

Annual Report
NSF IUSE HSI Project
University of Texas, Rio Grande Valley

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by



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Table of Contents

<u>Overview</u>	3
<u>Evaluation</u>	4
<u>Evaluation Questions</u>	5
<u>Methodology</u>	5
<u>Findings</u>	11
<u>What is the quality of design and implementation of the project?</u>	11
<u>Culturally Responsive Curriculum & Instruction in Gateway Courses</u>	12
<u>Fostering a Community of Practice</u>	18
<u>Faculty Workshops in Culturally Relevant Pedagogy</u>	20
<u>What is the value of the project to students?</u>	27
<u>Bilingual Teaching and Learning</u>	32
<u>Sociopolitical Consciousness</u>	33
<u>What is the value of the project to faculty?</u>	34
<u>What is the value of the project to UTRGV administrators?</u>	37
<u>What are the learnings that can be applied going forward? What barriers and enablers made the difference between successful and disappointing implementation and outcomes?</u>	39
<u>Key Findings and Implications</u>	45
<u>References</u>	46

Overview

The University of Texas Rio Grande Valley launched the *Building Capacity: Transforming Undergraduate Education in STEM Through Culturally Relevant Pedagogy and Community Engagement* project in Fall of 2018, which is a National Science Foundation (NSF) project funded by the Improving Undergraduate STEM Education (IUSE) at Hispanic Serving Institutions (HSI) Program. The ultimate goal of the project is to improve student interest in, passion for and plans to complete a STEM degree and improved student learning and skills in STEM by implementing culturally and linguistically relevant gateway courses in mathematics and science courses like biology and chemistry while engaging students in meaningful community projects, which will reach approximately 5000 students. It is an adaptive project that draws on interim and annual project evaluation data to refine strategies to achieve these goals; strategies which center faculty training in culturally relevant pedagogy that is bicultural, bilingual, and biliterate.

As part of this adaptive design, the leadership team of the five-year project met with the evaluator in October 2020 to reset the plan for evaluating the project. The team revised the expected student outcomes to include improving student interest in, passion for, and plans to complete a STEM degree as well as student learning and skills in STEM. A central strategy that the project uses to attain these results is faculty training in culturally relevant and culturally responsive teaching as laid out by Gloria Ladson-Billings (1995), and informed by the analysis of the educational experiences of Latina/o students (e.g., Valenzuela, 1999). Through this project, the team has designed and implemented immersive training experiences for interested and willing faculty members in the College of Sciences (COS) that are infused with the culture, language, and history of students, their families, and their communities.

Like other projects whose strategies begin with professional development and whose results aim for student academic success, the teaching in the classroom is where changes impacting student learning take place. In October 2020, the leadership team modified the project's Theory of Change (ToC), and Figure 1 presents its current iteration. Originally the strategies of faculty training and curriculum and instruction were conceived of as two equals that should have an impact on students. The team revised the Theory of Change to represent a causal link between faculty training and classroom instruction. The team further recognized that in the context of "academic freedom," faculty members manage their own teaching, research, and service. The strategy of faculty training was the point where the project leaders could influence change, by designing and implementing impactful experiences. The new sketch of the Theory of Change has a feedback loop for training where faculty members have the opportunity for self-reflection, plan for changes to their teaching, experiment in the classroom, and engage in personal development through the community of peers. When a faculty member steps into the classroom, all of these personal changes come to bear on students' experiences and potential results.

An additional alteration to the Theory of Change came out of the conversation about the data in this report and the project team's current thinking in January 2020. The faculty trainings in culturally responsive instruction situate in a particular place, the Rio Grande Valley, RGV, The Valley. The culture, language, community, practices and values are specific to the local context, here labeled "place."

Since the project's inception, two cohorts of up to 14 faculty members annually participated in four half-day workshops to promote their understanding and self-reflection about the experiences of UTRGV students. The workshops also provided other information, such as how to design a syllabus that reflects culturally relevant and culturally responsive pedagogy and community engagement. In addition, participants learned about resources on campus and met the leaders of key offices in pursuit of these strategies, including engaging with the community of the RGV in a bilingual, bicultural format. In response to evaluation findings from the first year, the project team added a weekend retreat for the second cohort intended to dig deep and familiarize faculty members with the history, culture, and economics of the region and to promote an assets-based perspective of the students, families, and communities of the RGV as well (*Narratives of Transformation*, Racelis et al., 2020).

As the leadership team continues to adapt to what they're learning about the personal development of the faculty members who participate in this training, it has developed new sub-strategies. In 2020, they added a pilot fellows program in which faculty members who wanted to implement culturally responsive and relevant pedagogy could receive a stipend and redesign a course in light of their personal transformation to date. In Fall 2020, three faculty members enlisted as fellows.

This annual report relates the findings for the third year of implementation to address evaluation questions. To do so, the report examines perspectives and experiences of faculty who have participated in the range of professional development workshops, fellows, the project team, and a sample of students in all three fellows' classes. It presents evaluative judgments of the findings and discusses implications.

Evaluation

The purpose of the evaluation is formative. It continues to document and assess how well the project functioned, as in previous years, and to provide information about areas to improve. The evaluation includes key conceptual tools for synthesizing the evidence, that is, the program theory (Figure 1), the evaluation rubric, and logic model. As in past years, the evaluator collaborated with Dr. Alexis Racelis, the Principal Investigator (PI), Dr. Angela Chapman and Ms. Cristina Trejo, the Co-Principal Investigators (Co-PIs), Dr. Alyssa Cavazos and Dr. Dongkyu Kim (new Co-PIs), and Dr. Francisco Guajardo (now a project consultant), to refine measures, and then collected and analyzed the data. As an evaluation, this report uses the data as evidence to make judgments about the levels of project performance from "poor" to "excellent."

Evaluation Questions

Several evaluation questions were developed for this project. The current report addresses the first three of the following five questions.

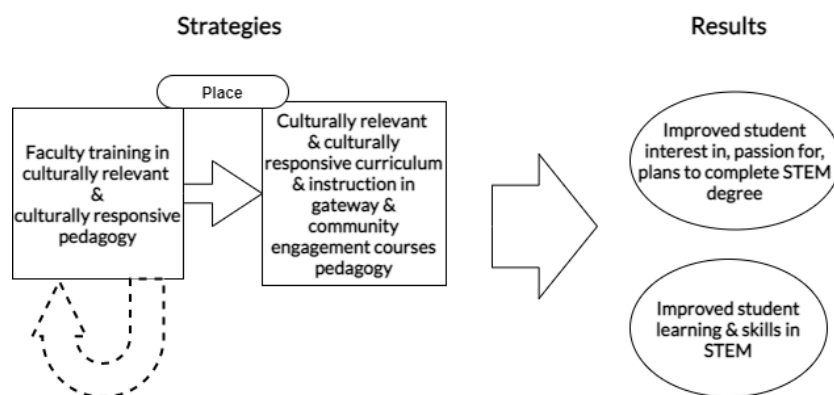
1. What is the quality of design and implementation of the project?
2. What is the value of the project to students, faculty, UTRGV administrators, and the RGV community?
3. What barriers and enablers make a difference in successful/disappointing implementation and outcomes?
4. How well does the design of the project fit with the needs of the UTRGV and local community?
5. Was it worth implementing, and is it worth continuing to support?

Methodology

The evaluation launched in October of 2019 when the evaluator visited the UTRGV Edinburg campus. The methodology of the evaluation includes a set of criteria that stakeholders developed for this project that the evaluator uses to make judgments about the performance of the project processes and outcomes (Davidson, 2005). To this end, the evaluator facilitated a meeting of a group of stakeholders, including the PI, Co-PIs, the Project Coordinator, two graduate students, and at least one other stakeholder. The task was to “paint a picture” of the evidence to use for different levels of performance of the project (Davidson, 2013). This meant developing an evaluation rubric to determine criteria, or standards, that the evaluator will compare to the evidence gathered about the project through interviews, surveys, observations, and so on. The evaluator transcribed, categorized, and organized interactive session responses into rubric criteria for evaluating project activities and outcomes. The PI, three Co-PIs, the Project Coordinator, a student assistant, and the evaluator met to review and revise the rubric (see Tables 1 and 2). In this methodology, the evaluator draws conclusions from data sources, summarizes findings, compares them to this co-constructed criteria, and rates them on a scale from “poor” to “excellent” (Oakden, 2011).

Figure 1. Program Theory

The evaluation rubric will be used to make judgments about the evidence gathered. Table 1 presents the criteria in terms of the participants and faculty and university staff involved and dimensions used to evaluate project outcomes grouped by project strategies. PI and Co-PIs also reflected upon criteria that held the greatest importance (Davidson, 2005). Just the dimensions of *faculty*



processes for the project in general reached great importance as indicated in Table 1. Table 2 presents the criteria in the same way for evaluating outcomes.

Table 1. Evaluation Criteria for Processes

Culturally-responsive curriculum and instruction in gateway courses		Importance
Faculty	It is evident that faculty: <ul style="list-style-type: none"> feel comfortable engaging in courses and in academic settings more broadly by drawing on their communities, culture, and native language, that is, with bicultural and bilingual skills as assets gain a sense of power as they explore their own stories and surface their own assets 	✓
Students	It is evident that students: <ul style="list-style-type: none"> engage in courses by drawing on their homes, communities, culture and native language, that is, with bicultural and bilingual skills as assets; feel comfortable communicating in English or in Spanish; communicate with each other at a high level about the subject matter; engage in active learning; feel they have control over their own learning 	
Faculty workshops in culturally-relevant pedagogy		
Faculty	It is evident that faculty: <ul style="list-style-type: none"> attend workshops engage in respectful, open-minded dialogue; get exposed to students' language, culture, life history as immigrants; look into their own implicit biases and explore student language and "cultural capital" as assets, not deficiencies; confront racism and micro-aggressions through diversity training explore new ways of teaching and learning; experience challenges to the way they traditionally teach students (e.g., discuss why language is important) 	

Table 2. Evaluation Criteria for Outcomes

Culturally-responsive curriculum and instruction in gateway courses		Importance
Faculty	It is evident that faculty: <ul style="list-style-type: none"> personalize instruction as a way to model culturally relevant pedagogy: including high academic expectations for students; use students' culture as a vehicle for learning; & facilitate students' development of a sociopolitical consciousness to critique cultural norms, values, & mores adopt values and attitudes that demonstrate acceptance of Spanish as an academic language and students' bicultural identity as well as their own biculturalism, if that is the case, and have positive interaction with students 	✓
Students	It is evident that students: <ul style="list-style-type: none"> are more integrated into the institution than before, that is, they feel a sense of belonging as college students; have faculty mentors; have positive interaction 	

	<p>with faculty who value their communities, language, and culture; adopt attitudes and values pertaining to acceptance of Spanish as an academic language and their own bicultural identity</p> <ul style="list-style-type: none"> • feel proud and strong about STEM and about their bilingual and bicultural skills as assets 	
Faculty workshop in culturally-relevant pedagogy		
Faculty	<p>It is evident that faculty:</p> <ul style="list-style-type: none"> • have developed personally and professionally their own power, are well-prepared, comfortable in culturally relevant pedagogy (curriculum and instruction); value students' "cultural capital," that is, community, language, culture, life history as immigrants (including bilingualism, misconceptions revealed); have changed ways of thinking about instruction and learning; are culturally competent (see second bullet for faculty under "Culturally-responsive curriculum and instruction in gateway & community engagement courses") • adopt a curriculum that is more relevant to culture of students, families, and community than before; implement tools gained in the workshops in ways that show sensitivity to students who are non-native speakers • faculty who are non-native English speakers hold and communicate beliefs that demonstrate cultural competence, such as students' communities, culture, and native language as an asset 	

Data Synthesis

The synthesis methodology enables evaluators to “draw overall evaluative conclusions from multiple findings about a single evaluand” (Davidson, 2005). The rating scale, adapted from Oakden (2011), is presented in Table 3. To draw evaluative conclusions, each data source, both quantitative and qualitative, was summarized and then the evaluation criteria were judged and rated on the continuum “poor” to “excellent.”

Table 3. Scale for Determining Merit of Evidence

Levels	Qualitative data	Quantitative data
Excellent (always)	Clear example of exemplary performance or practice: no weaknesses	90% or more agree with statements; strong, cohesive view, no dissent
Very good (almost always)	Very good to excellent performance on virtually all aspects; strong overall, but not exemplary; no weaknesses of any real consequence	80%-90% agree with statement, no dissent
Good (mostly, with some exceptions)	Reasonably good performance overall; might have a few slight weaknesses but nothing serious.	60%-80% agree with statement and no more than 15% dissent, but on key aspects
Adequate (sometimes with quite a few exceptions)	Fair performance, some serious, but nonfatal weaknesses in a few aspects	40%-60% agree with, and no more than 16% dissent, but no showstoppers
Inadequate (barely or not at all)	No clear evidence has yet emerged that the aspect of performance has taken effect	Less than 40% or more agree, but no serious dissent or showstoppers
Poor (never or occasionally with clear weakness)	Clear evidence of unsatisfactory functioning; serious weaknesses across the board on crucial aspects	Less than 40% or more agree and some serious dissent or showstoppers

Context of Project

University of Texas Rio Grande Valley (UTRGV) is an R2 public university with an enrollment of 32,441 students and a faculty of 1,591 located in the lower Rio Grande Valley where about 90% of the people are Hispanic and unemployment and poverty rates are high. The 2020 four- and six-year graduation rates are 24% and 46%, respectively. It is a border community where international culture, language, and commercial exchange are a way of life.

In addition, no one can take lightly the changes and uncertainty that the coronavirus wrought in the world in the 2020; changes which carried over into the 2020-2021 academic year. In March of 2020, colleges in the U.S. shut down their campuses and, like many, the UTRGV administration decided to deliver classes online. Some UTRGV students do not have reliable Wi-Fi connections at home, and thus, this decision and stay-at-home orders may have prevented some from accessing their classes and completing the spring semester. During the 2020-2021 academic year, UTRGV provided a substantial number of online course offerings. In response to the COVID 19 social distancing guidelines, the *Building Capacity* project team adjusted and replaced plans for in person, in place workshops with a pilot program providing financial sponsorship for three faculty fellows. From 2020-2021, 1 math, 1 biology and 1 chemistry professor implemented culturally relevant course curricula. Two of the three courses were bilingual Spanish/English.

It is important to note 2020-2021 transitions in faculty and university roles for project leaders. As of Fall 2020, Dr. Francisco Guajardo moved from work leading the UTRGV B3 institute and serving as Co-PI to work as the Chief Executive Officer at the Museum of South Texas History and a role as project consultant. Cris Trejo transitioned from work in the university administration to doctoral candidacy while maintaining her role as Project Coordinator. Dr. Alex Racelis transitioned off of his administrative role as Associate Dean of Community Engagement and Outreach for the College of Sciences while maintaining his roles as Principal Investigator and full-time Assistant Professor. Dr. Alyssa Cavazos and Dr. Dongkyu Kim have recently joined the project as Co-Principal Investigators going forward.

Data Collected

The evaluation draws evidence from interviews with two separate student focus groups and two online surveys, one for faculty who participated in the 2018 pilot, in the 2019 cohort (Cohort 1) and in 2020 (Cohort 2) professional development workshops and one for the project team, including current PI and Co-PIs. The 58 students who were enrolled in two fellows' bilingual courses received verbal and email invitations from instructional faculty to join focus groups about their bilingual course experiences. Four student volunteers and 1 translator participated. For the November 2020 focus group, a random sample of 10 was taken from 80 volunteers out of the 200 students enrolled in a fellow's chemistry class (see Figure 2), and six students showed up for the interview.

Figure 2. Representation of Sampling

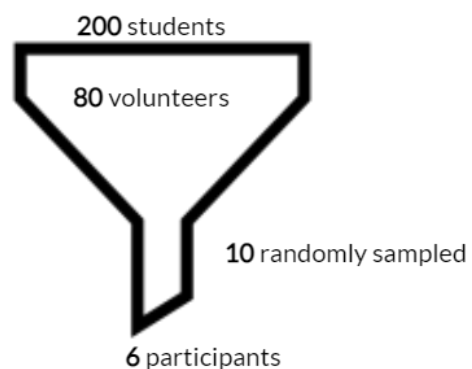


Table 4. Faculty Demographics by Cohort

N	Pilot	Cohort 1	Cohort 2
	2	11	11
Latina/o, Mexican, Mexican-American, or Hispanic	0	6	2
Not Latina/o, Mexican, Mexican-American, or Hispanic	1	5	8
Prefer not to answer	1	0	1
American Indian or Alaska Native	0	0	0
Asian	0	4	6
Black or African American	0	0	0
Native Hawaiian or Other Pacific Islander	0	0	0
White	2	5	3
Other	0	2	1
Prefer not to answer	0	0	1
Not to Slightly Fluent in Spanish	1	5	8
Moderately to Very Fluent	1	6	3
<2 years as UTRGV Faculty	0	0	0
2-3 years	0	0	1
4-5 years	0	1	0
6-10 years	2	3	3
11-15 years	0	4	1
16+ years	0	3	3

Source. UTRGV NSF HSI, Faculty Survey, May 2021

The faculty survey addressed a variety of topics related to the project’s professional development opportunities, including perception, rewards, the process of participation, motivation, reflection, impact, as well as its overall quality.

The project team completed an online survey in June 2021. The team was asked to rate how well project activities influenced faculty experiences and outcomes and to share their insights on group learning, project direction, power and group dynamics, decision-making, communication, strategies and progress markers and potential for impact.

Data Limitations

At least one limitation in the data was the format of the data sources, that is, two surveys and two focus group interviews. Additional sources, such as observations or classroom artifact analysis could provide more rich information and be used to triangulate evidence. Certainly, the data limitations reflect a tight budget for the evaluation.

Findings

This section answers the evaluation questions. The answers for the first three questions include ratings for the evaluation criteria and the synthesis of the evidence used to make the judgments.

What is the quality of design and implementation of the project?

In general, the majority of faculty are drawing on powerful workshop experiences to plan for and enact culturally relevant and community engaged teaching and learning in their STEM classrooms. As a group, participating faculty are comfortable engaging in interactive dialogues with a wide range of stakeholders both in person and in place as they learn about their own implicit biases and hone their faculty drawing on students' rich histories of lived experience in Valley communities. And faculty fellows are drawing on their own cultural assets, languages and stories as they interact with students and share culturally-relevant examples of STEM concepts in class. They arrange students in groups and welcome student linguistic, cultural assets in assignments and classroom dialogue. We hear faculty designing and enacting new ways of teaching that include using the scientific method to quantify local beach trash; facilitating family math nights at local schools; comparing densities of household liquids with family members; discussing water resources; recording, calculating and comparing local shaded and unshaded parking lot temperatures; lecturing in Spanish and building organic pollinator and shade gardens with a community group, to name a few. There is very strong evidence that faculty experienced workshops that were well-attended, organized, and impactful. The rating for faculty workshops is very good. "Very good to excellent performance on virtually all aspects; strong overall, but not exemplary; no weaknesses of any real consequence" While some faculty may not have the comfort levels that many faculty are experiencing, this is a natural part of the journey enacting culturally relevant pedagogies. It also reflects the diverse make-up of participating faculty with a wide range of experiences teaching, learning, and living in the Valley.

There is very strong evidence that participating faculty are highly motivated to develop their culturally relevant teaching practices and center students. Some have been doing this for a long time. Faculty experienced in Valley culture and relevant pedagogies are honing their skills while exchanging rich experiences with faculty in earlier phases of learning, planning, and enacting culturally relevant pedagogy in STEM courses. Some faculty are still determining whether or not they affirm students' bilingual and bicultural assets. Some faculty are prioritizing culturally responsive instructional practices while some are making durable changes to course curriculum *and* instruction. The rating for Culturally Relevant Curriculum and Instruction in Gateway and Community Engaged Courses is good. "Reasonably good performance overall; might have a few slight weaknesses but nothing serious."

Looking across quantitative and qualitative data sources, and listening to interviews with focus groups of students in faculty fellow courses, the overall project rating for 2020-2021 is very good. “Very good to excellent performance on virtually all aspects; strong overall, but not exemplary; no weaknesses of any real consequence.”

Table 5. Ratings for Project Processes

	Poor	Inadequate	Adequate	Good	Very good	Excellent
Overall						
CRCI in Gateway and CE Courses						
Faculty Workshops						

Culturally Responsive Curriculum & Instruction in Gateway Courses

The first evaluation question pertains to the project design and its implementation. This section investigates the processes that faculty participate in and the project activities that staff design and deliver.

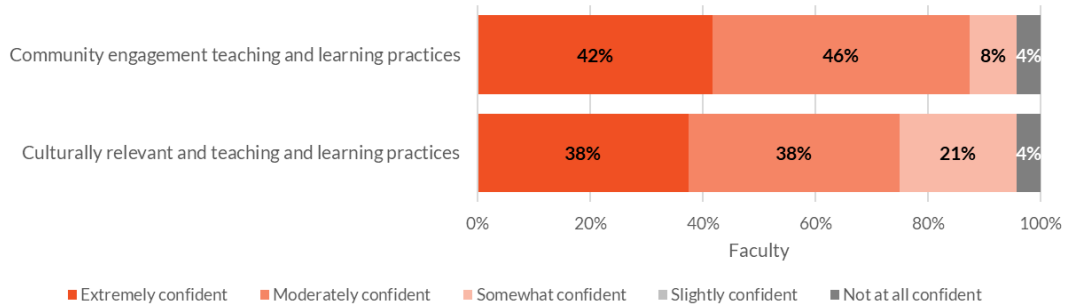
“Doing” Culturally Relevant and Community Engaged Teaching

Enacting culturally relevant curriculum and instruction (CRCI) across gateway courses requires on-going project team and faculty work simultaneously across a range of domains. Faculty must understand and draw on local history, value students’ languages, act with critical personal and professional awareness, and collaborate with community stakeholders. Data collected and synthesized around CRCI underscore participating faculty members’ increasing confidence with the concepts and skills needed to design and enact culturally responsive and culturally engaged curriculum and instruction. Faculty repertoires of culturally relevant pedagogy are expanding. This includes faculty learning to recognize and affirm students’ bilingual and bicultural assets and those faculty who are strengthening their pre-existing facility with students’ bilingual and bicultural assets. There is a burgeoning community of culturally relevant and community engaged teaching practice in participating STEM faculty.

A sense of comfort engaging culturally relevant teaching methods in courses and academic settings is a key experience that stakeholders envisioned for faculty (see Table 1). On the 2020 faculty survey, faculty were asked to rate their confidence implementing culturally relevant (CR) and community engaged (CE) teaching and learning practices on a five-point Likert scale from “not at all confident” to “extremely confident.” Across cohorts from 2018-2020, 96% of participating faculty reported feeling at least moderately confident implementing culturally relevant (18/24) and community engaged (21/24) teaching practices. Figure 3 presents these results.

Figure 3. Percentage of Faculty Confidence Implementing CR and CE Teaching Practices

96% of participating faculty felt at least somewhat confident in their capabilities to implement the following practices.

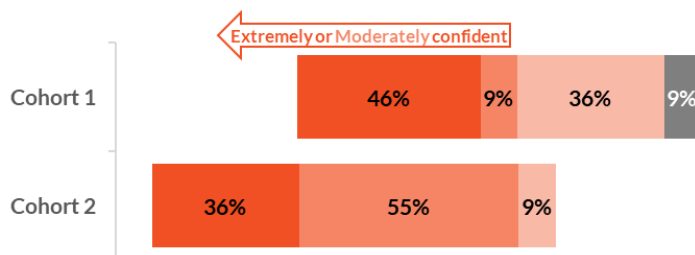


Source. UTRGV Faculty Survey, May 2021
 Note. n = 24.

While faculty in Cohort 1 and Cohort 2 reported similar levels of moderate and extreme confidence with CE teaching practices, they diverged when asked about CR teaching practices. We split out faculty responses for culturally relevant teaching and learning practices from Figure 3 by cohort and present the results in Figure 4. Four out of 11 faculty in Cohort 1 reported feeling “somewhat confident” implementing CR teaching practices, and 1/11 faculty in Cohort 2 reported feeling “somewhat confident” implementing CR teaching practices. All remaining 10/11 faculty in Cohort 2 reported a sense of moderate or extreme confidence implementing culturally relevant teaching and learning practices compared with 6/11 in Cohort 1.

Figure 4. Percentage of Faculty Confidence Implementing CR Teaching Practices by Cohort

91% of Cohort 2 felt extremely or moderately confident in their capabilities to implement culturally relevant teaching and learning practices, while 55% of Cohort 1 felt the same.



Source. UTRGV NSF HSI, Faculty Survey, May 2021
 Note. For cohort 1, n = 10; for cohort 2, n = 6.

We wonder about the distinctions between responses from faculty Cohorts 1 and 2. What factors come into play? What role does language fluency or ethnic identity play in assembling faculty cohorts? How does length of time teaching at UTRGV come into play? How might distinct bicultural, bilingual, biliterate life experiences come into play? What is the influence of project activities? We consulted Table 4, *Faculty Demographics by Cohort* above to discern differences. Six out of 11 faculty in Cohort 1 gauged themselves as moderate to very fluent in Spanish compared to three out of 11 in Cohort 2. Five out of 11 faculty in Cohort 1 gauged themselves as having zero to slight fluency in Spanish compared to eight out of 11 in Cohort 2. Six out of 11 faculty in Cohort 1 self-identified as Latino/a, Mexican, Mexican-American or Hispanic compared with two out of 11 in Cohort 2. Ten out of 11 faculty in Cohort 1 entered the project with over 6 years of teaching experience at UTRGV compared to seven out of 11 in Cohort 2. Also important, Cohort 2 participated in the retreat that was “an immersive three-day experience in which faculty explore historical and cultural sites in the Rio Grande Valley, engaged with students and community partners, and reflected on their teaching pedagogies” (Racelis et al., 2020), and Cohort 1 did not.

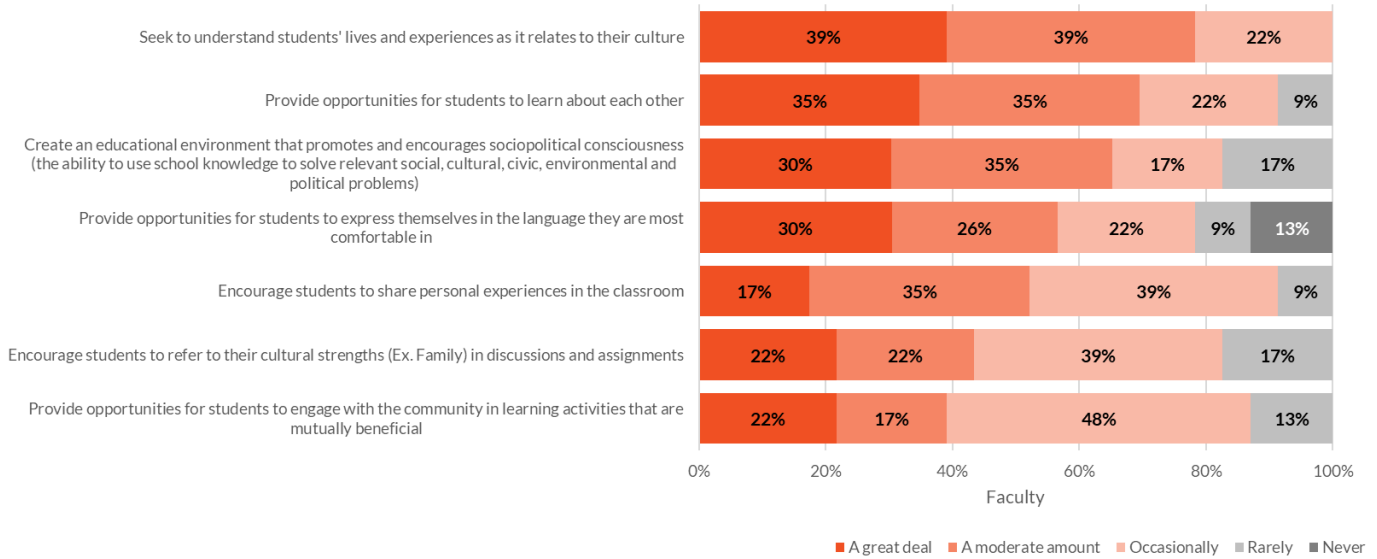
What CR and CE Practices are Faculty Actually Doing?

It is clear that faculty participating in the *Building Capacity* project are prioritizing students’ “cultural capital,” that is, community, language, culture, and life history as immigrants. This comes through in their use of specific CR teaching practices, value for students’ bilingual and bicultural assets, and high expectations for student achievement. To illustrate, faculty were asked to rate how often they use specific culturally relevant teaching practices on a five-point Likert scale from “never” to “a great deal”. A majority of responding faculty (18/23) signaled that they seek to understand student lives and experiences as it relates to their culture at least a moderate amount. No faculty reported never or rarely seeking this understanding. A majority of responding faculty (16/23) reported that they provide students opportunities to learn about each other at least a moderate amount with no faculty reporting never providing these opportunities. A majority (15/23) reported creating an environment that promotes and encourages sociopolitical consciousness at least a moderate amount.

Of the survey’s listed teaching practices, it is important to note that 11/23 faculty reported providing occasional opportunities for mutually beneficial community engaged learning and 3/23 faculty reported that mutually beneficial community engaged learning was rare. Given the project’s dual emphasis on culturally relevant pedagogy in gateway and community engagement courses, community engaged learning is an area for attention. Providing students opportunities to express themselves in the language that is the most comfortable to them is the practice that shows the most variability. Figure 5 illustrates these results.

Figure 5. Percentage of Faculty Use of Specific CR and CE Teaching Practices

78% of faculty reported seeking to understand student lives and experiences as it relates to their culture at least a moderate amount.



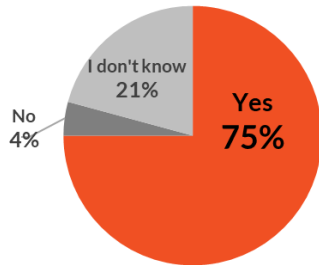
Source. UTRGV NSF HSI, Faculty Survey, May 2021

Note. n = 23.

A key feature of culturally relevant pedagogy when working with multilingual students is valuing students' full, multilingual repertoires as key assets in their teaching, learning and assessment (Garcia & Lin, 2017). This means recognizing, inviting, modeling, and/or valuing oral and written communication across Spanish and English throughout course activities and assignments. It also means welcoming and integrating students' cultural assets in course curriculum and instruction. Faculty were asked if they foster acceptance for bilingualism and biculturalism with students in their courses at UTRGV. A strong majority of faculty (18/24) confirmed that they do affirm bilingualism and biculturalism to students. Five faculty reported that they were unsure, and one faculty member stated that they did not. Figure 6 conveys the results.

Figure 6. Percentage of Faculty Communicating Acceptance of Bilingualism/Biculturalism

75% of Participating Faculty communicate acceptance of bilingualism and biculturalism with their students.

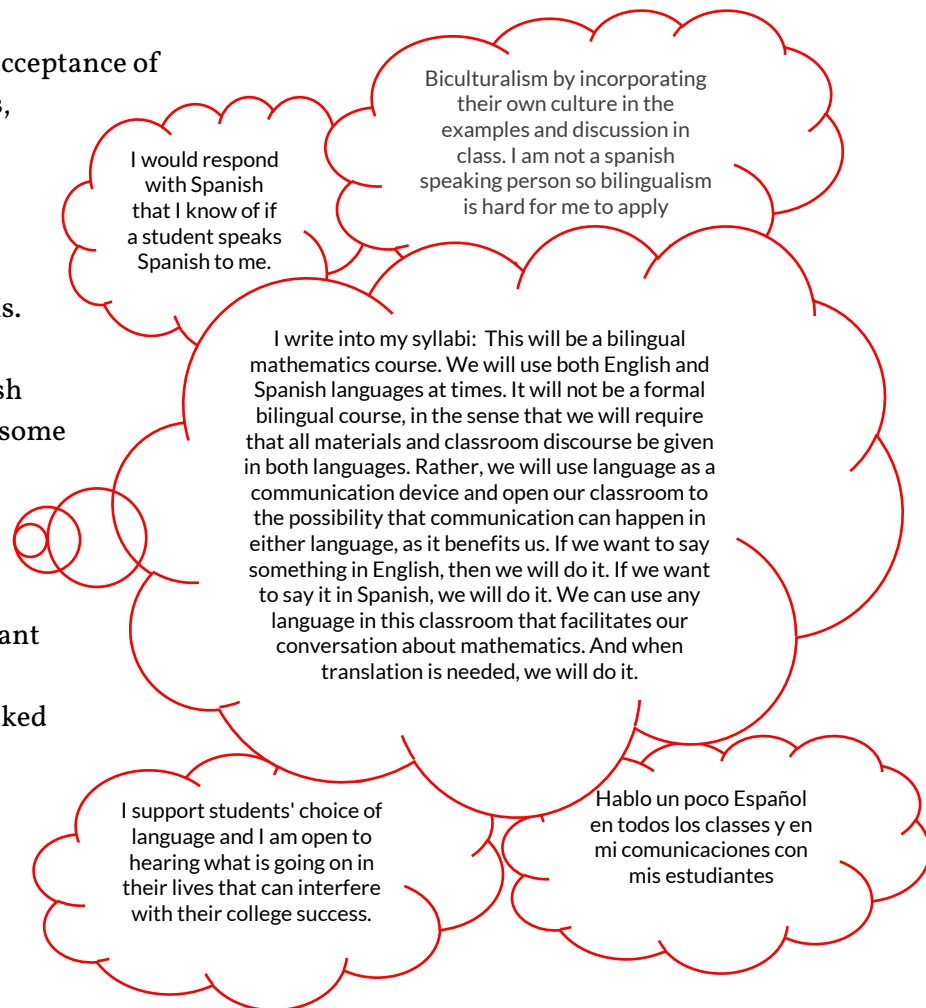


Source. UTRGV NSF HSI, Faculty Survey, May 2021
 Note. n = 24.

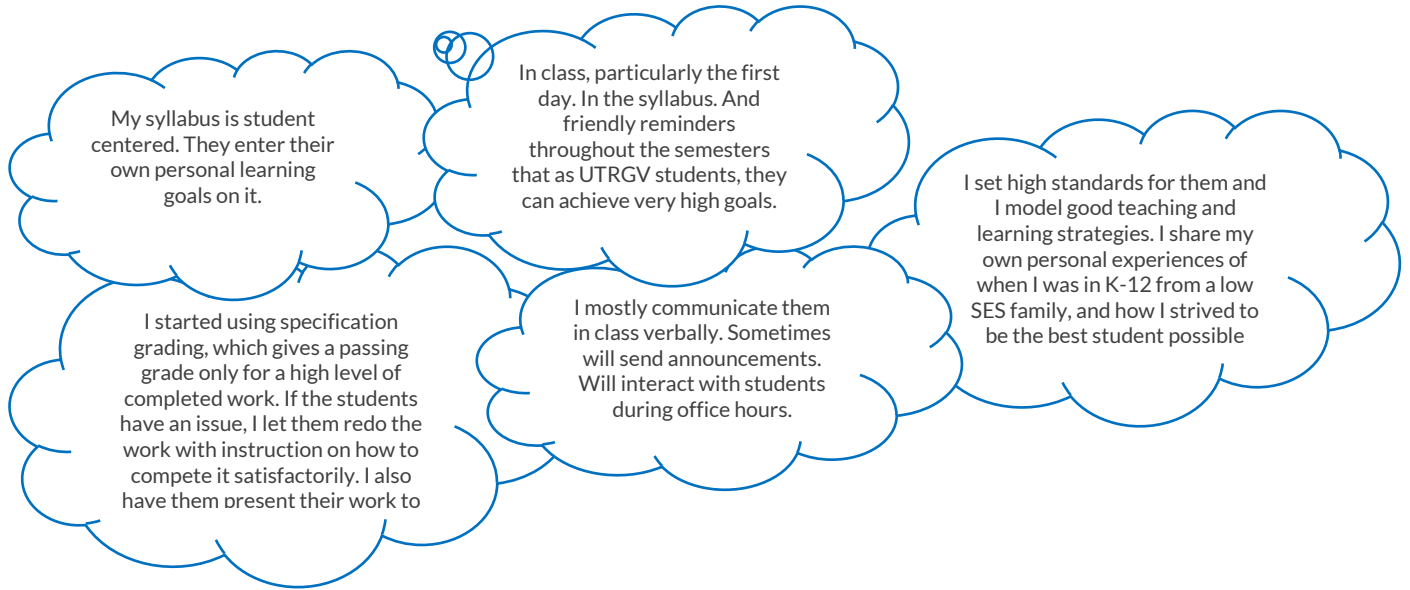
When asked how they communicate acceptance of students' linguistic and cultural assets, responses ranged widely from formal mechanisms like messages posted in syllabi and informal mechanisms like oral communication in class. Most faculty described oral communications. One faculty member underscored the challenge of doing this without Spanish language fluency. Another noted that some students are less fluent in Spanish. See red thought bubbles in their own words.

Teachers proficient in culturally relevant pedagogy maintain high academic expectations for all students. When asked how they communicate high expectations for students' academic performance, faculty noted a variety of informal mechanisms for communication like, "continuous checking in on students' progress and mindset," "emails, writing and group conversations"

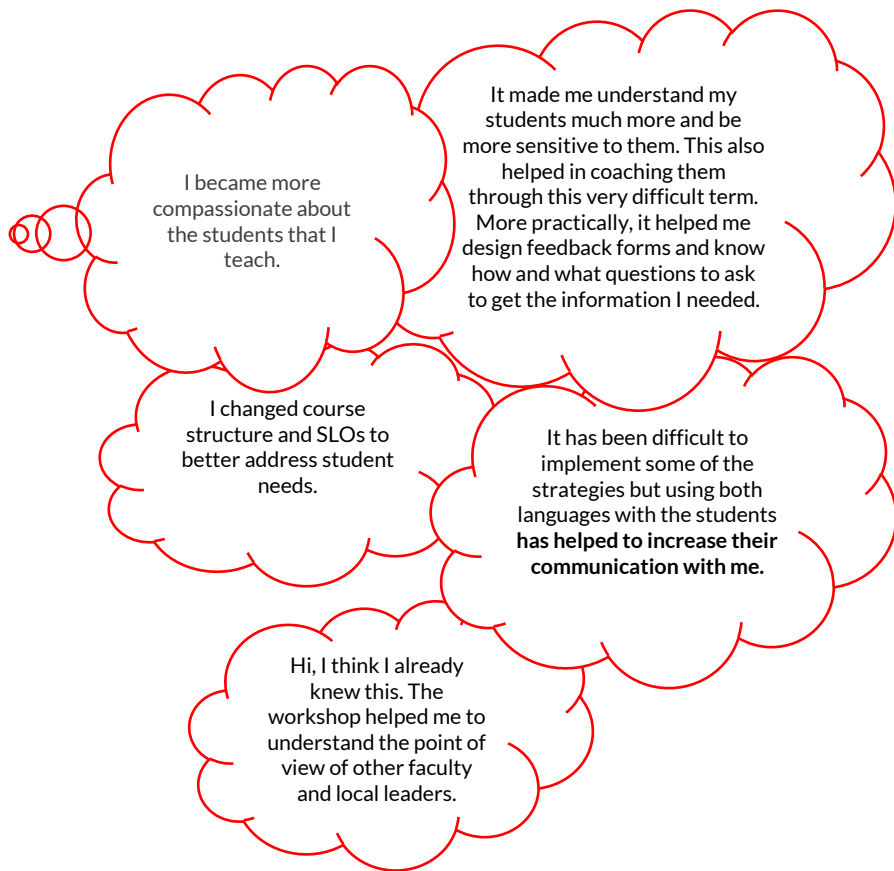
and "telling them that they have a bright future." Some faculty identified more formalized curricular



and class structures like “feedback on assignments,” “learning objectives for individual subject matters” and “through the syllabus.” Five faculty pointed to the syllabus as a place for communicating high expectations. Some mentioned forms of assessment, and one faculty member related personal experience sharing. See blue thought bubbles.



To understand the impact workshops have made on classroom instruction, faculty were asked how they've modified existing teaching methods for online instruction. The majority of faculty explained changes akin to communicating in culturally and linguistically responsive ways. Within this category, responses ranged widely from speaking in Spanish and English, being more "sensitive," "lenient" or "compassionate" given students' responsibilities, or developing feedback forms for course changes (see red thought bubbles). A few faculty members noted substantive changes to course structure or developing new curriculum content. For example, a professor noted moves away from "conventional knowledge feeding mechanisms" and another colleague described culturally relevant course curriculum content like "family-centered chemistry activities". One faculty member conveyed a pre-existing understanding of culturally relevant pedagogy that expanded to include colleague and community perspectives.



In November 2020 and May 2021 focus group interviews, students related specific instances when teachers integrated culturally relevant content into course activities. Some examples included collaborative chemistry activities students were invited to complete with family members prior to class start. Others described how faculty put current US health issues like diabetes rates into a Rio Grande Valley-specific context. One student referenced occasional math questions that integrated research and studies from regions in Mexico (see blue thought bubbles).

some of the [math] questions that we would get incorporated studies or research from different regions of Mexico. That was very culturally involved and it was very sparse. It did happen but not regularly.

I did the first one with my son. That one was density, so vegetable oil, vinegar, water, so anything we had in the household.... After that, he was like, "Mommy, are we going to do another experiment?" He wanted to keep going. It was nice to involve him & open up his mind & get them ready, show him, introduce him to what we were doing, but also letting him know that it's fine. Science can be fine. It's not all hard & boring, the way it's viewed to be.

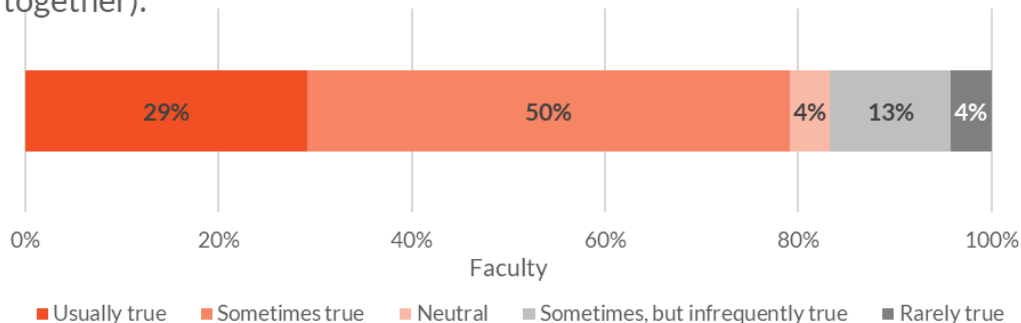
She would always relate the topic to whatever is going on, like certain trends. If it has to do with clogging of the arteries, she would relate that. That's really common here, and it would result in heart attack, high percentage of diabetes here, and typical issues in The Valley. So she would kind of relate that, compared to El Paso where you really don't have as much people with diabetes. She's not going to focus on that as much as if she was teaching here in The Valley, so that's how I feel she would relate to our culture in The Valley to what she was teaching.

Fostering a Community of Practice

A best-practice in professional development is establishing and fostering communities of practice; collegial groups that regularly share resources, hone skills and troubleshoot problems of practice (Lave & Wenger, 1991) within and beyond workshops. Faculty were asked to gauge how often they felt part of a community of practice on a five-point Likert scale from "rarely true" to "usually true." Figure 7 presents the results. A substantial majority of faculty reported sometimes or usually feeling part of a community of practice.

Figure 7. Percentage of Faculty Feeling Part of a Community of Practice

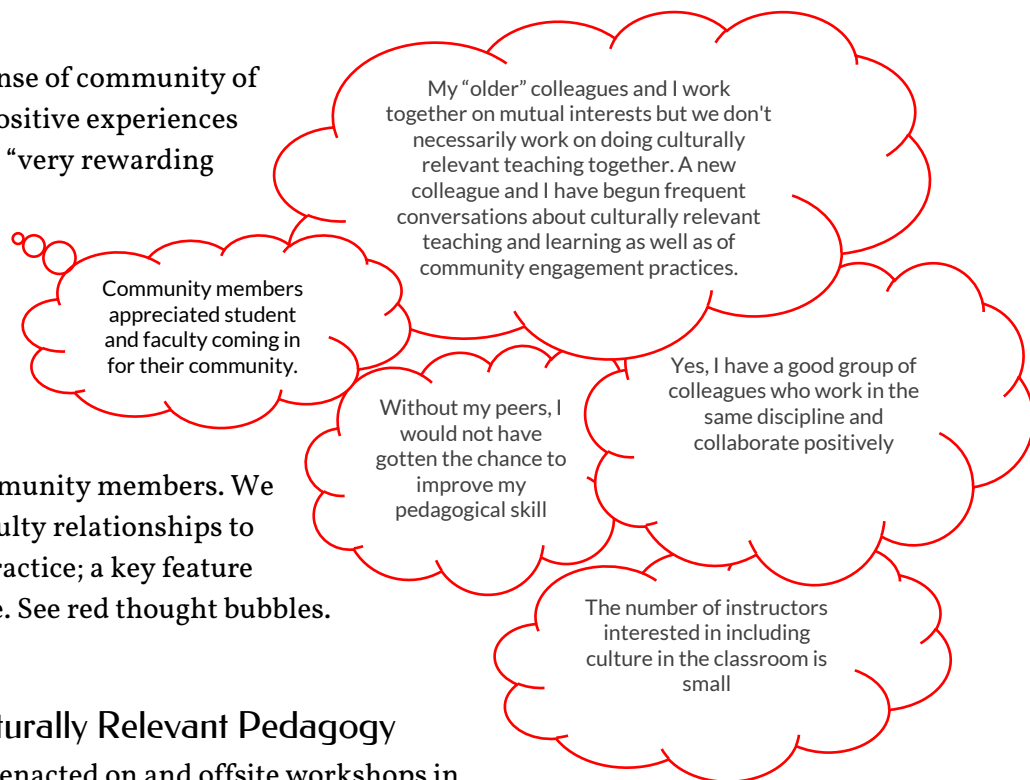
I feel part of a community of practice (a group of people who share an interest and work to create and learn together).



Source. UTRGV NSF HSI, Faculty Survey, May 2021

Note. n = 24.

When asked to explain their sense of community of practice, most faculty shared positive experiences with university colleagues like, “very rewarding experience.” One faculty member shared a felt sense that the community of practice was small. Another faculty member extended the community of practice beyond university faculty to include students and local community members. We can hear the broad range of faculty relationships to this emerging community of practice; a key feature to situated learning across time. See red thought bubbles.



Faculty Workshops in Culturally Relevant Pedagogy

The project team designed and enacted on and offsite workshops in 2019 and 2020 to build faculty capacity with culturally relevant curriculum and instruction. There are strong positive indicators that UTRGV faculty are increasing in cultural proficiency as a professional community and attribute this increasing proficiency to these NSF sponsored project’s workshops. This is evident in faculty preference for interactive discussions, faculty navigating workshops designed to challenge deficit beliefs, and comfort amplifying and integrating students’ linguistic and cultural assets into classroom curricula. Overwhelmingly positive responses to

questions directly attributing impact to project workshops are strong signals of the project’s power to transform and build faculty capacity for culturally relevant pedagogy.

The 2019 annual report for the *Building Capacity* project drew on Nuri-Robins, Lindsey and Terrell’s (2005) continuum of cultural proficiency to assess faculty interview responses. As reported for this evaluation in 2019, most of the responses from the several faculty members who we interviewed landed in the cultural pre-competence zone, meaning statements demonstrated faculty members’ understanding of limitations in their own knowledge and skills (see definition in Table 6 below). Some statements demonstrated cultural competency as faculty members assessed their own level of knowledge and/or skills. Statements reflecting cultural competence included observations of RGV culture, valuing of diversity, and actions taken to adapt to local culture. In contrast, statements in one of the interviews fluctuated between cultural incapacity, blindness, and pre-competence.

Table 6. Cultural Proficiency Continuum

Points on Continuum	General approach
Cultural destructiveness	Eliminating other people’s cultures
Cultural incapacity	Believing in the superiority of one’s own culture and behaving in ways that disempower another’s culture
Cultural blindness	Acting as if cultural differences do not matter or as if there are no differences among and between cultures
Cultural pre-competence	Recognizing the limitations of one’s knowledge and skills or an organization’s practices when interacting with other cultural groups
Cultural competence	Interacting with others using as the standard the five essential elements (i.e., assess culture, value diversity, manage the dynamics of difference, adapt to diversity, institutionalize cultural knowledge)
Cultural proficiency	Esteeming culture, interacting effectively in a variety of cultural groups, committing to continuous learning

Source. Nuri-Robins, Lindsey, Lindsey, and Terrell (2005)

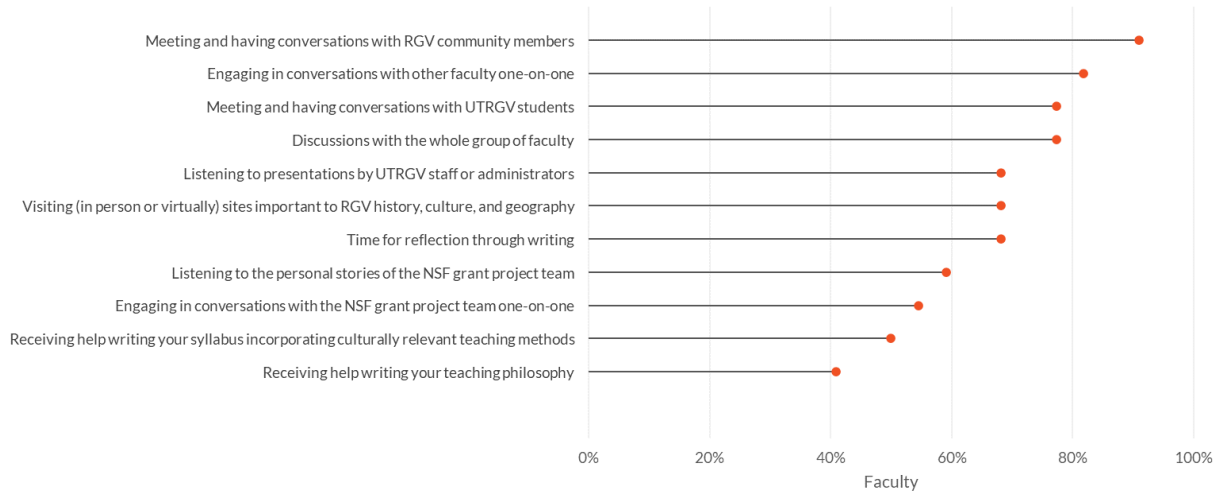
Pedagogies for developing cultural proficiency require participants to engage in dialogue and reflection that may prompt discomfort. Comfort or facility working with discomfort is an essential part of the process people engage in to strengthen cultural proficiency (Boler, 1999). Questions in the 2020 faculty survey asked faculty to report on mechanisms for developing cultural proficiency, that is, moments when they were invited to reflect on their beliefs, experience challenges to their beliefs, converse about culture, and perceive student languages and cultures as assets for teaching and learning.

When asked to identify specific professional development activities that promoted reflection on beliefs about UTRGV students, most faculty reported that reflection occurred through direct conversations with people (e.g., with RGV community members, with faculty 1:1, with faculty as a whole group, and with UTRGV students). Faculty rated writing and taking trips as the second most valuable reflective practice along with presentations by administrators and staff. Conversations across stakeholder groups demonstrate the time and necessity to get people together – a factor

complicated by COVID-19 protocols mandating social distancing and relegating much professional interaction to online platforms like Zoom. Nine faculty identified the reflective impact of revising a teaching philosophy. Figure 8 illustrates the most to least reflective professional development experiences.

Figure 8. Percentage of Opportunities to Reflect on Beliefs about UTRGV Students

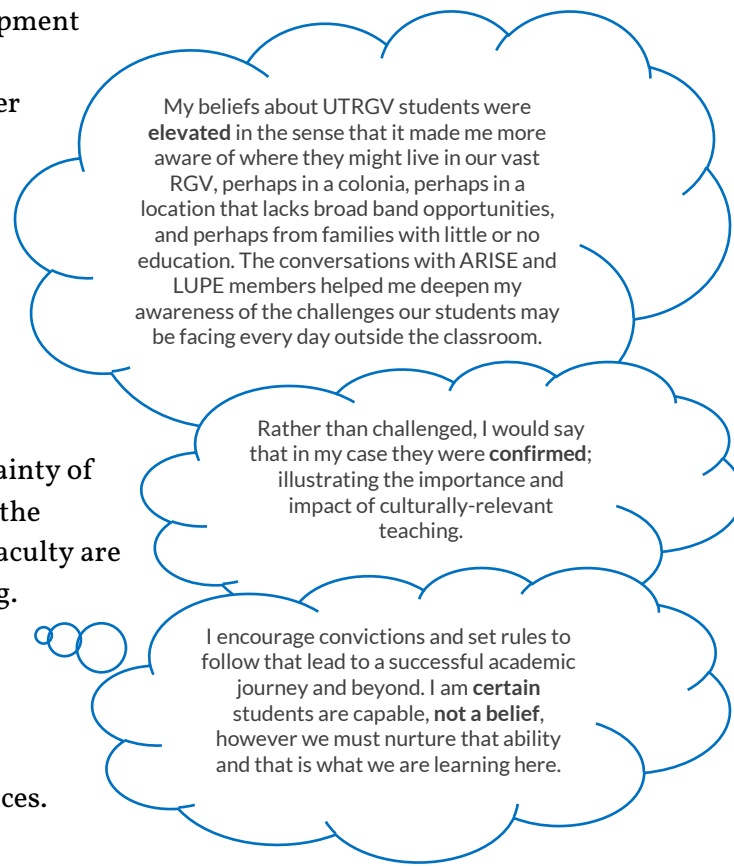
90% of faculty found meeting and conversing with RGV community members, other faculty, and UTRGV students most helpful in reflecting on their beliefs about UTRGV students.



Source. UTRGV NSF HSI, Faculty Survey, May 2021

Note. n = 22.

When asked to describe how professional development activities challenged their beliefs about UTRGV students, one faculty member described the power of discussions with community organizations. Four faculty reframed the question's emphasis on "challenge" to different language that underscored their pre-existing beliefs in or knowledge of students' cultural assets, (e.g., "confirmed," "elevated," "expanded"). Two faculty directly countered the survey question's assumption that they held beliefs that required challenging, continuing to expound on their certainty of student assets. These reframes and challenges to the language of the survey represent one way some faculty are confirming a commitment to continuous learning. Continuous learning is a key feature of cultural proficiency (Nuri-Robins et al., 2005). Most of these reframes and challenges to the question's language (5/6) came from faculty participating in Cohort I. See blue thought bubbles for faculty voices.



My beliefs about UTRGV students were **elevated** in the sense that it made me more aware of where they might live in our vast RGV, perhaps in a colonia, perhaps in a location that lacks broad band opportunities, and perhaps from families with little or no education. The conversations with ARISE and LUPE members helped me deepen my awareness of the challenges our students may be facing every day outside the classroom.

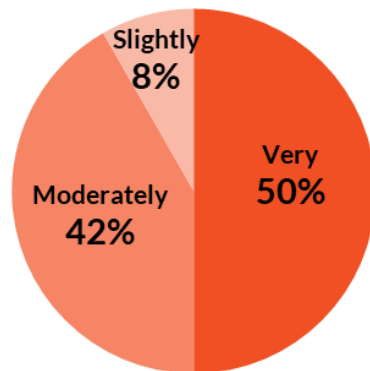
Rather than challenged, I would say that in my case they were **confirmed**; illustrating the importance and impact of culturally-relevant teaching.

I encourage convictions and set rules to follow that lead to a successful academic journey and beyond. I am **certain** students are capable, **not a belief**, however we must nurture that ability and that is what we are learning here.

Professional development workshops centered participants' deep discussions about language, culture and history. Faculty were asked to rate their degree of comfort engaging in conversations with other faculty around the language, culture and history of the people of RGV using a four-point Likert scale from "not at all comfortable" to "very comfortable." Over 90% of faculty (22/24) reported feeling very or moderately comfortable. Two faculty reported feeling slightly comfortable. These results indicate that most faculty are at least moderately comfortable conversing with other faculty about language, culture and history of the people living in the Rio Grande Valley; their place-based teaching context. And discomfort in two faculty might also be interpreted as part of the process people go through working toward increased levels of cultural proficiency. These are strong markers of faculty progress toward cultural proficiency as they navigate and support one another's on-going professional and personal growth through complex conversations. Figure 9 depicts these ratings.

Figure 9. Percentage of Degree of Comfort Discussing RGV Language, Culture and History with Faculty

During workshops, **92%** of participating faculty felt **moderately to very comfortable** engaging in conversations with other faculty about the language, culture, & history of the people of RGV.

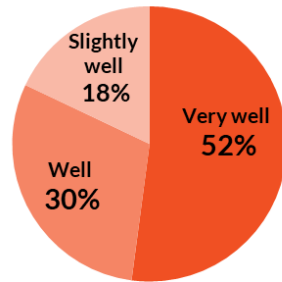


Source. UTRGV NSF HSI, Faculty Survey, May 2021
Note. n = 24.

Culturally relevant pedagogy requires that faculty understand the concept of assets-based teaching, practices that recognize, affirm and center students' culture and language in course curriculum and instruction. The survey asked faculty to indicate how well workshops helped them understand the concept of students' culture and language as assets as opposed to deficiencies using a four-point Likert scale from "not well at all" to "very well." Nineteen out of 23 responding faculty emphasized that workshops did this well or very well. Less than 10% of surveyed faculty reported that workshops did this slightly well. No faculty responded not well at all. This is strong evidence of workshop design and implementation that educates faculty about students' cultural and linguistic assets. Figure 8 illustrates this achievement.

Figure 10. Percentage of Workshops Helping Faculty Understand Assets-based Teaching

82% of participating faculty felt **workshops helped understand** the concept of students' language and culture as **assets**, not deficiencies well or very well.



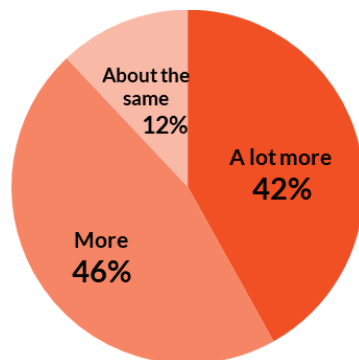
Source. UTRGV NSF HSI, Faculty Survey, May 2021

Note. n = 23.

88% of participating faculty feel more comfortable with students' culture, language, and history now, than they did before the NSF faculty workshop.

Faculty were asked to gauge the change NSF workshops made on their comfort with students' culture, language and history on a five-point Likert scale from "a lot less comfortable" to "a lot more comfortable". Twenty-one of 24 faculty reported being more and a lot more comfortable with students' cultural assets (culture, language and history) and attributed this increased comfort to the NSF workshops. Three faculty reported that their comfort levels remain unchanged. Figure 11 bears this out.

Figure 11. Percentage of Faculty Feeling Comfortable with Students' Cultural Assets



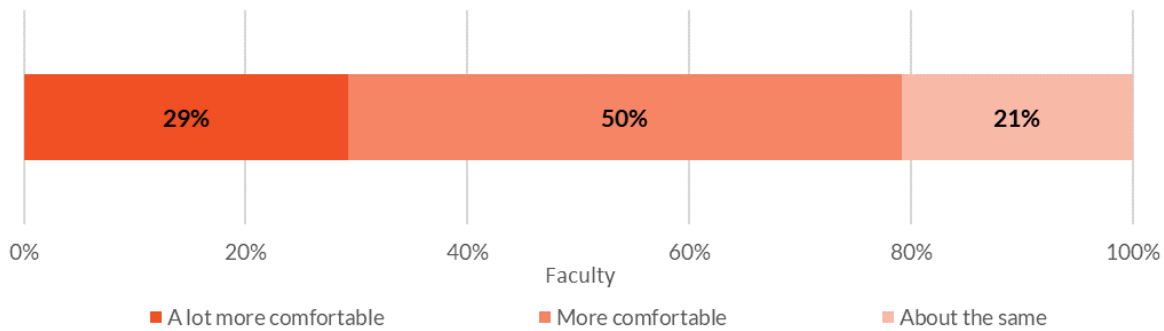
Source. UTRGV NSF HSI, Faculty Survey, May 2021

Note. n = 24.

79% of participating faculty feel more comfortable with integrating UTRGV students' bicultural and bilingual skills in their courses, than they did before the NSF faculty workshop.

Faculty were asked to assess the workshop's impact on their comfort with integrating students' bilingual and bicultural skills into coursework on a five-point Likert scale from "a lot less comfortable" to "a lot more comfortable". Again, a strong majority of faculty (19/24) indicated they felt more or a lot more comfortable with integrating students' bilingual and bicultural skills in courses as a result of the NSF workshops. Five faculty reported that their comfort levels were unchanged. Figure 12 demonstrates these substantial increases in faculty comfort.

Figure 12. Percentage of Faculty Comfortable Integrating Bilingual & Bicultural Skills



Source. UTRGV NSF HSI, Faculty Survey, May 2021
 Note. n = 24.

Responses illustrated in Figure 11 and Figure 12 are positive indications of the NSF workshops' impact on faculty comfort levels with students' cultural assets. Side by side, we can see that while a strong majority of participating faculty (21/24) are more comfortable with students' cultural assets (culture, language, history), four of those 21 faculty whose comfort with assets increased are not yet comfortable integrating those assets (bilingual and bicultural skills) into courses; using students' linguistic and cultural assets as a vehicle for learning in curriculum design, assignments, activities and assessments. As program leaders look to develop future workshops, leaders could look at targeted supports that move faculty from comfort with the *presence of biculturalism* to faculty *integrating bicultural skills* into course curriculum. Future data collection might also include focus group discussions with faculty who report unchanged comfort levels as there do not appear to be any surface-level correlations with faculty Spanish language fluencies, racial, or ethnic identities according to our review of the survey data.

To sum up, almost all of the faculty participating in the *Building Capacity* workshops have sensed the positive impact of the workshops on both their understandings of students cultural and linguistic

assets and their skills integrating these assets into their teaching. Most faculty are comfortable with the complex conversations and reflections required to participate in on-going professional and personal development necessary to continually strengthen their capacity to design and enact culturally relevant pedagogies. There are a few faculty members who did not experience substantial positive impact on understanding or comfort. From distinct narrative responses, it is possible that some of those faculty reporting a lack of change may already have a high capacity to enact culturally relevant pedagogy going into the workshops. It is also possible that a couple may be experiencing some of the cognitive dissonance and discomfort that come from challenges to personal and professional cultural histories and identities; part and parcel of the cultural proficiency learning process. In either regard, these faculty may need tailored supports that warrant further inquiry. Overall, the *Building Capacity* workshops are positively impacting the majority of faculty members' capacities to enact culturally relevant pedagogies.

What is the value of the project to students, faculty and administration?

It is evident that interviewed students and surveyed faculty place a high value on their COS-NSF related experiences. Students in fellows' courses related the sense of comfort, curiosity excitement and fun engendered through shared language experiences and activities that drew on their own and families' funds of knowledge living in the Valley. A couple of students in the focus groups referenced the importance of translanguaging in support of STEM learning and future career and higher education pursuits. These students experienced a sense of pride in bilingual and bicultural assets.

Faculty are developing comfort with the presence of students' cultural assets, reference increased confidence in their capacity to enact CR and CE teaching practices and are changing ways of thinking about CR and CE curriculum and instruction. All of these changes involve the discomfort involved in transformation that a few relate. Faculty are adopting more relevant curriculum and teaching practices, are widely implementing tools like working to understand students' lives and experiences as they relate to their culture and are experiencing an immediate increase in positive interactions with students. Some faculty are learning to navigate and communicate their acceptance of students' bilingual skills. All relate increased comfort with the presence of students' cultural assets. Based on the clear value for and evident impact of workshops, the rating for faculty workshops is excellent: "Clear example of exemplary performance or practice: no weaknesses." The on-going work lies in centering students' bilingual and bicultural assets in curriculum design, instructional implementation and assessment. As the project progresses and data collection continues, we anticipate insights into the student outcomes of rich personal and professional development across participating faculty. Based on the positive, diverse responses from faculty developing awareness of and building skills designing CR and CE teaching practices alongside positive responses from faculty honing skills integrating CR and CE teaching practices, the rating

for CRCI in Gateway Courses is good: “Reasonably good performance overall; might have a few slight weaknesses but nothing serious.”

Weighing the overwhelmingly high value for faculty workshops with the time-intensive work developing a diverse faculty’s capacities for integration of students’ linguistic and cultural assets into STEM courses, the overall project rating is very good: “Very good to excellent performance on virtually all aspects; strong overall, but not exemplary; no weaknesses of any real consequence”.

Table 7. Ratings for Project Outcomes

	Poor	Inadequate	Adequate	Good	Very good	Excellent
Overall						
CRCI in Gateway Courses						
Faculty Workshops						

What is the value of the project to students?

To glimpse the value of the project to students at this third year of implementation, we coded data gathered from two separate focus group interviews conducted with students in three different courses (chemistry, math, biology) taught by faculty fellows. These focus groups hint at what’s emerging in CR and CE courses. Math and biology courses were listed and taught as bilingual courses by faculty who self-identified as very proficient in Spanish speech, writing and comprehension. Given that this project endeavors to support and increase students’ academic achievement through on-going formal and informal opportunities for faculty professional development around culturally relevant and community engaged teaching and learning, the project team in collaboration with the evaluation team established a set of criteria for evaluating student-specific processes and outcomes noted in Tables 1 and 2 above.

Interview topics included: enrollment, prior experiences with bilingual coursework, meaningful course experiences, examples of culturally relevant (including bilingual) curriculum and teaching, and perceived benefits to culturally relevant and community engaged learning.

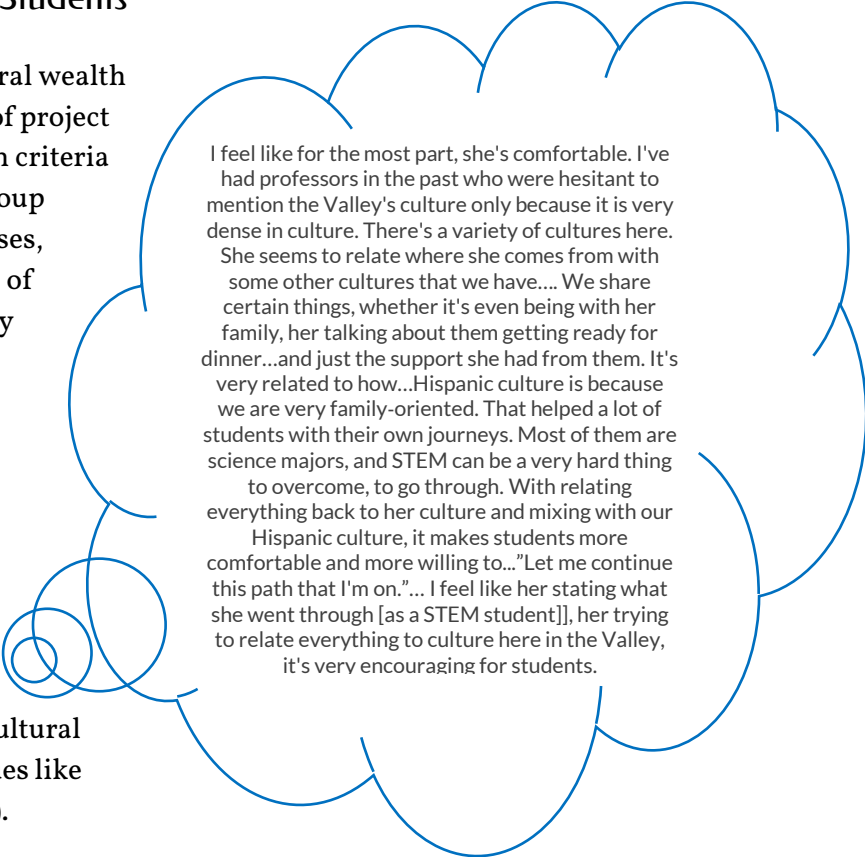
In both focus group interviews, all students described the positive interactions they had with course faculty who valued their communities, language and culture. In a few instances, students pinpointed the value they saw for honing academic Spanish language skills to use in school and post-graduation. Across interviews students related examples of course activities with relevance to their everyday lives and in some cases, Valley-specific issues and needs. Valley-specific issues and needs raised sociopolitical questions about the Valley’s long history as a region with assets often undervalued or diminished in dominant US culture.

Through a sampled, qualitative lens, students' value for the project is very good. This means interviewed students are experiencing very good and excellent implementation of culturally relevant pedagogy in virtually all aspects. They value culturally relevant course experiences. While students in bilingual courses noted issues with time to learn in two languages and challenges when Spanish language fluency fluxed, those issues resolved or seemed of little consequence in their overall value for culturally relevant course experiences. And students in culturally relevant Chemistry repeatedly answered questions about disadvantages to integrating student culture into Chemistry with advantages. When pushed to weigh on the question of disadvantages, the students affirmed that they saw none. As one student stated, "I honestly can't think of a disadvantage."

Nonetheless, we consider this evidence in the context of a self-selected sample of students in classes led by fellows, who are leaders in implementing CRCI. Their experiences and attitudes may or may not generalize to students who did not volunteer for the focus group or enrolled in courses taught by faculty members implementing moderate or low levels of CRCI.

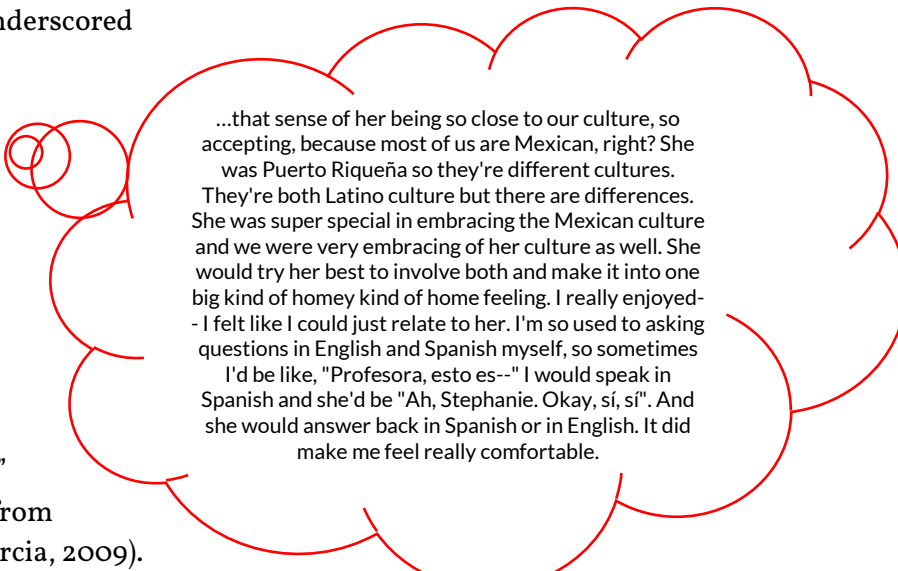
Instructor Comfort and Rapport with Students

The instructor's comfort level with the cultural wealth of the Valley is both a process and outcome of project strategies, which is detailed in the evaluation criteria in Tables 1 and 2 above. Across both focus group interviews with students from all three courses, we asked students how their instructors' use of culturally relevant pedagogies shaped faculty relationships with students. Students described the rapport they experienced with faculty across shared cultural values and shared language. In one course, when asked about the instructor's comfort level with bringing in the cultural wealth of the Valley, the students felt the instructor was competent (see November, 2020 report for additional detail). One student described the ways the professor brokered cultural exchanges with students around shared values like family-orientation (see blue thought bubble).



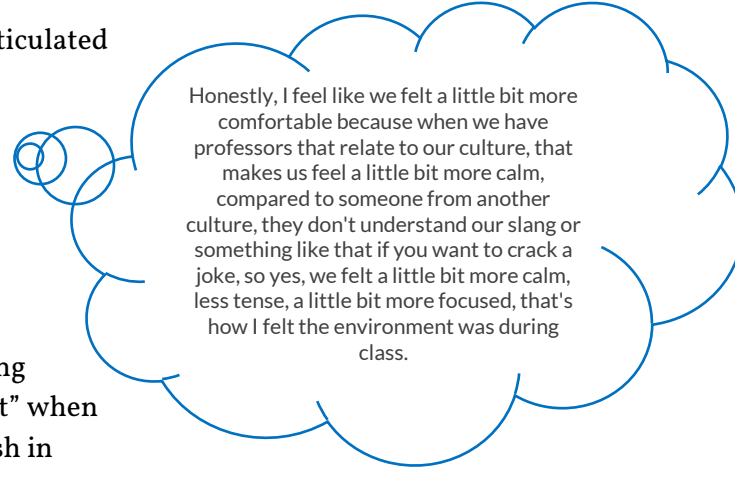
I feel like for the most part, she's comfortable. I've had professors in the past who were hesitant to mention the Valley's culture only because it is very dense in culture. There's a variety of cultures here. She seems to relate where she comes from with some other cultures that we have.... We share certain things, whether it's even being with her family, her talking about them getting ready for dinner...and just the support she had from them. It's very related to how...Hispanic culture is because we are very family-oriented. That helped a lot of students with their own journeys. Most of them are science majors, and STEM can be a very hard thing to overcome, to go through. With relating everything back to her culture and mixing with our Hispanic culture, it makes students more comfortable and more willing to..."Let me continue this path that I'm on..." I feel like her stating what she went through [as a STEM student]], her trying to relate everything to culture here in the Valley, it's very encouraging for students.

Students in bilingual courses similarly underscored how faculty built rapport through and beyond shared language. One student explained how a professor from Puerto Rico valued students' Mexican cultural assets, shared connections and distinctions to her own Puerto Rican cultural assets while translanguaging across Spanish and English (see red thought bubble) – a feature of shared Latino culture. Translanguaging centers multilingual speakers' languages “in use,” that is, “dynamic bilingualism”; distinct from learning and using *separate* languages (Garcia, 2009).

A red thought bubble with a decorative swirl on the left side, containing a student's quote.

...that sense of her being so close to our culture, so accepting, because most of us are Mexican, right? She was Puerto Riqueña so they're different cultures. They're both Latino culture but there are differences. She was super special in embracing the Mexican culture and we were very embracing of her culture as well. She would try her best to involve both and make it into one big kind of homey kind of home feeling. I really enjoyed - I felt like I could just relate to her. I'm so used to asking questions in English and Spanish myself, so sometimes I'd be like, "Profesora, esto es--" I would speak in Spanish and she'd be "Ah, Stephanie. Okay, sí, sí". And she would answer back in Spanish or in English. It did make me feel really comfortable.

Students in bilingual courses with Spanish fluency articulated the ways shared language fostered a sense of shared culture. This sense of shared language and culture often translated to a sense of comfort in the classroom environment. One student saw the connections between this sense of calm and increased ability to focus (see smaller blue thought bubble). Students noted echoes to childhood learning experiences, bilingual high school courses, shared slang and jokes, and a general feeling of “fun” or “excitement” when relating to faculty members across English and Spanish in STEM courses.

A blue thought bubble with a decorative swirl on the left side, containing a student's quote.

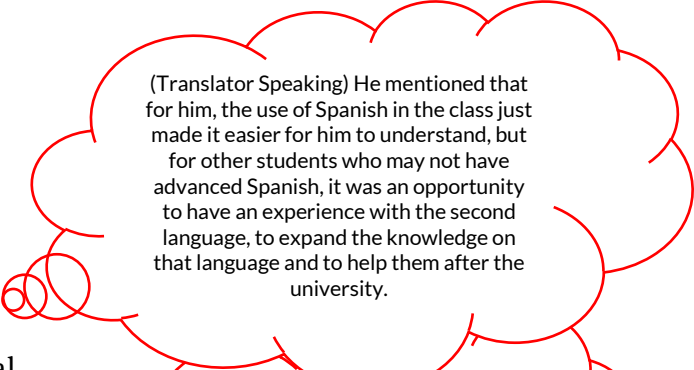
Honestly, I feel like we felt a little bit more comfortable because when we have professors that relate to our culture, that makes us feel a little bit more calm, compared to someone from another culture, they don't understand our slang or something like that if you want to crack a joke, so yes, we felt a little bit more calm, less tense, a little bit more focused, that's how I felt the environment was during class.

Bilingual Teaching and Learning

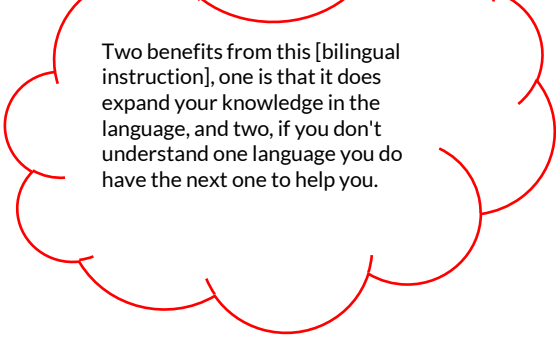
A key feature of culturally relevant pedagogy in bilingual/bicultural contexts is communicating in culturally and linguistically responsive ways. Teachers who demonstrate this competency convey their understanding of students' bilingualism as a valuable asset to classroom learning and future academic and career pursuits. One of the focus group interviews combined students from two bilingual courses. In that interview, we asked students to elucidate the benefits of speaking Spanish in math and biology class. Students appreciated the opportunity to use both languages (English and Spanish) for deeper comprehension and academic Spanish development (see red thought bubbles). One student wanted to see more bilingual STEM courses offered and promoted.

Students noted some of the challenges to bilingual coursework. One of those challenges the range of students' Spanish and English fluency. Some students were primary English speakers and some students relied more heavily on their Spanish language fluency. Sometimes the bilingual teaching model used equal amounts of time to introduce content in each language. A couple of students found academic instruction in two separate languages initially time-consuming. Students also mentioned it took some time to adjust (see red thought bubbles).

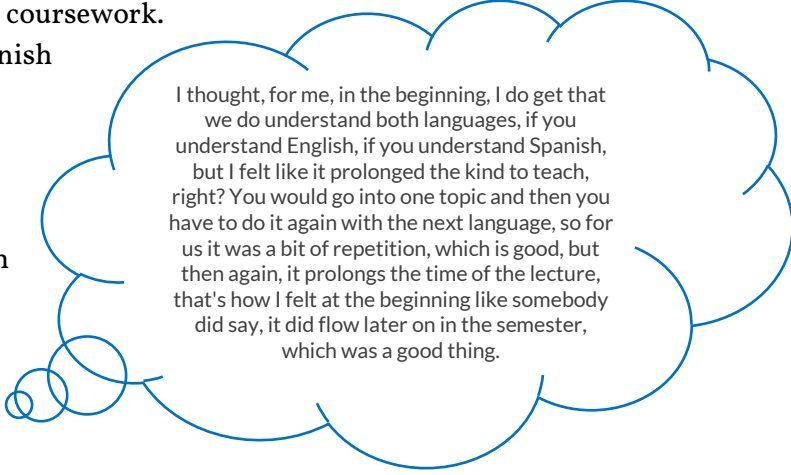
We want to share that several students look forward to more intentional recruitment and public advertising of bilingual courses and are encouraging their friends and siblings to take bilingual courses. They wish the courses were advertised widely. Many shared their surprise that they found out courses were bilingual after they were registered and in class on the first day. Some mentioned they found out about bilingual STEM courses through advisor counseling (see red thought bubble). It is important to note that currently, students are informed about course bilingual



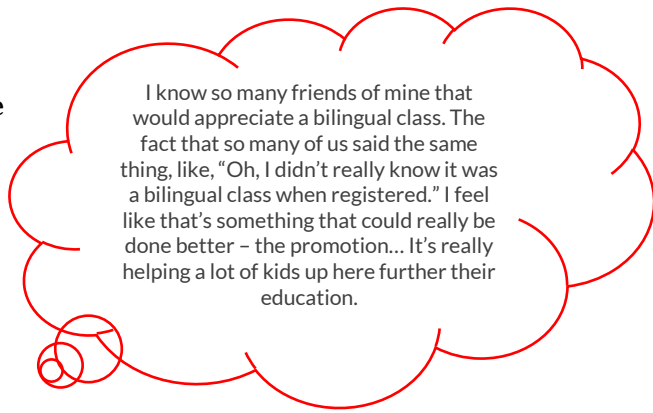
(Translator Speaking) He mentioned that for him, the use of Spanish in the class just made it easier for him to understand, but for other students who may not have advanced Spanish, it was an opportunity to have an experience with the second language, to expand the knowledge on that language and to help them after the university.



Two benefits from this [bilingual instruction], one is that it does expand your knowledge in the language, and two, if you don't understand one language you do have the next one to help you.



I thought, for me, in the beginning, I do get that we do understand both languages, if you understand English, if you understand Spanish, but I felt like it prolonged the kind to teach, right? You would go into one topic and then you have to do it again with the next language, so for us it was a bit of repetition, which is good, but then again, it prolongs the time of the lecture, that's how I felt at the beginning like somebody did say, it did flow later on in the semester, which was a good thing.



I know so many friends of mine that would appreciate a bilingual class. The fact that so many of us said the same thing, like, "Oh, I didn't really know it was a bilingual class when registered." I feel like that's something that could really be done better - the promotion... It's really helping a lot of kids up here further their education.

status after enrollment as part of the project’s research design and protocols for studying the benefits of bilingual/bicultural courses.

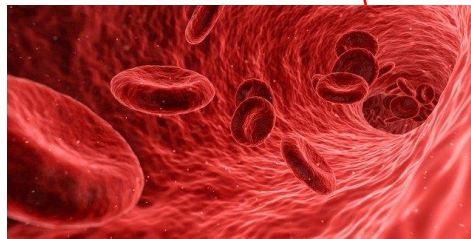
Real Life, Valley-Relevant Examples

Students across courses valued professors’ application of course concepts to their real, lived worlds. Professors made curriculum approachable through “cultural scaffolding,” i.e.,



“links between academic concepts and the experiences that are familiar to students” (Muniz, 2019). Several students mentioned professors’ use of Valley-specific “everyday” examples and being able to, for example, walk around town or the neighborhood and identify plant life or species they were learning about in class.

Students also found curriculum relevant when professors centered Valley-specific manifestations of or implications for classroom concepts under study. Sometimes this relevance came from examining social issues like health disparities in the Valley (see red thought bubbles).



Yeah, she mostly relates things to our lives. Her examples were like, “We’re going to put in a beaker in a test tube then you’re going to see it...” She would explain like, “When you’re cooking, this is going to happen to this, “ or like, “When you go outside, you see how this changes in this and this is what that means. This is how you can relate it to that”

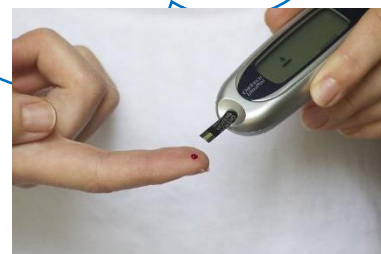
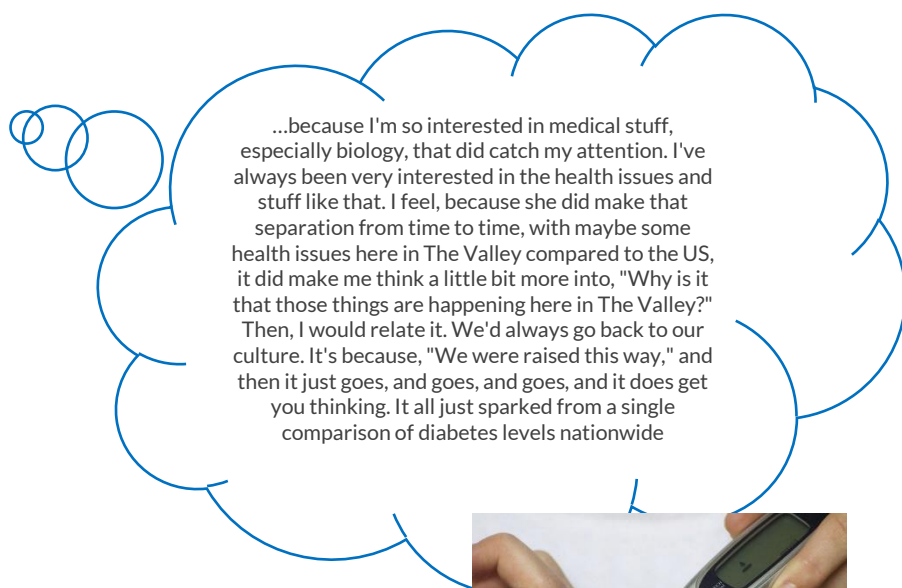
She would find some ways to engage us, for example, she would mention the Portuguese man-of-war or the jellyfish we would see at the island or the side tats that we would always see that’s really common in The Valley. She would point out those species and relate them to the area that’s around us. And it would work. Every time I would go outside, I would be like, “Wow. That’s the plant that she was talking about.” That’s not only in her class but in biology in general for UTRGV, in the labs, they would go to the island and they would take pictures of the green algae the brown algae

She would always relate the topic to whatever is going on, like certain trends. If it has to do with clogging of the arteries, she would relate that. That’s really common here, and it would result in heart attack, high percentage of diabetes here, and typical issues in The Valley. So she would kind of relate that, compared to El Paso where you really don’t have as much people with diabetes. She’s not going to focus on that as much as if she was teaching here in The Valley, so that’s how I feel she would relate to our culture in The Valley to what she was teaching.

Sociopolitical Consciousness

One of the tenets of culturally relevant pedagogy is helping students develop a sociopolitical consciousness to critique cultural norms, values, and mores. In the November 2020 student focus group, the facilitator asked students whether or not the class and the instructor welcomed them to think critically about the values in Valley culture or in US culture more broadly; to weigh fairness in communities. Students referenced the professor's willingness to talk about different iterations of Hispanic culture, discussions of power dynamics in higher education and making mistakes in college. When prompted to discuss injustices, a student offered that injustices didn't seem applicable in a chemistry course.

Chemistry course students' responses contrasted responses from students in bilingual courses. When asked about ways professors invited them to think critically about dominant US culture, students in the May 2021 focus group on bilingual course experiences touched on sociopolitical issues they explored when comparing rates of diabetes in the US with those in the Valley. One student specifically illustrated the critical questions the session sparked (see blue thought bubble).



Through a sampled, qualitative lens, students' value for the project is very good. Focus group students in fellows' classes relate positive engagement with course faculty and materials that draw on their homes, communities, cultures and languages. Students with bilingual experience and bilingual/bicultural identities are comfortable communicating in Spanish and English. Almost all self-selected students in bilingual and bicultural focus groups find courses both an asset and a valuable challenge. And those challenged noted that issues resolved with time. Students certainly pinpoint a sense of belonging coming from cultural relevance and openly shared about comfortable, positive interactions with faculty. Shared language enhanced comfort. Consistency of curriculum and instructional approaches is needed. Fellows are producing this. Student histories with formal and informal bilingual learning and/or Spanish language fluency might be an area for inquiry and tailored development.

What is the value of the project to faculty?

Almost all participating faculty see the *Building Capacity* project as at least a very good experience and the majority consider it to be excellent. Across their experiences, they gained the most from interactions with Valley community members and together, with one another, as they are building their community of practice.

When rating the quality of the professional development delivered by the NSF overall project on a five-point Likert scale from “inadequate” to “excellent,” 20/23 of the faculty rated the project highly with over half, 13/23 of the faculty rating the project as excellent. Figure 13 displays these ratings.

Figure 13. Frequency of Faculty Rating the NSF Project Overall

87% of participating faculty rated the professional development of the NSF project as **very good or excellent** overall.



Source. UTRGV NSF HSI, Faculty Survey, May 2021
Note. n = 23.

When asked to explain these positive ratings, faculty referenced the project's strong planning, (e.g., "organized," "goal-oriented," "well-planned,") and engagement with local community partners. Some faculty made generally positive comments about their personally impactful experiences (see red thought bubbles).

Faculty were asked to describe the professional development experiences with most significance to their learning about the language, culture and history of UTRGV students. 17/24 surveyed faculty responded to the open-ended question. Faculty responses ranged from general statements like, "meaningful" to detailed memories of workshops that involved specific community partners or activities like collaborative lesson planning. Of the 17 faculty respondents, six mentioned the value of engaging with community partners like ARISE and the Promotores in the Colonias, five mentioned the value of experience sharing with faculty and two mentioned the value of hearing student experiences. Three faculty spoke generally about what they valued. Two of the general statements referenced discussions. Three faculty members referenced the value of site visits explicitly ("site visits," "trips," "visit at"). Together, statements valuing engagement with community partners and the specific reference to site visits underscore the power of engaging with community partners "in place," beyond UTRGV walls. It should be noted that a couple of faculty members mentioned more than one stakeholder group (e.g., "students ['] warm heart toward Colonia community members", etc.) and some statements were coded twice as they referenced value for more than one experience (see Table 8).

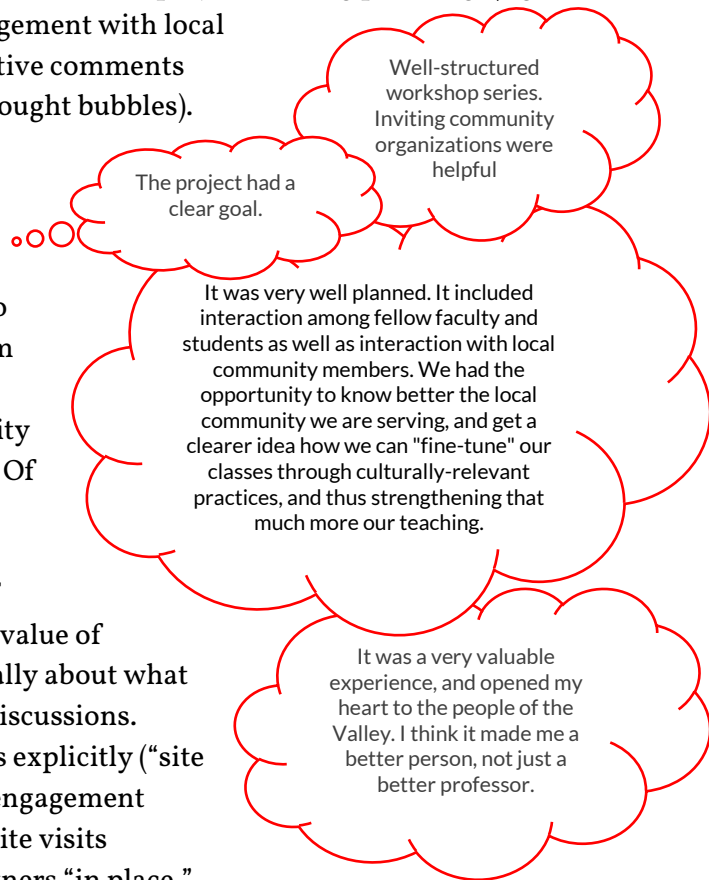
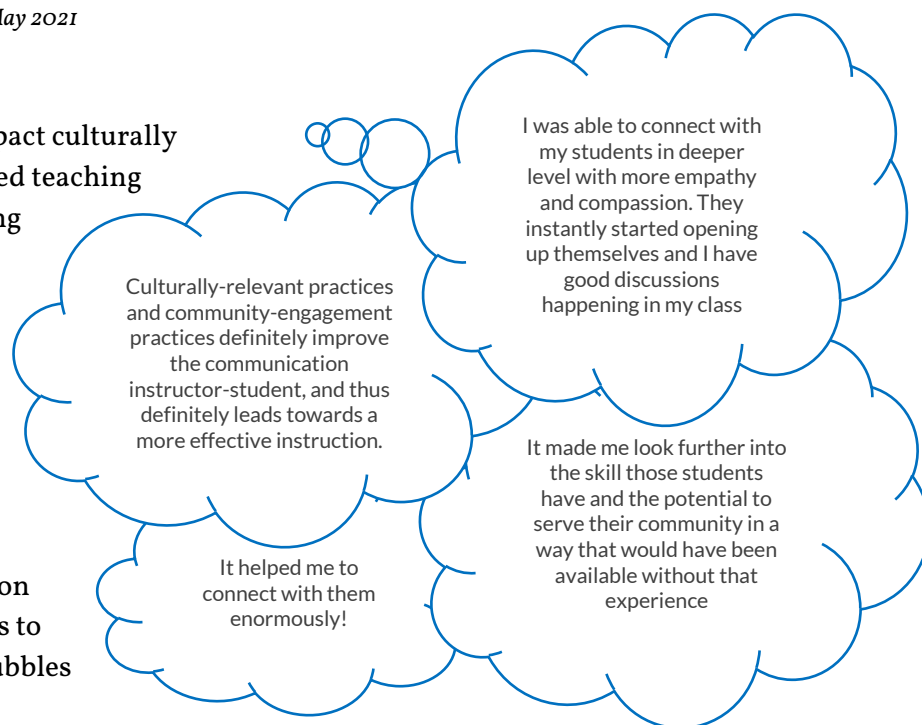


Table 8. Faculty PD Experiences Significant to Learning about Culture, Language & History

Engaging with Community Partners
The most significant workshops were those that engaged us with community partners like ARISE and LUPE, but I also believe that the trips to different locations (e.g., Quinta Mazatlan, San Carlos Development Center, the Conservation area close to Progreso, TX).
Listening to issues important to community partners and then writing lessons/projects with those community partners was meaningful.
Being able to lessen the community members and understand their perspective, passion and desire and also learn from them.
Meeting with the Promotores in the Colonias and hearing the stories about their lives and aspirations was especially moving to me. It really helped me understand the history and culture of the region.
The visit at the Proyecto San Juan was truly an eye opener. Most people think the Valley is an OK place and are not aware of the serious needs of the community we serve
Networking with local leaders: it is priceless!
Experience Sharing with Faculty Colleagues
Faculty sharing their experiences.
There many experiences in the workshop including meeting with fellow faculty with similar interest and concerns, as well as an opportunity learn more about the Rio Grande Valley (our local community).
When Dr. Guajardo explained about local Mexican culture, that helps me understand the students more.
I'm impacted by others' experiences and how they managed to obtain results applying diverse methods of instruction.
More insights about Culture of Valley, knowing my students background in different aspect, having connection with peers who think alike, support from peers. The experience was amazing and cannot explain how much it helped me. The best thing happened to me at UTRGV
Hearing Student Experiences
I saw students' interest and warm heart toward colonia community members, especially those with fluent Spanish skills.
listening to students participate and share experiences
Discussions
Some of the discussions lead to some learning but not all.
one on one conversations and culture relevant discussions
General
meaningful
Site Visits
site visits

Source. UTRGV NSF HSI, Faculty Survey, May 2021

And faculty sense the direct impact culturally relevant and community engaged teaching and learning practices are having on their interactions with students. When asked to describe ways COS-NSF workshops are shaping their connections with students, 16/24 faculty responded and 15 of their responses indicated a positive, connective impact on relationships and communication with students including changes to instruction. See blue thought bubbles for their words.



In summary, faculty value the project's work to facilitate their growing community of practice and networks with local community partners as they hone culturally relevant and community engaged learning experiences for students.

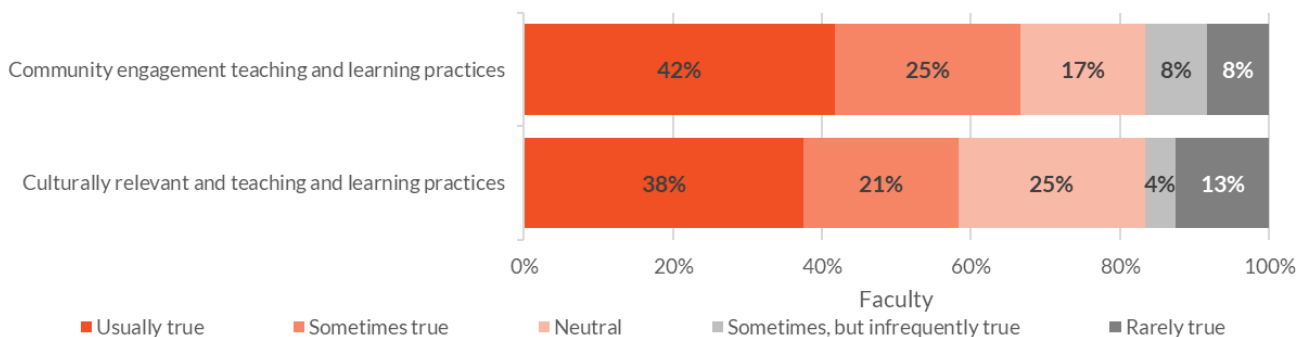
What is the value of the project to UTRGV administrators?

It is clear that most faculty feel encouraged to implement Culturally Relevant and Community Engaged teaching practices and most faculty feel this encouragement coming from students and departments.

To assess the value of the project to administrators, we looked closely at faculty responses to survey questions asking about departmental encouragement for using CR and CE teaching practices and sensed rewards for CR and CE teaching practices. Faculty were asked to rate the frequency of departmental encouragement for CR v. CE teaching practices using a five-point Likert scale from “rarely true” to “usually true”. Most faculty reported feeling department-level encouragement for CR (14/24) and CE (16/24) teaching practices at least sometimes. A large minority faculty reported that departmental encouragement of CR (10/24) and CE (8/24) teaching practices is neutral to rare. Figure 14 illustrates these results.

Figure 14. Frequency of Department Encouragement for Faculty CR & CE Teaching Practices

I am encouraged by my department to use....

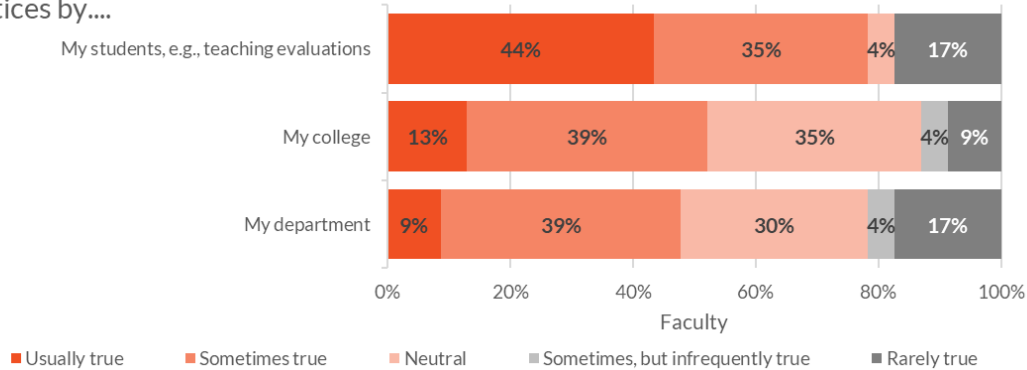


Source. UTRGV NSF HSI, Faculty Survey, May 2021
 Note. n = 24.

When asked about the source of rewards for CR and CE teaching practices, of responding faculty (18/23) reported that they receive rewards from students at least sometimes. This reward from students came from mechanisms like teaching evaluations and was substantially greater than sensed rewards from the college or department. Almost half (11/23) faculty reported neutral to rare rewards from their colleges and about half faculty (12/23) reported neutral to rare rewards from department structures. Figure 15 bears this out.

Figure 15. Frequency for Sources of Rewards for Faculty CR and CE Teaching Practices

I am rewarded for using culturally relevant teaching and learning practices by....



Source. UTRGV NSF HSI, Faculty Survey, May 2021

Note. n = 23.

This difference between sensed rewards from students and sensed rewards from administration seems significant alongside 42% and 33% of faculty reporting rare and neutral department encouragement of CR and CE teaching practices. This is a place to grow. Faculty must receive and sense support for a classroom level diversity, equity and inclusion initiative like this one to thrive and sustain itself (Takayama, Kaplan, Cook-Sather, 2017). This implies a need to strengthen pre-existing or develop new administrative and infrastructural policies and rewards for this work if culturally responsive, community engaged teaching practices are meant to spread, strengthen and become an essential part of the university's reputation as a Hispanic Serving Institution.

I do not notice any opposition to incorporating culturally relevant teaching and learning practices, but I'm not totally sure I am encouraged. I can say I am supported more so than encouraged. For example, I don't hear anyone saying, "do culturally relevant teaching and learning" but I can say that no one that I know has criticized culturally relevant teaching and learning that I know of.

There is no official policy in place in department and college

The topic of culturally relevant teaching is rarely brought up during faculty meetings

If I took the time to publicize my culturally relevant teaching work beyond the classroom, then I could definitely garner a "good job!" from the department and college, maybe more. Students sometimes express thanks for cultural relevance, that is a kind of reward.

What are the learnings that can be applied going forward? What barriers and enablers made the difference between successful and disappointing implementation and outcomes?

Looking back from the end of the road is a metaphor for reflecting on what happened so that leaders and team members can make plans for next steps. Thinking about the past in terms of “lessons learned” highlights knowledge gained through experience. After three years of delivering the *UTRGV Building Capacity* project to 27 faculty, the project team and participating faculty have amassed knowledge and experience. A tool for analyzing mechanisms that influence the outcomes is to consider barriers and enablers. The faculty survey included specific questions about perceived rewards for implementing CR and CE teaching practices, motivations to participation in the project and barriers to implementing CR and CE teaching practices. The project team survey polled the PI, Co-PIs, and the Project Coordinator to consolidate their knowledge gained. New Co-PIs who joined the project in the last year may be surveyed in Years 4 and 5. Enablers and barriers referenced by students are integrated when relevant. It is important to note that students in the culturally relevant chemistry section were unable to identify barriers. (See the section *What is the value of the project to students?* for further discussion).

Enablers of Successful Outcomes

This project is enabled by faculty strongly motivated by a desire to develop teaching practice that fosters student-faculty connections, the continuity in project team leadership amidst and despite turnover in project leadership, and diverse representation in participating faculty and project team work including community organizations.

It is clear that participating faculty are eager to support student STEM success and do so through on-going professional development. When asked to explain their motivation to participate in the COS-NSF Transforming Undergraduate Education in STEM professional development program, 17 faculty reported a range of motivations from scholarly research and the importance of strengthening STEM diversity in general to personal desires to improve teaching practices and connect to students. Improving teaching practices and centering students in that work were the most frequent motivators faculty described. One faculty member mentioned the stipend (see Table 9 for patterns and individual motivations).

Table 9. Faculty’s Motivations to Participate in COS-NSF Transforming STEM Ed PD

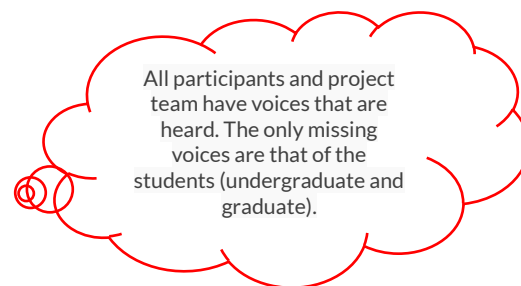
Desire to Improve Teaching Practices and Reach Students
I would like to improve my teaching and I understand more about my students.
I was seeking support for community-engaged teaching. Also, the stipend
Wanted to learn more pedagogical techniques, learn more about RGV
My desire to learn more about CESL course and encouragement from college.
Initially, it sounds like a great opportunity to incorporate new teaching strategies and a great experience for my students to contribute and learn from their communities.
I just applied for my own professional development area.
improve my teaching
Strengthen Connections to Students (and/or Community)
to have a better understanding of our students and co-workers
I strongly belief in the importance of those activities of relating students to their community
To serve the students in a better way
helping my students
Support and Increase (STEM) Cultural Diversity
New meaning and understanding of culture and new beginning
I am committed to diversifying the geosciences.
I am convinced that teaching and preparing our students is fundamental task for our University, and preparing our STEM college students a fundamental task for our College. The COS-NSF workshop made significant step towards planning and implementing culturally-relevant practices throughout the College courses; and therefore the COS-NSF helped implement steps to make the STEM instruction at UTRGV that much stronger.
Research / Project Development
I am aiming to further my research in the area.
Multiple efforts to get educational projects funded.
Invitation
One of the Co-PI's visited my office and he discussed what was being done with this grant. Our frequent conversations led me to commit to being engaged in this project.

Source. UTRGV NSF HSI, Faculty Survey, May 2021

The project team survey reveals that while the project team has experienced recent turnover in Co-PIs, the PI, experienced Co-PI and Project Coordinator are navigating these transitions; working to integrate new Co-PIs into the project while participating and organizing on-going activities for faculty. One team member related an appreciation for the efficient use of faculty-members’ time (see blue thought bubble). Continuity of leadership and coordination are facilitating this project’s moves through high turnover and a pandemic.



When asked about group dynamics and representation, all responding members of the project team affirmed diverse representation of faculty and project team voices. The project team pinpointed the need to move toward integrating more



student voice going forward. See red thought bubble for a representative quote.

Barriers to Success

Some of the barriers to this project’s work include the challenge of fostering comfort with Spanish language as an asset to STEM teaching and learning, the time needed to enact relevant, engaged teaching and learning practices, the on-going institutionalization of an initiative focused on classroom and community teaching, and turnover in project leadership.

When asked to explain barriers to culturally relevant teaching practices, 17 faculty responded. Six out of 17 faculty offered that they did not experience any barriers to CR teaching practices. Five out of 17 pointed to lack of shared language as a barrier. Three out of 17 pinpointed time as a barrier. One faculty member suggested course release to defray the time expenditure. Table 10 conveys these patterns along with barriers experienced by individual faculty.

Table 10. Barriers to Culturally Relevant Teaching Practices

No Barriers
none
none so far because I incorporate my self to it
Nothing really yet
NA
None that I know of.
None. I have that that students at UTRGV are typically very receptive and appreciative of a culturally relevant approach. Fellow faculty tend to be neutral on this point with some faculty openly supportive. As with a the faculty, the administration has also tended to be neutral with some openly supportive. So far, in my experience, I happily never found strong barriers; and with programs like the COS-NSF I expect to find more support from faculty and administration in the future.
Language
Before this, lack of training. Worry that trying to speak en Espanol when I am not fluent would be judged, not understanding that instead it is appreciated.
language
Lack of common second language
Language was.
I am not from here nor do I speak spanish
Time
time limit
Time and effort are significant. More teaching-release for this work would help
It demands more time that goes into the preparation for each class.
Misconception/Miscommunication
I asked one of my students in my spring 2021 class as which country you are from and what language you speak and I was in trouble and I apologized my student. Student felt embraced. So this made me to think how can I get their culture without asking anything.
COVID
The Covid pandemic has been a problem because I don't feel comfortable having my students go to the community to do culturally relevant projects which I did prior to the pandemic.
Low Course Enrollment
Low enrollment and student participation.

While students related some challenges with the time commitment for bilingual learning, particularly for students in earlier stages of language fluency, students also noted resolution and benefits to the challenge as they move toward careers and graduate education. While language differences can feel like a barrier when language is not shared, language is clearly both a barrier *and* an enabler.

Coupled with a glimpse at qualitative data gathered from self-selecting students in faculty fellows' courses, it is worth considering the weight and possibilities within shared language. Students in bilingual sections related the strong sense of comfort that came in sharing language with faculty members. While this confirms some faculty members' sense of the barriers when experiencing language differences, it also underscores the potential bridges for faculty open to developing Spanish language fluency. It may also hint at decision-points as this project moves into Years 4 and 5. How will the project tailor language awareness or exploration for the rising percentage of non- or slightly Spanish fluent faculty members as this project moves to scale? Five out of 11 faculty in Cohort 1 gauged themselves as having zero to slight fluency in Spanish compared to 8/11 in Cohort 2.

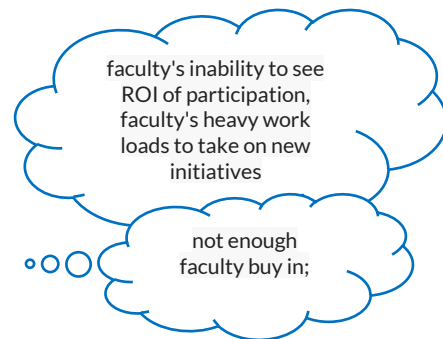
When asked to explain the barriers to community engaged teaching practices, 17 faculty responded. Eight out of 17 faculty conveyed that there are no barriers at UTRGV. One faculty member who did not see current barriers previewed the future need for faculty and administrative support to sustain community engaged teaching practices. Three out of 17 faculty noted challenges engaging with the community due to the COVID-19 pandemic and revised protocols for social interactions. Two out of 17 faculty repeated time as a barrier. 1 faculty member describes some challenges integrating community engaged teaching practices into a more conventional model of teaching and learning. Table 11 conveys these patterns along with barriers experienced by individuals.

Table II. Barriers to Community Engaged Teaching Practices

No Barriers
None.
None
None
Nothing really yet
NA
NA
No barrier.
As with the culturally-relevant teaching approach, I have not found any significant barriers with community-engagement. That said, with programs like the COS-NSF I expect to find more support from faculty and administration in the future for community-engagement practices.
COVID
Right now, COVID. I look forward to trying more in the future.
I did not practice this because we had only online classes because of Covid.
None other than the pandemic halting what can be done.
Time
time limit
Time and effort are significant. More teaching-release for this work would help
Scheduling
It is hard to accommodate the course in my teaching schedule since the department needs me to teach other courses with higher demand and large size courses.
Language
Finding the correct projects for the correct students and lack of Spanish language and local culture made a hinderance for me to converse with the community members who preferred to speak to those who speak their language, that is I was singled out to great extent.
Curriculum/Course Design Challenges
Coordinating different pieces of course activity, which were different from conventional lecture or lab sections.
Community Connections
Finding community partners

Source. UTRGV NSF HSI, Faculty Survey, May 2021

Project team survey results convey some concern about maintaining faculty buy-in to the work of culturally relevant and community engaged teaching and learning. When asked to identify top threats and opportunities within the project, two of the three responding project team members identified these concerns (see blue thought bubbles for their words).



Strong positive ratings from the faculty survey around the COS-NSF workshops do not mirror the project team’s concern about faculty buy-in. However, given that some faculty noted time as a barrier and one project team member mentioned faculty workload,

structures that make and maintain time for the CR and CE community of practice will be essential to sustain the project's progress building capacity in faculty that translate to student STEM success.

Key Findings and Implications

The team is delivering powerful faculty professional development and is adapting the professional development to address emerging and on-going faculty professional development needs. The move to delivering on site workshops “in place” in Valley communities beyond university walls is having a positive impact on faculty members and may be a powerful tool as the program continues to expand and reach a wider range of increasingly diverse faculty members with a range of Spanish-language and Valley-life experiences.

There is a diverse array of faculty deeply invested in this project’s goals of developing and enacting CR and CE curriculum and instruction across STEM courses with positive student relationships at the core. Given the broad array of faculty members’ lived experiences in and beyond the Valley, there is and will continue to be a range of outcomes for faculty. The team should continue its strategic, data-based adaptations as it tailors workshop design for this diverse, committed, emerging community of practice. We wonder about the ways the team might identify and draw on pre-existing, small groups of faculty (e.g., micro-communities of practice), foster mentorships, scaffold student participation, or strengthen the sense of community through interdisciplinary or interdepartmental exchanges. This work requires patience, strategy, and time – all resources the team has been exhibiting across the timeline of this project and amidst a rapidly changing environment.

Language is a powerful enabler across this project’s processes and outcomes and a key part of the team’s strategy. It also emerged as a barrier for some students and faculty. As the faculty cohort diversifies and bilingual courses expand, it will be important to draw on a broad array of institutional resources within and beyond the project to leverage and sustain the power of language as a cultural asset across STEM courses.

Faculty fellows enacted culturally relevant and community engaged curriculum and instruction that resonated with students. As the project scales in years four and five, these faculty and other surveyed faculty with long-time CR and CE skills will have a powerful role to play as models, mentors, or collaborative researchers with colleagues diving deeper into CR and CE curriculum implementation and evaluation.

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