Professional Development for Culturally Responsive Teaching: A Case Study of an Indigenous Teacher in an Indigenous Space

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Abstract: Our research explored an in-service professional development (PD) program that was iteratively co-designed with educators at a rural school on the Big Island of Hawaii. Many Hawaiian schools are highly ruralized and demonstrate a dire need for meaningful PD in science, technology, engineering, and mathematics (STEM). Due to geographic and community considerations, in-service PD is an essential tool for improving education in low-income, rural communities. This confluence of considerations demands focus on supportive and effective training for rural and highly ruralized teachers. We situate this work in Ginsberg and Wlodkowski's (2012) motivational framework for culturally responsive teaching which considers the conditions of attitude, meaning, competence, and inclusion. This paper examines the experiences of an Indigenous teacher with over 30 years of experience as she engages in PD that centers her Hawaiian community.

Introduction

It is often challenging to recruit and retain non-local teachers to rural schools, because of their remote locations. Further, teachers in rural schools are most likely to spend their entire teaching careers at their first district—prospectively teaching multiple generations of students from their community (Cowen et al., 2012). The more highly ruralized the school, the more robust these trends become. As such, hiring and firing strategies cannot be used effectively to sustain improvement of classroom instruction due to the small pool of prospective applicants (Barrett et al., 2015). Thus, in-service professional development (PD) provides a singular and essential tool for improving educational opportunities for low-income, rural communities. This confluence of considerations demands focus on developing effective training for rural and highly ruralized teachers.

Many Hawaiian schools are highly ruralized with a dire need for meaningful PD for STEM teachers. The Hawaii Department of Education reports a shortage of STEM teachers across the islands (U.S. Department of Education Title II Database, 2018), and less than half of one percent of new teachers in Hawaii are hired to teach computer science (Hawaii Department of Education, 2017). This lack of trained CS teachers is a growing problem in Hawaii since the state adopted computer science education standards statewide several years ago. As a further challenge, most educational standards, curricula, pedagogical, and professional development models used in the state are imported from the mainland and often do not reflect the culture or perspective of Indigenous Hawaiians. Within this context, there is an evident and urgent need for culturally responsive, geographically meaningful STEM+C learning across Hawaii.

Within a larger research practice partnership (RPP) on the Big Island of Hawaii, we explore the case of one Indigenous teacher, Mila. With over 30 years of experience in teaching, Mila was considered across the school as a leader and trusted community member. Having participated in a scaffolded teacher PD model in the summer of 2022, and again in 2023 as a master teacher, Mila offered insights into both the affordances of the PD model and the needs of the community she stewards. We inquired into her experiences to understand her perspectives on culturally responsive and Hawaiian-centered PD on teaching integrated STEM+C content. We situated our work in Ginsberg and Wlodkowski's (2012) motivational framework for culturally responsive teaching which considers the conditions of attitude, meaning, competence, and inclusion. Using a case study approach (Yin, 2013), we ask: How does scaffolded professional learning support the teaching practice of an Indigenous teacher as she learns to develop and teach culturally responsive, community-centered projects?

Background

The motivational framework for culturally responsive teaching constructed by Ginsberg and Wlodkowski (2012) describes how attitude, meaning, competence, and inclusion work together to enhance the experiences of learners. Within this framework, culture is defined as the intersection of language, values, beliefs, behaviors, and experiences that shape an individual's sense of who they are and how they interact with others. From this lens, culture is not something that can be isolated as a distinct phenomenon, and the study of culture is highly interpretive. This motivational framework for culturally responsive teaching supports understanding the

pedagogical ecology around attitude, meaning, competence, and inclusion. It poses a question for educators to reflect on for each of these four tenets. For example, one tenet in the framework is positive attitude, which encompasses personal relevance and volition or the ability to make choices. Here, Ginsberg and Wlodkowski (2012) focus on how instructional design affirms students' favorable interest towards their learning. They suggest that when material is both personally relevant and the environment allows students to make choices, they will be more likely to have a positive attitude. Another tenet of the framework is the concept of meaning. They propose that learning experiences which are challenging and engage perspectives of value to participants generate more meaningful opportunities to learn. This framework for culturally responsive teaching suggests that attitude, meaning, competence, and inclusion are practices that work in concert to support learners' sense making and to construct a learning environment culture that is shared by all learners.

In addition to Ginsberg and Wlodkowski's (2012) framework for culturally competent teaching, our research is situated in culturally responsive pedagogy. In culturally responsive classrooms, students' cultural practices, languages, and ways of knowing are resources for multidirectional learning (Ladson-Billings, 1995). Within a culturally responsive learning environment, teachers learn from students, students learn from teachers, peer to peer learning occurs and communities are positioned as rich and meaningful contexts for inquiry (Ladson-Billings, 1995). Culturally responsive computing (Eglash et al., 2013; Scott et al., 2015) focuses on connecting computing content with heritage practices that are culturally reflective of students' backgrounds and community practices (Eglash, 2007; Eglash et al., 2006). Culturally responsive computational making transcends the screen to the realm of physical computing with the goal of designing objects and learning opportunities that improve educational experiences and meet community needs. It also leverages community-based craft practices, recognizing that Indigenous peoples were makers before the maker movement became popular (Kawagley, 1995; Vossoughi et al., 2015). To create a culturally responsive classroom is a continual process during which teachers must make a variety of considerations about their students, colleagues, and environment.

In our research context, we consider the motivational conditions of attitude, meaning, competence, and inclusion as exemplified by our interpretations of the experiences of a teacher, Mila, as a result of participating in PD intended to support culturally responsive computing. While Ginsberg and Wlodkowski's (2012) framework was constructed for use by teachers in designing adult learning, it is also well-suited to our research of teachers who are learning during PD. We situate our work in the notion that our learners, the teachers in this research context, are intrinsically motivated people who are shaping their knowledge through a variety of internal and socio-cultural processes. Further, we designed instruction with and for these teachers, and as such the framework is a complement to this work. Lastly, the four-part framework will be used to described our research context and how the teacher expressed her experiences of respect and connectedness, choice and learning, authenticity and effectiveness, and challenge and engagement – the ecological aspects of the framework.

Context and methods

Our research partners are educators and community members from Nui Huna Middle School (NHMS) on the Big Island of Hawaii. The town of Nui Huna represents the diverse populations of Hawaii. In particular, we interacted with students and educators at NHMS, who each bring their unique histories and experiences. Within this school community, students and teachers self-identify as part of many groups including Indigenous Hawaiian, Filipino American, Japanese American, Marshallese, Portuguese American, and Latinx. In this community, we note some shared experiences of exclusion for Indigenous Hawaiians related to STEM. Specifically, for many locals to the area, their Hawaiian culture and meaning making are not typically welcomed into science and scientific practice in the area and more generally (Tofel-Grehl, 2023). This is exemplified by the presences of two large science corporations on the Big Island that base their research and work in areas such as Mauna Kea, the tallest volcanic island on Earth. Mauna Kea is a site of deep importance and significance to Indigenous Hawaiians as it is the location of an origin story and sacred ground for Indigenous Hawaiians. There continue to be tensions between the communities of science and the Indigenous Hawaiians (Maly & Maly, 2021). Moreover, both Indigenous students and teachers view science as unimportant, disinteresting and disconnected from local context. Teachers view science learning as "from the mainland" (p. 1896) while a student reflected that "I do it, because I have to in school, not because I want to." (Tofel-Grehl, 2023, p. 1897). Therefore, in this context we take an approach founded on cultural connections to science by co-designing in-service PD for STEM+C teaching that is centered on meaningful, locally-relevant activities that are inclusive of community identities We worked in partnership with NHMS educators to iteratively create an in-service PD that informs STEM+C teaching in the classroom. Our

partnership work strives to co-create teaching practices and a professional learning community that is more aware of and centered around culture while integrating existing strengths and knowledge held by the educators we work with.

Research practice partnership

Our eight-year research practice partnership (RPP) with Nui Huna Middle School sits at the core of this research. A public middle school serving 6-8th grade students in rural big island Hawaii, NHMS's mission is to support and foster Hawaiian culture, community, and language within the school and across the community. The NHMS mission statement[1] described their aim to share values, practice, and cultural awareness with their students to become empowered learners and community members. To realize this mission, the NHMS leadership connected with our educational team as a way forwards to create programs and learning for educators and students while bridging connections to students' families and local community members. The collaboratively established core values of our RPP center the idea that learning should be consequential (Hall & Jurow, 2015) and student rightful presence (Calabrese Barton & Tan, 2019; Tedesco & Bagelman, 2017) is essential for the school community. We situate the problem of practice within our partnership as determining what Hawaiian centered learning and teaching can look like within and across the school community when it centers consequentiality and rightful presence.

Job embedded education

Our research explored an in-service PD program that was iteratively co-designed with NHMS educators. In particular, we worked to create meaningful learning using a variety of modes for teachers to gain further experience with culturally responsive and Hawaiian-centered pedagogy. Beginning in 2020, we worked with the NHMS educators to create a three-part PD that included online professional development, a face-to-face workshop facilitated by our research team and an embedded PD initiative where teachers cotaught with fellow teachers and research team members to scaffold and support their teaching practice in ways that integrated culturally responsive pedagogy with STEM+C. In addition, we provided teachers with classroom materials to support their work during all phases of the PD and ongoing support. Below we offer a brief overview of the instructional model of the PD that included online, in-person, embedded, and ongoing learning scaffolded by the research team.

Online professional development

The PD included a self-paced online course with 5 modules that took approximately 6-10 hours to complete. The online PD material covered topics such as culturally responsive teaching, science and circuitry, and computing. Each module contained learning materials in the form of written or video resources and activities in the form of assignments, discussion posts, or surveys. The course encouraged teachers to gain competencies in their application of learning, expressiveness, intellectual development, and lifelong learning. This portion of the professional learning was intentionally engaged virtually to allow teachers private time to reflect on their identities and the identities of their students.

In-person professional development

Two days of in-person training focused on scaffolding constructionism-based projects and app building. Having explored paper circuits during the first stage of the professional development online, teachers focused on coding and applying the culturally responsive computing strategies previously introduced. During this portion of the PD, we engaged in co-design with each teacher to hone and develop the teaching unit they would be instructing in the following portion of the professional development. As an example, Mila created an app-building course where students would observe and document local plant life that integrated local Indigenous Hawaiian knowledge and practices.

Embedded professional learning

During the summer school program master and novice teachers co-led STEM+C classes. Novice teachers were paired either with a master teacher who had completed the PD sequence previously or a research team member. During the summer teaching, master teachers or research team members taught the first period of the day. In the second period, both the novice teacher and the master teacher/research team member co-taught together. Then, in the third period the novice teacher would lead class instruction while the master teacher or research team

member offered support. This allowed teachers multiple scaffolds for implementing and improving their professional practices within a classroom. The summer school space offered the unique affordance of not being a tested space, which allowed educators to explore novel teaching techniques in a less high stakes space.

<u>Ongoing support</u>

After completing the three discrete phases of professional learning, teachers then taught the same or similar projects within their classrooms during the school year. Teachers participated in regular virtual meetings to scaffold professional learning and receive support from the professional learning community of researchers and fellow educators engaged in this work. Here, the teachers and research team members shared progress or updates on past and ongoing instruction or posed questions to the group for support.

Case study

Mila, who is the focus of this case study, constructed her understanding of the PD learning and connected this to her identity as an Indigenous Hawaiian who is passionate about sharing cultural knowledge with students regardless of their background. She was selected as the case for this research because of her extensive teaching experience (~30 years) and her articulation on the importance of culturally responsive and Hawaiian-centered teachers. Other educators in this context echoed this sentiment through the years of the RPP. However, Mila was individually selected because of her role as a master teacher in the 2023 summer school and to provide a deeper analysis of the ways an Indigenous teacher experiences a program that focused on culturally responsive and Hawaiian-centered pedagogy.

We analyzed one-on-one, in-depth interviews to understand the essence of an experience bound with a specific time and place (Yin, 2013). Mila is a 7th grade science teacher with an Indigenous identity from the local community. She was born on the Big Island and has lived within the community she teaches for her whole adult life. Her *ohana* (family) ties to the community span generations and she sees herself as "everyone's auntie." Within Hawaiian communities, "auntie" and "uncle" are the terms of respect and connection bestowed upon community elders or folks to whom respect should be conveyed. Mila's status as "everyone's auntie" speaks to her beloved status in the community. Mila worked with the summer school previously in e-textiles on a quilt square-making project alongside one of the researchers as her mentor. This year (2023), Mila led students in making phone apps about various plants indigenous to the Big Island as part of her community biology class. Using block code, students engaged in sharing information about local plants and their historic uses within Indigenous Hawaiian communities. Mila engaged with the summer school in a variety of ways, moving from novice coding teacher to a master teacher in 2023 who helped scaffold and support another teacher in developing these skills. We explore Mila's experiences and reflections to understand more broadly how teachers' perceptions of different groups of students can be both implicated by and inform the design of learning and the experiences of those involved.

We conducted semi-structured interviews throughout the second-year of the summer school with Mila. These interviews were audio recorded and transcribed for analysis. We conducted initial and focused coding phases to synthesize our interpretations and results. First, we used descriptive codes to assign data with labels using basic description (Saldaña & Omasta, 2016) and the same segment of data could be coded with more than one meaning. For example, the code 'open communication' was used to describe the following utterance when Mila stated "just keeping those open lines of communication is the main thing to support a new teacher" (Interview, 6/22/23). We input initial codes through line-by-line analysis of the transcripts, and coded segments ranged from a sentence to a paragraph. For example, Mila described how the summer school app was connected to culture as "these are the plants and things that are in our community or it's in our culture. So everything goes back to the culture". A descriptive code titled 'culture' was generated and used across subsequent data as applicable. Finally, we conducted axial coding which aims to sort, compare, and classify the initial codes we compiled (Saldaña & Omasta, 2016). During this focused stage of coding, we revised and reworded tentative codes constructed at the initial stage, and we categorized all codes in conjuncture with our conceptual framework. For example, codes labelled as 'culture' were integrated into the 'establish inclusion' category. We continued with focused coding until initial codes were integrated into the categories of promote positive attitude, enhance meaning, engender competence, and establish inclusion to align with the framework for culturally responsive teaching (Ginsberg & Wlodkowski, 2012). Lastly, we constructed the high-level category of scaffolds and professional community as we drew together our interpretations and sense-making.

Findings

Scaffolds

Promote positive attitude

Meaningful choices that promote personal relevance are a dimension of building a positive attitude towards culturally responsive teaching (Ginsberg & Wlodkowski, 2012). This aligns with the design approach for both Mila's professional learning and curricular projects. As designers, we intentionally focused on providing teachers with opportunities to make personal meaning through localized relevance. Mila, exploring the relationship between her engagement with the PD and her storytelling in the classroom, noted:

> I started to do it last year, it took all the class all year long and then we brought it forward here to build relationships between each other in the class, the seventh-grade teachers and their *aina* [connection to all living things], and their whole thought… it's making relationships and going back to *aina*… And it's not just a place, it's the heart of your family. That's you, your mother, your father, your family, the land. It's because we take care of it, it takes care of you. And so, when I tell stories and all that, I have to be very passionate and deep reach to everything. And so, it was great to see that the kids make connections (Interview, 9/14/2023).

Mila's sense of being connected to all living things (*aina*) is something on which she centers her teaching practice. In particular, Mila experienced personal relevance when she observed her students learning and making connections to the classroom activities. Over the past year, she brought in the concept of *aina* as a value for her students to build relationships and to guide her teaching practice. Regardless of the student's background, Mila expressed personal meaning when seeing them make connections with each other and to culture. Mila described her reaction to the experiences of some students from the mainland as "they're feeling included. And they love learning about the different culture, different background and all that. So, I'm glad for that" (Interview, 6/22/2023). The PD was an opportunity for Mila to find personal relevance in her learning—in particular her *aina* as an Indigenous person that integrated connection to living things into her teaching practice. Mila felt positively about her culturally responsive practice and its impacts on students' connection-making and engagement for students of all cultural backgrounds.

Enhance meaning

Engaging in challenging learning is way to enhance meaningful learning (Ginsberg & Wlodkowski, 2012). Mila expressed her initial hesitation with the PD, because she did not think of herself as "well-versed in technology" (Interview, 6/22/2023). She described her experience:

> I really enjoyed this year what I had to teach. I was stressed at first because I was like, 'I have to do what? Make an app?' Like I thought I just finally got what we did in the summer and I was trying to, you know, lay it out throughout the school year, which was, you know, a little bit difficult putting in some of the components... but, I was a little bit stressed about it going, 'oh my God'. Cuz I don't always think of myself as, you know, somebody who's well-versed in technology. I've done a lot of different technology and programs, but if I don't like do it all the time, it's like, you know, 'poof' kind of be gone… but once I got into checking it out, it was cool and it was fun and, and I really liked it... things went well (Interview, 6/22/2023).

Despite the challenge of learning in a topic with which she is not comfortable, Mila expressed a shift in her feelings. She learned through the challenges of the PD and, importantly, connected the content with her longstanding teaching practices in the classroom. Additionally, Mila overcame challenging moments when she worked alongside another teacher in the PD. Mila described:

> How do I start it when it's just me? Sometimes it's overwhelming and I don't have a partner to kind of do it. I think that's why this year is a little bit better for the project because it's the second time and now me and [my novice teacher] can bounce off and "how did this work and what was your idea on this part?" And then we can give each other ideas because we're both familiar with the circuit thing and then the quilt part, you know what I mean? So that makes it much better to incorporate what we learn in there because we have someone else to talk to and to figure things out (Interview, 6/22/2023).

The multiple modes of the PD, such as instructing alongside another teacher during the embedded professional learning, enhanced meaning-making for Mila. She and her novice teacher brought their values and perspectives to the experience of co-teaching on a project. Mila was able to ask questions in an authentic setting and make deep meaning of learning at the intersection of culture and STEM+C instruction and projects in an Indigenous space.

Engender competence

Authenticity and effectiveness are central to engendering competence, or having participants recognize that their learning is occurring and is applicable to the real world (Ginsberg & Wlodkowski, 2012). Mila compared her learning alongside fellow educators during the RPP to how she experiences Hawaiian community relationships. She explained:

> This has worked a little bit better this year because we are a little bit more comfortable, we work together … We all help each other... We have to do that… and that's why I keep saying we got to build these good relationships with each other so it carries over into everything. And that's Hawaiians, that's how it was back in the day... everybody has to have that relationship within the community because you all depend on each other for survival, right? If there's no fish right now, because something's happening in the ocean, I got to go check out the guys up the hill who has ... so that my family doesn't starve and vice versa. Same thing. You talk about that in class, the school around, why it's important for us to take care of everything outside (Interview, 9/14/2023).

The learning environment of the PD was authentic to the real world and applicable to her teaching style for Mila. Mila discussed how learning about equitable approaches to teaching practices is often something "when we think about it, sometimes we only think in the special education realm" (Interview, 6/22/2023). However, she became more aware of how new perspectives on diversity and respect scaffolded her interactions with all of her students. Mila explained:

> And so, I kind of bring in stuff that was talking about diversity and respecting the different diverse backgrounds. So which kind of comes back to our whole culture thing because in Hawaii you have to be accepting of everybody. Everybody was, and then things change because other entities come in and stuff happens, but we want [students] all to feel included no matter where they come from, their background differences (Interview, 6/22/2023).

She engendered competence, or had an authentic learning experience, as she learnt more awareness and consciousness towards students' diversity and respectfulness of their different identities or experiences. Mila connected her learning and practice during the PD to Hawaiian the cultural values and history of acceptance towards difference.

Professional learning community

Establish inclusion

To establish inclusion, the learning environment fosters a sense of respect and connection amongst the community of learners (Ginsberg & Wlodkowski, 2012). Mila reflected on the PD as a shared experience amongst herself and other educators. She stated "now we all have this common thing and it makes it better because now like, that relationship is stronger and it's going to carry over to the kids and who wins? The kids" (Interview, 9/14/2023). She also described her relationship to her novice teacher and the practices they generate together in the space. The collaborative and conversational nature of Mila's work with her novice teacher created time for them to plan lessons or reflect on success and challenges. She explained:

> It was nice to be able to sit and talk with her and bounce off ideas and find out what she thinks from a different perspective because she's new. And "what would do you think would make it easier?" Because for her being new, she might find a different way of doing things that might be easier (Interview, 6/22/2023).

Mila respected the different perspectives and experiences of her novice teacher as a way for them both the create new ideas and ways of doing things in the classroom. Mila explained, "she's younger, so she might relate to the kids a little bit more what she thinks would work better. Yeah, but I like doing it with someone else and not just me, you know?" (Interview, 6/22/2023). Both Mila and the novice teacher integrated their own unique values, beliefs, behaviors, and experiences as they built practices in STEM+C teaching together. The relationship with her novice teacher allowed Mila more enjoyment in the summer school and opportunities to create ways to teach that would not have been possible without the shared experience. Though Mila found it helpful to collaborate on ideas with her novice teachers, it was at times challenging to allow someone else to take the lead. Mila described "it's just remembering to kind of give up the reins every so often, right? So that she can get the experience… And just to remember, I gotta step back a little bit more" (Interview, 6/22/2023). Mila often found herself trying to take the lead with instructing students or solving a technology problem. She recognized allowing her novice teacher to take the lead would be a more meaningful way for her to add to her own experiences and learning. Mila expressed how relationships in the professional learning community are built on comfort and openness as she described working with her novice teacher:

> I think the main thing is just making the other teacher feel comfortable, feel that they can ask questions or give suggestions. Making sure that I have things kind of set and laid out so they can look at it. Because I know when, if I have to get up there for instance and teach the second session and I'm watching the first session, but we never talked about it, that's stressful because then you're trying to take all these notes of what the teacher is doing because you have to do it on the second session (Interview, 6/22/2023).

Mila described the way open discussions before a lesson builds connectedness, increase transparency, and reduces stress. She further explained how reflecting through conversation with her novice teacher was a way to share in the co-development of their teaching practices. She described their practice of talking before and after a session when they would ask each other: "'What went good? What was well done? What was something we need to rethink about?' And I think just keeping those open lines of communication is the main thing to support a new teacher" (Interview, 6/22/2023). Open-ended questions and "open lines of communication" (Interview, 6/22/2023) shared between Mila and her novice teacher were a process for observing and articulating their teaching practices together.

Discussion

Mila brought in her history, values, experiences, and perspectives as an Indigenous teacher in an Indigenous space into her learning throughout the PD and following it. First, the PD fostered Mila's feeling of *aina.* Similarly, Mila's own meaning-making was often connected to her observations of her students' learning. She described both her own experiences of connection and what she observed as the students making their own connections to the land, living being, community, and culture. Second, Mila found the PD challenging which promoted a greater sense of engagement with her teaching practice in all areas of the PD. Third, Mila learned how to promote a safe, inclusive, and respectful classroom environment. She did so by engendering competence in the PD learning and promoting inclusive practice with her students. In particular, the PD shaped Mila's practices in her classroom, and relations with her students and fellow educators.

The PD contributed to developing a community of learners who felt connected to and respected by one another. Mila collaboratively shared and constructed ideas with fellow educators, and she emphasized the importance of trust between her and her novice teacher that was generated through consistent communication, open-ended questioning, and flexibility in her approach to teaching. The ecological aspects of the motivational framework for culturally relevant teaching are that the learning environment promotes diversity, inclusion, respect, and equitable learning (Ginsberg & Wlodkowski, 2012). By both creating PD materials to promote inclusive teaching practices, and fostering an environment of cultural responsiveness, this learning environment allowed for greater choice, authenticity, and learning through challenges for the participants, as exemplified by our interpretations of Mila's engagement.

The job-embedded approach to the PD manifested all facets of the motivational framework for culturally responsive teaching for Mila. Her key areas of motivation in culturally responsive learning, as framed by Ginsberg and Wlodkowski (2012) in the form of attitude, meaning, competence, and inclusion, were promoted by her experience during and following the PD. Mila gained a deeper ability to center her relationships with students around her Hawaiian values of respect and equity. Moreover, she collaboratively worked alongside her novice

teacher and other educators at the school in ways that would not have otherwise been possible. In particular, the RPP allowed for PD at the intersection of culture and STEM+C that was meaningful to an Indigenous teacher in a highly ruralized context. Importantly, while her experiences are unique to her own sense of motivation and meaning, the theoretical approach in this case study could be applied to other similar contexts to gain understanding of the multi-dimensional, interpersonal, and intrapersonal ways teachers learn about culturally responsive teaching in STEM+C or other topic areas.

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