resource Hub
  - » ARTDM and FTVE Hub includes departmental information, program resources, student resources, student lab hours, and opportunities for curriculum sharing.

- Created an equity data book benchmarking success rates across modality
- Data disaggregated by demographics
- Collected survey data across equity initiatives
- Included student survey data from Spring 2022

Particularly, African American students experience lower success rates in these classes and in the ARTDM programs … and those [success rates] can be exacerbated by [the online learning] modality. Program faculty and staff wanted to understand what was happening and what would address those gaps. In the past, we have known that those disparities exist, but we didn't have the numbers [to document that the gaps exist] and just talked generally about it before.
—Diablo Valley College staff interview

Student composition, learning needs, and challenges:

- **Student composition and demographic makeup:**
  - **Number of students served:** Spring 2022 Enrollment: 673 students; Spring 2023 enrollment: 832 students
  - **Race and ethnicity:** As of summer 2023, African American enrollment in ARTDM is about 5.8 percent of the total enrollment for the program, whereas African American enrollment at the college is about 4.8 percent. Hispanic students make up about 31 percent of the ARTDM program compared to 27 percent at the college.
  - **Average age of students:** Most students are in the 18- through 25-year-old range, with some older students who have come back to school after working
- **Student learning needs and challenges:**
  - **Adequate technology for success:** Laptops, hotspots, and adequate software to run programs needed to classes and projects. Diablo Valley College found through student surveys that most students had their own devices, but 30 percent of students indicated they didn't have access to the technology software or the ability to upgrade to that software on their own devices.

- **Flexibility with timelines:** Students have other obligations like working that they had to work around, and timing of project assignments proved challenging for some.
- **Better understanding of degree and certificate pathways:** Consensus from student surveys that students did not have an adequate understanding of how to move through the program: what classes to take when, timelines, how to graduate on time, and what students should be taking to pursue a certain field.
- **Time to learn the software:** A lot of the software that the students have to use for classes and projects were not familiar to them before they began the ARTDM program.
- **Communication**: Connecting to instructors in online settings can be a challenge, as well as providing clarity of project criteria in an online setting. Many students felt connected to the program, but about 12 percent of people who responded to a student survey felt neutral or disagreed when reflecting on their connection to the program.

Program adaptations made in response to challenges:

- **Adequate technology for success:** The program provided access to open labs on campus with adequate software that students can use and laptop loans. Diablo Valley College also provided hotspots and other technology supports as well.
- **Flexibility with timelines:** Diablo Valley College started an instructor training, which was like a semester long asynchronous class. The staff working on the CTE CoLab grant provided training on things like how to create flexibility in your class,
- **Better understanding of degree and certificate pathways:** The ARTDM program is currently building a student orientation with a module on certificate and degree pathways to help students better navigate them. Staff have also had to revise some of the certificates and degrees to align them with industry needs and prepare students for work.
- **Time to learn the software:** Program staff started sharing both qualitative and quantitative student feedback with ARTDM instructors, which resonated with them. The data shared with instructors helped them try to be more strategic about making sure students knew about how to troubleshoot software.
- **Communication:** The instructor training also described tips about how to offer student outreach, and how to reach out to students and offer support if a student had fallen behind. The program also used group work and peer-to-peer feedback to help foster connection among students.

- **Other:** The ARTDM department chair worked to centralize communication via a learning management hub for the instructors about what resources were available, times for open labs, and type of equipment that could be borrowed. This helped take up less of instructors' time because the information was now in one place.

A lot of classes are taught online by adjunct professors in our program. So, building community within the program has been a goal, so that we can all understand what resources are available, but also take time to really strategize best practices for our specific area because we are teaching online, but we're also teaching courses that require quite a bit of lab and are more hands on.
—Diablo Valley College staff interview

WSU Tech

Machining Technology Program

Program description and industry demand:

- **Location:** Wichita, Kansas
- **About the program:** Provides students the skills and knowledge needed in various manufacturing procedures and operations, including lathe and mill operations and manual and Computer Numerical Control (CNC) machining operations utilizing similar machines students will encounter on the job.
- **Program length:** Dependent on degree or certificate attainment. There are four stacked exit points that align with entry-level careers in the machining industry. Students earn WSU Tech Technical Certificates or an Associate of Applied Science Degree at each exit point along with a number of industry-recognized third-party credentials.
- **Program format:** Most of the machining classes are offered in a hybrid or online setting. For hybrid classes, students come into the lab in-person for half a day four days a week, Monday-Thursday, with the option to come in on Fridays. The online portion of the hybrid program is done independently on their computers when they have time.

- **Core coursework:** Safety/OSHA 10, Print Reading, Quality Control and Inspection, Metallurgy, CNC Lathe, CNC Operations, CNC Controllers, CNC Milling 1, Composition 1, and Computer Applications.
- **Local labor market/industry demand in this field:** Right now, the program cannot produce enough machining professionals. There are currently 474 jobs available for CNC operators in the immediate and surrounding counties. The program has 120 graduates per year and is the second largest machining program in the country.[10]

Equity goals identified through the CTE CoLab Initiative:

- **Problem statement:**
  - » Over a third of enrollment in the program are students of color and local industry for this occupation is less diverse than WSU Tech's program, with only 15 percent of the workforce identifying as African American, Asian, or Hispanic.
- **To provide better support for students, this project focused on the following:**
  - » Building structure that provides students resources to be successful and adjust to college and employment expectations
  - » Reviewing instructional materials from an equity lens
  - » Seeking involvement from industry members who are representative of the student population as key areas to assist with the transition to college and work.
- **Program goals through the CTE CoLab initiative for improving inequitable outcomes for students of color:**
  - » Explore curriculum and instruction through the lens of racial equity.
  - » Build a strong network of student support with a foundation in equity.
  - » Include industry partners in the discussion of what is important for racial equity, creating a two-way conversation.
  - » Mentoring for students and students of color throughout their time at WSU Tech to get a better understanding of what industry expectations, what college is like, and how to be successful at college.
- **New resources, tools, or strategies the college has developed as a result of participation in the CTE CoLab initiative:**

- » Integrated fundamental digital literacy skills into an introductory course and will be evaluating results.
- » Used data to pinpoint inequities impacting retention and completion segmented by demographics and other characteristics.
- » Used focus groups with students to collect input on student experience in the machining program.
- » Explored potential issues with digital infrastructure.
- » Created paper textbook library for students who only previously had e-book option.

The overall idea [with the program goals of CTE CoLab] was … how do we make the journey into and in our program better and provide representation of students from the industry point of view because again that's what we're trying to do: create that pathway for [students of color] into industry.
—WSU Tech staff interview

Student composition, learning needs, and challenges:

- Student composition and demographic makeup:
  - » **Number of students served:** Spring 2022 enrollment: 128 students
  - » **Race and ethnicity:** A third of students are students of color. Nine to ten percent of machining students are Black or African American.
  - » **Average age of students:** Most students are nontraditional in their mid to late twenties across all cohorts. Many students are already working when they join the program at WSU Tech.
- Student learning needs and challenges:
  - » **Understanding resources available/orientation**: Students were not aware of the types of resources that were available to them as a machinist student. There was an online orientation, but it was not required.
  - » **Speaking as a machinist:** Students had trouble speaking in a way that a machinist in a shop would, raising concerns about work readiness once they left the program.

- **Managing student and work life:** Students come from underprivileged backgrounds in terms of socioeconomic status. Many students also work full time jobs outside of going to school, so they have to balance a lot of different priorities.
- **Increasing representation of industry professionals**: WSU Tech's Machining Program is about twice as diverse as the county and surrounding areas. The program needed to have more industry professionals that were representative of the student population and faced similar challenges as the students.

[Wished industry was] being more open to equitable hiring practices ... a third of our program is of racial and ethnic diversity…. What can we do to make those work environments more appealing, more conducive? What are the policy changes that we need?
—WSU Tech staff interview

Program adaptations made in response to challenges:

- **Understanding resources available/orientation:** The Machining Program created and implemented an in-person orientation process after receiving student feedback. The assistant dean of Manufacturing and Production went to all of the machining classes within the first few weeks of the spring 2023 semester to discuss resources available to students such as: career services, disability services, food bank/pantry services, library services, student success workshops, tutoring center information, and veterans' assistance and veteran's student center. Students will also receive snippets of videos that are two to three minutes long about other services and supports that are available to them.
- **Speaking as a machinist:** Getting students into the lab as much as possible so that they can physically work on machines and use the appropriate nomenclature.
- **Managing student and work life:** After focus groups were conducted and instructors had a better understanding of what students were facing, instructors felt more inclined to have conversations with students about challenges and what they were going through at home.
- **Increasing representation of industry professionals**: Staff began asking students to attend the diversity lecture series on the campus of WSU Tech and identified local machinists that can speak to some of the challenges they have faced in the field.

[As a result of conducting student focus groups] You don't really know where the students come from or what they are going through as far as home life or anything like that. You're just there as an instructor. I have always tried to get to know my students as far as how I could help them. But this has even gotten better in terms of getting to know them as a group. —WSU Tech staff interview

Notes

[1] 4.3 million students were enrolled in for-credit CTE courses at public community and technical colleges and had declared a major in a CTE "field of study" according to the US Department of Education 2015–16 National Postsecondary Student Aid Study, accessed June 1, 2023, available at https://nces.ed.gov/surveys/npsas/.

[2] See Nick Anderson and Danielle Douglas-Gabriel, "Community colleges at a crossroads: Enrollment is plummeting, but political clout is growing," *Washington Post*, March 2, 2021, https://www.washingtonpost.com/local/education/community-colleges-biden-covid/2021/03/01/7b30a18e-75df-11eb-9537-496158cc5fd9_story.html.

[3] The equity action planning tool template, including the self-assessment, action planning, and sustainability plan exercise is available for download at https://ctecolab.org/.

[4] For more information about deficit mindset, see https://www.achievementnetwork.org/anetblog/eduspeak/deficit-mindset.

[5] Students from marginalized communities may have limited access to the necessary technology (e.g., computers, laptops, reliable internet connections) and an environment conducive to learning. Limited exposure to digital tools and resources hinders the development of digital skills that allow students to navigate online learning platforms and use digital resources, therefore decreasing their engagement and learning outcomes. Online education also relies heavily on written communication and English language proficiency putting students whose first language is not English or who come from diverse cultural backgrounds at a disadvantage when it comes to understanding complex instructions, participating in discussions, or expressing themselves effectively in an online environment.

[6] We did not collect data on employment outcomes as part of the CTE CoLab because of the short timeframe of the initiative and the limited resources available for participating colleges. Few programs (even outside the CTE CoLab) access these data to understand the employment trajectories of students. We consider the collection of data on employment outcomes including employment status, wages, and benefits to be critical for assessing efforts to close racial equity gaps for students of color in CTE programs.

[7] See recording of Employer Engagement Workshop for CTE CoLab colleges by Clair Minson, CTE CoLab partner and founder of Sandra Grace, LLC available at https://www.youtube.com/watch?v=uoY3yjbD7w4.

[8] "Diversity, Equity and Inclusion Glossary," University of Washington, College of the Environment, accessed June 2, 2023, https://environment.uw.edu/about/diversity-equity-inclusion/tools-and-additional-resources/glossary-dei-concepts/.

[9] Structural Racism," Urban Institute, accessed June 2, 2023, https://www.urban.org/tags/structural-racism.

[10] "Related School Rankings," stateuniversity.com, accessed Month Day, 2023, https://www.stateuniversity.com/program/48-0501/Machine-Tool-Technology-Machinist.

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