

HO‘OPILINA: THE CALL FOR CULTURAL RELEVANCE IN EDUCATION

Shawn Malia Kana‘iaupuni and Brandon C. Ledward

The research findings presented here are the results from a much larger project, the Hawaiian Cultural Influences in Education study. The exploratory analysis examines teaching practices used to achieve greater relevance. The data include teachers and schools representing the diverse social and cultural milieu found in the state of Hawai‘i. Regardless of school type, teachers from different cultural backgrounds recognize the advantages of cultural relevance, reporting a range of culturally responsive teaching practices. The data suggest that in culture-rich environments, teachers push beyond conventional best practice to achieve greater relevance, relationships, and rigor using culturally responsive, relevant approaches. Teachers can and must make learning culturally meaningful to their students and families by honoring culture and place in teaching and learning with respect to the heritage language, family and community involvement, instructional content and context, and authentic assessment.

CORRESPONDENCE MAY BE SENT TO:

Shawn Malia Kana‘iaupuni, Public Education Support, Kamehameha Schools
567 South King Street Suite 300, Honolulu, Hawai‘i 96813
Email: shkanaia@ksbe.edu

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What science tells us about how the brain works is consistent with what we know intuitively and from our own learning experiences. The more relevant the learning process, the more we learn (Nussbaum, 2003, Nussbaum & Daggett, 2008). In this article, we explore what it means to achieve relevance through culture-based education in the context of Native Hawaiian students. Using a new and unique set of data on teaching practices and student outcomes, our study examines the intersection of cultural relevance and education in Hawai‘i. It builds on prior research and theory about culture-based education, speaking to the range of strategies employed by teachers to establish a highly relevant learning environment.¹

The research findings presented are the results from a much larger project, called the Hawaiian Cultural Influences in Education (HCIE) study. The HCIE study is a community-based participatory research project involving the Hawai‘i Department of Education (DOE), researchers from the University of Hawai‘i, and Native Hawaiian and other charter schools in the state of Hawai‘i. The purpose of the study is to identify relevance-building strategies that will lead to positive learning and growth among Native Hawaiian children who, along with other indigenous children in this nation, often share a history of poorer educational achievement compared to their peers in public schools. Our hope is that the findings will inform policies and programs aimed at improving the educational experience of all learners.

The exploratory analysis summarized in this article examines teaching practices used to achieve greater relevance. The data include teachers and schools that represent the diverse social and cultural milieu found in the state of Hawai‘i. The key findings indicate that, regardless of school type, *teachers from many different cultural backgrounds recognize the advantages of cultural relevance*, reporting a range of culturally relevant teaching practices that help them connect with their students in meaningful ways. Moreover, we find that, across all school types including culturally grounded schools, *teachers report consistent use of strategies that are generally considered best practice* in teaching and instruction. Finally, the evidence indicates what may translate into a “double win” for children in culture-based environments. Specifically, the data suggest that in culture-rich environments, *teachers go above and beyond conventional best practice to achieve relevance, relationships, and rigor*, delivering highly relevant education via culture-based strategies *in addition* to the body of teaching strategies known as best practice.

Some important implications stem from this research. First, the innovation revealed in many of the sampled schools is substantial, holding promise for new understandings in education and instruction. Our research published elsewhere also suggests positive implications for student outcomes (Kana'aiaupuni, Ledward, & Keohokalole, 2011). Second, the data suggest that fears about what is lacking in culturally relevant educational settings may be misguided. Rather than leaving behind the research-based practices most likely to yield successful learning, teachers who facilitate learning via culture-based practices use an expansive repertoire of effective teaching practices to make learning intensely relevant to the children they are serving.

Among other implications, these findings challenge us to revisit current educational approaches in teacher preparation and training in addition to instructional design and implementation. Successful approaches to relevance also require rigor themselves, which may not be best achieved through blanket cultural diversity training in schools or teacher education programs. Based on the accumulated research to date, we conclude that great teachers have ample knowledge about content and instruction, and they also understand the fundamental importance of cultural relevance and relationships in their work with children and their families. Our findings are consistent with other research showing that relevance is a best practice found among master teachers. Surprisingly, however, the idea of relevance, and especially cultural relevance, is relatively absent from mainstream discussions about professional development strategies to support teacher effectiveness.²

WEIGHING RELEVANCE IN EDUCATION

Relevance is critical to educational success for many reasons. It is, in a sense, the cognitive glue that makes learning stick. It improves academic success, while enhancing relationships between educators, students, and their communities. It empowers learners and ensures equal learning opportunities. Just as important, relevance helps students prepare to live in a multiethnic and pluralistic society.

Creating greater relevance is not tied simply to race or ethnicity, but considers learning styles and multiple intelligences (e.g., see Demmert, 2005; Ladson-Billings, 1995). Making education relevant means valuing the home culture while

helping students make connections between their community, national, and global identities (Bruner, 1996; Gallimore & Goldenberg, 1996; e.g., see Kaiwi & Kahumoku, 2006). It requires structuring learning to engage students in complex thinking and applying knowledge to real world situations. Rather than focusing on “putting” knowledge into students, a relevance-based approach entails instructional strategies that affirm what students already know, helping them to connect new learning to prior knowledge or experiences and to apply and experiment with ideas (Daggett, 2005; Nussbaum & Daggett, 2008). According to Abt-Perkins and Rosen (2000), “research on culturally relevant and responsible instruction clearly shows that knowledge of students’ family, community and socioethnic cultures—their languages, literacy practices, and values—can help teachers address the interests and build on the skills of their students” (p. 254). However, making learning relevant means educators must understand the role culture plays in the teaching and learning process (e.g., see Kawakami, 1999, 2003; Tyler et al., 2008).³

At a more macro-level, all education is culture-based, whether driven by a dominant Western cultural model or another cultural grounding. Accordingly,

It is surely the case that schooling is only one small part of how a culture inducts the young into its canonical ways. Indeed, schooling may even be at odds with a culture’s other ways of inducting the young into the requirements of communal living.... What has become increasingly clear...is that education is not just about conventional school matters like curriculum or standards or testing. What we resolve to do in school only makes sense when considered in the broader context of what the society intends to accomplish through its educational investment in the young. How one conceives of education, we have finally come to recognize, is a function of how one conceives of culture and its aims, professed and otherwise. (Bruner, 1996, pp. ix–x)

The basic logic of why culture is important to education is simple and intuitive, especially when it comes to making learning relevant: not all cultures are the same. In a country like the United States that prides itself on its cultural diversity, not all children achieve their highest potential in an educational system where relevance

is based solely on Western approaches. Successful schools welcome opportunities to resonate culturally with the students and families who they teach and serve. Among other reasons, the benefits include heightened cognitive connections and stronger relationships, opening doors to achieving greater rigor and high expectations of all learners.

In this context, the need for cultural relevance has few critics, yet challenges exist in implementation. Especially challenging is how to create relevance that recognizes and validates students who may represent a variety of cultural backgrounds, especially non-Western cultures. A typical approach is to discuss different cultural traditions and tolerance as part of the curriculum, but this method hardly meets the goal of relevance in education. Educators and policymakers also puzzle over whether cultural relevance comes at the expense of other important sources of knowledge. For example, debates have raged about teaching significant non-Western works in literature and history versus focusing on the Western canon (Bloom, 1987). If children are taught an expanded, arguably richer, set of cultural perspectives, will they come away with a less rigorous academic knowledge? Will we have a society that lacks common understandings?⁴ Others worry about how to achieve cultural relevance in ways that sustain cultural integrity. For example, can a teacher of one cultural group provide meaningful cultural relevance to students of another cultural group, the classic insider-outsider dilemma (Haig-Brown, 1992)? In addition, some fear that the quest for relevance may cause teachers to stray from the set of research-based “best” practices determined to be most effective for learning, thereby yielding subpar results in achievement. For example, will student achievement suffer if teachers use culturally relevant educational strategies?

RELEVANCE BEGINS WITH UNDERSTANDING THE SOCIOHISTORICAL CONTEXT

As an ethnic group, today's Native Hawaiians share similar experiences with other indigenous and racial/ethnic minority groups in the United States. As an indigenous culture, however, the lineage of Native Hawaiians traces back to a thriving, healthy Polynesian society that achieved highly sophisticated governance and knowledge systems to navigate and prosper in the Pacific. Two hundred years after settling in Hawai'i, Western contact brought exposure to new diseases and

drastic population decimation, reducing this traditional society to one-tenth its size (Nordyke, 1989). But it also brought the codification of Hawaiian language. Shortly thereafter, literacy rates topped 90% within the Hawaiian population. A robust reading, writing, and publishing community in the Hawaiian language quickly emerged, and many teachers in the first schools in Hawai'i were Native Hawaiians (Wilson & Kamanā, 2006).

Over time, however, the Hawaiian language was perceived to be a threat to growing Western influence in Hawai'i. The deep and lingering effects of the de facto ban on Hawaiian language within all public and private schools cannot be overstated in regard to education (see Lipka, 2002; also Anders-Baer, 2008, in his discussion of the devastating effects of linguistic genocide). The impact was systematic in effect, remaining in place for nearly 100 years (Lucas, 2000, Wilson & Kamanā, 2006). This event occurred shortly after Hawai'i became a territory in 1896, by decree of Sanford Dole, who played a key role in the Hawaiian kingdom overthrow and operated as the first Education minister.

The effects are conveyed in a simple exercise: imagine that the U.S. government is taken over and political change mandates Chinese (or any language) as the only acceptable language in schools—no English is allowed without permission from Chinese-speaking officials. In the weeks that follow, young mothers and fathers send their joyful 5-year-olds off to school, knowing that they will not understand what is happening and, moreover, would be punished for speaking English. Every time families speak to their children in English it is with fear, because they might use it accidentally the next day in school. Children are reprimanded or worse for speaking their language.⁵ Parents urge their children to sit quietly in class and to try to learn the new language—without using their own. To protect their children and to follow the rules, parents may feel forced to give up their language involuntarily, which is exactly what happened among Hawaiians (and many other indigenous groups, as documented by the United Nations' Permanent Forum on Indigenous Issues).

The marginalization of the Hawaiian language is a prime example of the sociohistorical legacy Native Hawaiian children and families experienced in the context of Western schooling. It was not until 1986 that the state's Board of Education approved an amendment to allow for "special projects using the Hawaiian language" (Lucas, 2000, p. 11). The first Hawaiian language immersion public school (*kula kaiapuni*) was opened shortly thereafter. Now enrolling about 1,900 students annually and

at times offering language classes to their parents, the Hawai'i DOE recently celebrated 20 years of Hawaiian language immersion education. This accomplishment is a tribute to the many teachers, parents, children, and administrators who worked tirelessly to make that vision a reality. Today, although troubled by a critical lack of resources, this effort has helped grow the Hawaiian language in the past decade, standing out as a singularly important educational milestone achieved for and by an indigenous community in the United States.

Past and current statistics on Native Hawaiian well-being are a testament to the enduring detrimental impact of this history and its related events (Kana'iaupuni, Malone, & Ishibashi, 2005). Comprising one-third of annual births in Hawai'i and about one-fourth of public school students, Native Hawaiian children attend schools that serve many racial/ethnic groups, the next largest among them being White (or Caucasian), Filipino, Chinese, and Japanese. In public schools, aggregate Hawaiian student achievement levels lag behind these other groups by up to 30 percentile points. Rates of chronic absenteeism, dropping out, and grade retention are significantly higher than average, suggesting low levels of student engagement. Native Hawaiian children in special education far outweigh their representative proportions in schools. Graduation rates are lower than other groups, and not surprisingly the percentage completing a college degree is about half the state average (Kana'iaupuni et al., 2005).

Broadly speaking, one conclusion that we can draw from the statistical trends is that relying on best practice in Western education is not always sufficient to bring out the best in all children. It suggests that teachers and schools are falling short of achieving meaningful connections with certain groups among the children they serve. Knowing this helps galvanize the search for greater relevance in education, which is the intent of this study. Prior research shows that efforts to integrate culture and education hold significant promise for children. Promise is especially meaningful for those with historically poor relationships with school, helping to stimulate educational innovation, relevance, and relationships, fundamental building blocks to rigor.

CULTURAL TRANSMISSION IN EDUCATION IS UNAVOIDABLE

Education encompasses teaching and learning specific skills, and also something less tangible but more profound: the imparting of knowledge, positive judgment, and well-developed wisdom. As one of its fundamental purposes, education exists to transmit culture from generation to generation. The Latin roots of the word education mean "to draw out," facilitating the realization of self-potential and latent talents of an individual.

In early Western society, as in most societies, formal education evolved from religious origins, where schools were used to teach religious values, knowledge, and practices. Although contemporary schools continue to transmit values, knowledge, and practices, what was once the most important part of the curriculum is sometimes referred to as the "hidden curriculum" because it is not always recognized or explicit (Snyder, 1970). It has to do with how schools not only transmit knowledge to children, but also their important role in teaching the values and culture of a society. In the landmark case *Brown v. Board of Education of Topeka*, 347 U.S. 483, heard by the U.S. Supreme Court in 1954, Chief Justice Earl Warren wrote:

Today, education is perhaps the most important function of state and local governments. Compulsory school attendance laws and the great expenditures for education both demonstrate our recognition of the importance of education to our democratic society.... It is the very foundation of good citizenship. *Today it is a principal instrument in awakening the child to cultural values*, in preparing him for later professional training, and in helping him to adjust normally to his environment. In these days, it is doubtful that any child may reasonably be expected to succeed in life if he is denied the opportunity of an education. Such an opportunity, where the state has undertaken to provide it, is a right which must be made available to all on equal terms.⁶

The point that Chief Justice Warren made about culture in schools is not a new one. Since the beginning of time, education has ensured cultural survival, serving the primary purpose of passing on the knowledge and wisdom of a people. Cultural

evolution has and will always require the transmission of cultural knowledge. What many lose sight of is that all educational systems and institutions are rooted in a particular cultural worldview.

The critical question is whose culture is being transmitted and what cultural values are “being awakened” in children? In the United States, schools reflect mainstream Western worldviews, where Western culture is the norm. Some scholars argue that there is bias against non-Western worldviews and that children of non-Western ethnic or indigenous groups are thereby disadvantaged (Cornelius, 1999; Loewen, 2007; Sue, 2004). But to most people, including teachers and parents, these biases are often invisible and unrecognized.

Contemporary approaches to culture in education include specialized schools or programs that teach children specific cultural traditions and knowledge, such as dance, theater, sports, or art. In addition, as a means of spanning multiple cultures in today's classrooms, most U.S. schools teach cultural diversity or sensitivity stressing respect and tolerance for non-Western cultures and ways of learning, including staff, student, and faculty training (see Gutierrez & Rogoff, 2003). This approach has benefits in building awareness of cultural differences among students, staff, and faculty and may help achieve greater understanding and respect for diverse cultures (Godwin, Ausbrooks, & Martinez, 2001). Whether these approaches are sufficient for achieving relevance in teaching and learning is another question. Arguably, the use of culture-based education strategies (i.e., teaching *through* the lens of culture) is very different from simply teaching “about culture.”

PRIOR RESEARCH ON THE IMPACT OF CULTURALLY RELEVANT EDUCATION

Both theory and research substantiate the importance of culturally relevant education, including the need for a range of educational approaches that create space for and/or are critically grounded in a particular cultural worldview. First is the cultural survival of indigenous and other groups and the often neglected but critical role of education in that process. Research indicates that assimilationist policies in Western education resulted in a loss of native culture and

language along with marginalizing the identities of indigenous children who feel alienated from school (Anders-Baer, 2008; Benham & Heck, 1998; Lipka, 2002; McAlpine & Crago, 1995; McDougall, 2006; Ogbu, 1982; Wilson & Kamanā, 2006). The movement to stake a claim in education as a community-driven process and product has demonstrated significant success. Scholars show that children's learning is more effective if it occurs in cultural context, that is, with attention to cultural values and behaviors, learning styles, and the context of place and the physical environment (Bruner, 1996; Cornelius, 1999; Gruenewald, 2003; Irvine & York, 1995; Kawakami, 2003; Lee, 2003a, 2003b).

Second, studies highlight that the biggest effects of cultural relevance in the classroom include increased children's self-esteem and resiliency. Culture-based education, including learning the heritage language, helps cultivate a strong sense of individual and collective identity and cultural pride, which can lead to positive self-concept and confidence (Bowman, 1989; Phinney & Chavira, 1992; Phinney, Cantu, & Kurtz, 1997; Tibbetts, Kahakalau, & Johnson, 2007). In turn, self-confidence typically supports achievement and many other kinds of lifetime successes. For example, one study found that learning genealogy was positively correlated with school performance, and speaking a non-English language was inversely associated with substance abuse and depression among Filipino students (Guerrero, Hishinuma, Andrade, Nishimura, & Cunanan, 2006). Some theorists caution, however, that the positive association is not necessarily automatic (Steele, 1992). Harmful stereotypes continue to challenge ethnic minority students, especially the high achieving ones, who may eventually disengage from performances where they may be judged against the White norm (Steele, 1997).

Third, consistent with the findings presented in this article, culturally relevant schools typically demonstrate solid relationships with and support from surrounding communities and families. Strong links between home, neighborhoods, and school are key features of effective educational programming in indigenous communities (Kana'iaupuni et al., 2005; Lipka & McCarty, 1994; NICHHD, 2005). Studies find that the shared priority for integrating language and culture in schools serving indigenous youth links indigenous parents, youth, and educational leaders (Demmert, 2001; Yazzie, 1999).

Despite strong interest and, for some, intense emotional investment in culturally relevant education, we still struggle to understand the empirical effects of culture and cultural identity on student achievement and to measure the direction of causality (Demmert & Towner, 2003). Overall, however, the data are promising.

At the state, national, and international levels, indigenous culture-based education indicates successful outcomes where other Western culture-based strategies have failed in reducing educational disparities between indigenous students and their peers (Brenner, 1998; Kana'iaupuni et al., 2005; Kana'iaupuni et al., 2011). Moreover, culturally informed teaching enables educators to create “collaborative and culturally sensitive classroom environments, cultural patterns in classroom verbal interactions, and other cultural dimensions of reciprocal interaction and dialogic instruction” that encourage “the participation and engagement of the diverse students in their classrooms” (Abt-Perkins & Rosen, 2000, p. 254).

Research in Alaska schools indicates that Native Yup'ik approaches to math improved test scores in Native and non-Native students, outperforming other schools (Adams, Adam, & Opbroek, 2005). Several case studies indicate that weaving together cultural content and effective pedagogy results in highly engaged student activity and appreciable indigenous student learning in math, compared to matched control groups (Lipka, Sharp, Brenner, Yanez, & Sharp, 2005; Rickard, 2005).

Curriculum and pedagogy are critical to success. For example, another Alaska study found that using a culturally grounded curriculum yielded superior learning results over conventional textbook-based instruction among urban and rural Native and non-Native Alaskan students (Sternberg, Lipka, Newman, Wildfeuer, & Grigorenko, 2005). Consistent with these findings, other research has shown that use of Native American cultural values facilitates students' academic performance (Allen et al., 1999, Hilberg & Tharp, 2002), including when employed by non-indigenous teachers (Webster, Wiles, Civil, & Clark, 2005).

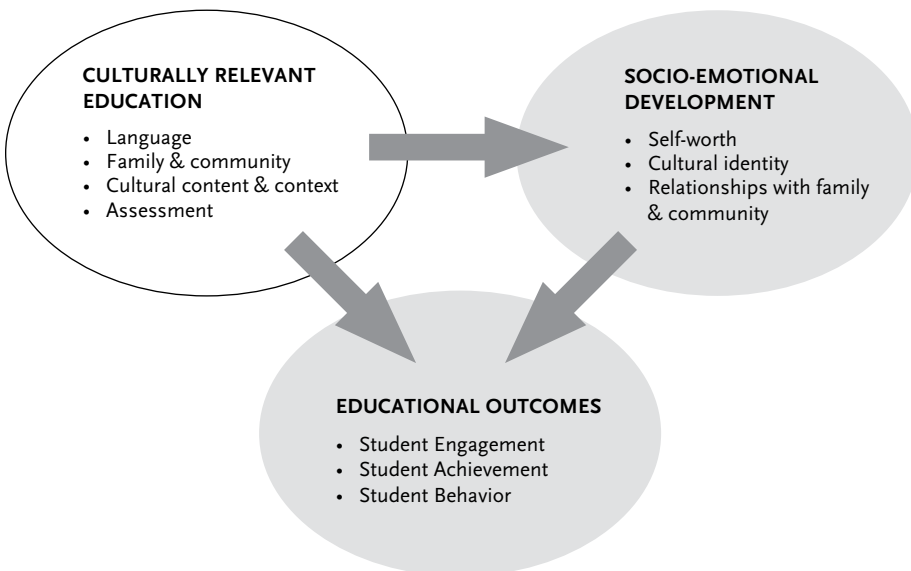
In the context of Hawai'i, studies indicate that Native Hawaiian children learn, connect, and retain knowledge more effectively when the material is culturally meaningful and relevant to their own lives and experiences (Kaiwi & Kahumoku, 2006; Kana'iaupuni et al., 2011; Kawakami & Aton, 2001). Research conducted to explore successes among Native Hawaiian students consistently indicates the strengths of innovative, Hawaiian-focused charter schools in reaching students that other public schools have struggled to serve. In particular, the data show that students in these charter schools have high engagement in learning bolstered by higher attendance and graduation rates compared to Native Hawaiian children in conventional public schools. Contributing to this advantage are the successes that the charter schools document in achieving high levels of trust in schools and family involvement in the educational process (Kana'iaupuni & Ishibashi, 2006).

A growing body of case studies and empirical research supports the effectiveness of culturally relevant education. At the same time, researchers have yet to identify, define, and account for the range of culturally relevant education practices in use and their relationships on student outcomes (Demmert & Towner, 2003). This study contributes to the existing knowledge base by using a definition and model of culture-based education to explore relevance in teaching practices in a range of schools.

HIGHLY RELEVANT EDUCATION IN THEORY AND PRACTICE

Based on the existing literature from various disciplines (including psychology, education, sociology, anthropology), we expect that cultural relevance in education has direct effects on children’s socioemotional development and both direct and indirect effects on other educational outcomes. Educational outcomes include academic achievement as well as student engagement in learning and other related behaviors (see Figure 1). This analysis informs our knowledge of how teachers use a range of culturally relevant practices (represented in the unshaded oval), in the context of the education of Hawaiian children.

FIGURE 1 Hawaiian cultural influences in education study model



Based on the literature, our initial hypotheses included the following:

- H1. We expect that teachers use culturally relevant practices in each of the participating types of school settings. Because relevance is generally considered an important best practice, we should find it across the span of school types examined, although Hawaiian cultural relevance will likely occur less frequently in conventional public school settings that have lower concentrations of Hawaiian students. Although not examined in this analysis, some of the conditions conducive to use include support from leadership, colleagues, and surrounding community.
- H2. All teachers, including “out of culture” teachers, will demonstrate use of relevant cultural strategies. However, use of these strategies will be more commonly found among “within culture” teachers who share a similar background with Native Hawaiian students.
- H3. Teachers using relevant cultural strategies will less frequently use other “best practice” strategies. This hypothesis links back to some of the key challenges discussed earlier about the suspected trade-offs feared with culturally relevant education. It is also based on an understanding of the amount of work that goes into being a good teacher and recognition that some trade-offs might be necessary because of sheer time constraints.

Defining Culturally Relevant Education

The definitions and framework used in this research are based on earlier work presented by Kana'iaupuni and Kawai'ae'a (2008). They define culture most simply as shared ways of being, knowing, and doing, in this case Hawaiian indigenous culture. Cultural relevance is best achieved when teaching and learning are grounded in these shared ways, including the values, norms, knowledge, beliefs, practices, experiences, and language that are the foundation of a culture.

Based on the existing literature, five critical components that make learning relevant emerge in the definition of culture-based education proposed by Kana'iaupuni and Kawai'ae'a (2008). Shown in Figure 2, the look and feel of these five varies from setting to setting, depending on cultural ways of being, knowing,

and doing. Some common features include a focus on place-based, community-oriented educational approaches that draw on the resources and expertise of the cultural and local community. To achieve cultural relevance in the learning process, teachers integrate strategies from each of these five areas.

FIGURE 2 Key components of culture-based education

| | |
|-------------------------------|--|
| Language | Recognizing and using native or heritage language. |
| Family and Community | Actively involving family and community in the development of curricula, everyday learning, and leadership. |
| Content | Making learning meaningful and relevant through culturally grounded content and assessment. |
| Context | Structuring school, classroom, and other learning interactions in culturally appropriate ways. |
| Assessment and Accountability | Gathering data and assessing students using various methods to ensure learning and application in culturally responsible ways. |

Source: Kana'iaupuni, S. M., & Kawai'ae'a, K. K. C. (2008). E lauhoe mai nā wa'a: Toward a Hawaiian indigenous education teaching framework. *Hūlili: Multidisciplinary Research on Hawaiian Well-Being*, 5, 75.

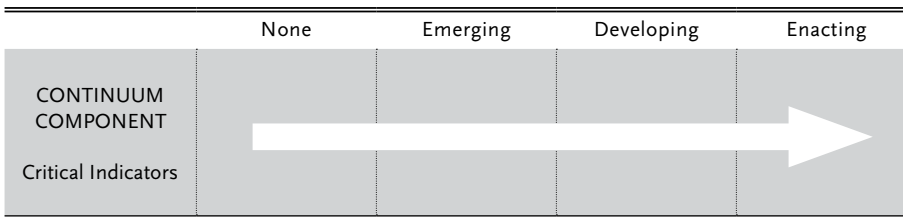
The Hawaiian Indigenous Education Rubric (HIER)

Based on this definition, a rubric was developed by a select group of educators and researchers to understand highly relevant teaching in the context of Hawaiian culture. Kana'iaupuni and Kawai'ae'a (2008) present a fully detailed description of the development of this tool, which met or exceeded acceptable thresholds for statistical reliability and validity. We revisit some of their description here for the purposes of understanding culturally relevant teaching practices informed by Hawaiian perspectives.

The questions guiding the development of the framework were twofold: what does culturally relevant teaching look like from the teacher's perspective and what behaviors might we expect to see at different levels of intensity? The framework is organized into the five components, or continua, each containing a set of critical indicators that tie directly to the experiences of teachers. In turn, these indicators are attached to a series of descriptors that increase in intensity, categorized into

none, emerging, developing, and enacting (see Figure 3). Both the critical indicators and corresponding descriptors are focused on behaviors to illustrate the continua of different levels of Hawaiian indigenous teaching strategies.

FIGURE 3 Developing a framework: The hawaiian indigenous education rubric (HIER)



Source: Kana'iaupuni, S. M., & Kawai'ae'a, K. K. C. (2008). E lauhoe mai nā wa'a: Toward a Hawaiian indigenous education teaching framework. *Hūlili: Multidisciplinary Research on Hawaiian Well-Being*, 5, 77.

With this framework, we can begin to describe Hawaiian indigenous education from a teacher's perspective. The first column, *None*, identifies practices that might be most closely associated with typical instruction (reflecting key descriptors such as classroom-based, textbook-driven, teacher-focused, lecture, paper-and-pencil tests, standardized testing, English only, Western culture, individually oriented). The last column, *Enacting*, attempts to capture a picture of fully implemented Hawaiian culture-based education (with descriptors such as 'ōlelo Hawai'i/Hawaiian language, community-based, group-oriented, spirituality, cultural values and knowledge, 'ohana-based/family-based, intergenerational, place-based, hō'ike/performance, culturally purposeful). As is true of most models, the enacting category is an "ideal" type, and it may not be the case that any existing school identifies itself as enacting across all continua of the rubric.⁷

Using this framework, we can begin to describe Hawaiian indigenous education from a teacher's perspective.⁸ The HIER is displayed in full in Table A1 of the Appendix for reference. The first component focuses on Hawaiian language. The second continuum is about 'ohana and community involvement. The third area examines content, including culturally based curriculum and materials, place-based content and strategies, and the overall philosophy about culture at school. The fourth continuum is context, where teachers reflect on the degree

to which their teaching and learning practices integrate cultural practices of delivery. The last set concerns assessment, data, and accountability, primarily focusing on measuring learning and the purpose of education. To assess the degree of alignment with effective teaching practices, we also measured three of the five standards developed by the Center for Research on Education, Diversity and Excellence (CREDE) at the University of California, Berkeley (see Doherty & Hilberg, 2007).

DATA COLLECTIONS METHODS

Instruments

For the larger HCIE project, four self-administered instruments were designed collaboratively with a research team, including the research advisory group, the University of Hawai'i Department of Psychiatry's Native Hawaiian Center of Mental and Behavioral Health, and representatives from several public schools. These include the:

- CBETT (Culture-based Education Teacher Tool, based on the HIER),
- CBEAT (Culture-based Education Administrator Tool, based on the HIER),
- CBEST (Culture-based Education Student Tool), and
- CBEPT (Culture-based Education Parent Tool).

When linked together the surveys offer a holistic and integrated understanding of culturally relevant education from multiple perspectives, yielding data at the school, student, and parent/home level of analysis.

For the purposes of this article, we focus on the CBETT, which seeks to identify a range of teaching and learning strategies currently being used by educators in Hawai'i schools (full survey available upon request). The CBETT is a self-admin-

istered teacher questionnaire. The items are based on two sources: the HIER and best practice standards established by CREDE. The CREDE standards provide an external benchmark, based on research showing their positive effects on student learning in minority and indigenous communities⁹ (Doherty & Hilberg, 2007; Hilberg, Tharp, & DeGeest, 2000). Specifically, data on three of the CREDE standards were gathered for validation purposes, including (a) using language across the curriculum, (b) creating joint learning activities, and (c) making connections to home and community. Statistical analyses were performed to assess reliability and validity. The findings (not shown here) indicated a high degree of correlation between the HIER continua and the CREDE standards and robust internal reliability results for each continua (Kana'iaupuni & Kawai'ae'a, 2008). Note that for administration as a survey, the question items were randomly sequenced to reduce response bias or socially desirable responses.

Participating Schools and Respondents

The teacher survey data includes 600 teachers in 62 of the 81 invited middle and high schools across the state of Hawai'i. Because we wanted to hear from a full spectrum of voices, the schools that were asked to participate reflect a range of geographic and cultural diversity. By geographic area, survey respondents were sought from all existing public charter schools, DOE schools, and Hawaiian immersion programs that offer intermediate and/or high school level courses. Also, several private school campuses on different islands within the state were included in the sample pool.¹⁰

Surveys were distributed to teachers who have instructional contact with students in Grades 7 through 12. Their participation in the study was completely voluntary. In the end, surveys for phase 1 of the study (the teacher phase) were distributed to approximately 1,500 teachers and 100 principals and administrators across the state, resulting in 62 participating schools or 76.5% of those invited. These schools represent a range of school types on five islands (Hawai'i, O'ahu, Kaua'i, Maui, and Moloka'i) including conventional and Hawaiian immersion schools in the DOE, startup and conversion Hawaiian- and Western-focused charter schools, and private school campuses. (Table 1 in the Results section shows descriptive information about participating teachers.)

Data collection was extensive, primarily occurring between March and December 2006. Extensions were granted in some cases through June 2007. Although teaching strategies may not shift drastically from year to year, teachers, principals, and administrators were instructed to respond to survey questions based upon their experience in the 2005–2006 school year. Hard copy surveys were delivered via U.S. mail to select schools, and in some cases forms were sent electronically by email. An online version of the survey was also made available to respondents. Data entry was contracted to a third-party professional vendor who received completed surveys directly and reported response rates to the research team on a regular basis. For hard copy surveys, the vendor verified data by entering responses twice into the final dataset. To ensure adequate participation across the sample group, school level incentives were offered and a drawing was held to reward one responding teacher. All data collected for this study are kept strictly confidential and analyses are performed at the school, school type, and overall population levels only. In this way, individual teachers and schools cannot be identified in any research findings. The research team also conducted classroom observations across a representative sample of schools to inform data analysis and interpretation of findings.¹¹

Data Analysis

The data analysis plan for the teacher survey is anchored in the HIER discussed earlier and categorized by the three major school types that participated (DOE, private, and charter schools). The key outcome of interest is teachers' self-reported use of culturally relevant teaching practices. All variables were coded in relation to their location within the HIER's five broad continua: Language, Family and Community, Content, Context, Assessment and Accountability. Some questions required reverse coding to maintain the directionality of the indigenous education construct. Depending on the question type, teachers rated their responses along a 4- or 6-point scale. For ease and comparability, all items were standardized to a 6-point scale. Informed by exploratory data analysis, missing values were replaced in the dataset using a mean substitution method based on patterns of responses. After creating a series of histograms for all numeric variables, the researchers utilized a visual grouping strategy to identify cutoff points between value intervals. Missing values were replaced by values consistent with those of respondents

sharing the similar mean value per continuum (Ledward & Tibbetts, 2007). No missing values were replaced for individuals missing half or more total responses per continuum.

To account for institutional and environmental differences, schools were classified in two ways by school type. The first grouping corresponds to official (i.e., legal) definitions of the schools, namely those governed by the Hawai'i DOE, private schools, and charter school law. These broad categories allowed examination of the characteristics of mainstream public, private, and charter schools, but glossed over crucial variations in the educational approaches within each group. We further disaggregated the public sector schools, based on analyses showing varying patterns of use of culturally relevant teaching practices. Specifically, statistically significant differences ($p < .05$) emerged between conventional DOE schools and Kula Kaiapuni Hawaiian Immersion DOE schools, and also between Western-focused charter schools, Hawaiian-focused charter schools, and Hawaiian-medium charters, where Hawaiian language is the medium of instruction and extends beyond instruction to school staff and operations. In this article we present findings for both sets of groupings.

We report the results for culturally relevant teaching using average summative scores. These values were derived by summing the results of all variables in each continuum, weighted by their location along the HIER. Responses in the None column were multiplied by 0, values corresponding to Emerging were multiplied by 1, Developing responses were multiplied by 2, and items indicating Enacting behaviors were multiplied by 3. To make comparisons across the HIER, summative scores were divided by the total possible points for each continuum and multiplied by 100. The higher the value is, the greater the cultural relevance in teaching practice.

A second composite variable was created to account for more intensive use of culturally relevant teaching practices. Values for the Enacting column of each continuum were summed and ranked into quartiles based on the total possible points allowed. Teachers who scored in the upper quartile (75% or higher) were labeled "Intense" users for any particular continuum. Those who scored in the upper quartile in 4 out of 5 continuums were labeled "Intense Overall." Four, rather

than five, continua were used to create the “Intense Overall” category, simply to adjust for the fact that some schools are Hawaiian medium and automatically have the highest values on the language continuum. As such, the indicator provides a conservative estimate of intensive use.

Limitations

The data and findings generated from this study are tempered by two main restrictions having to do with sample size and the overrepresentation of Hawaiian teachers. Nevertheless, we believe the findings contained in this article are meaningful and defensible. The overall sample size is sufficiently large to sustain statistical analyses, though the number of responding teachers in some schools was relatively small. Overall, 600 or roughly 40% of invited teachers chose to participate in the study. In an effort to increase the ability to generalize from the data, researchers attempted to collect surveys from at least 50% of the eligible teachers within each school. More than half of teachers completed surveys in 22 schools, or 35%. In 13 (21%) schools less than 1/5 of teachers completed surveys. These schools were spread out geographically across the sample group with the highest concentrations in east Hawai‘i and Maui.

The distribution of teacher ethnicity places an additional limitation on research findings. As Table 1 describes in the following section, 37% of teachers claim Hawaiian ethnicity. For example, in the DOE category, 24% of responding teachers self-identify as Hawaiian. These figures reveal an overrepresentation of Hawaiian ancestry among responding teachers. According to the 2006 Superintendent’s Annual Report, 9.9% of teachers within the DOE system report being Hawaiian (although this number underestimates teachers with Hawaiian ancestry because it captures only one “primary ethnicity” versus allowing multiple answers). Although we would expect a difference because of question wording, it is also likely that the project may have attracted greater response rates from Hawaiian teachers. Together, these factors mean that the teachers’ results may not be generalizable to all teachers in the school or state.

Finally, although evidence on the accuracy of self-reported data from teachers is mixed, we are confident in the data because the survey was designed to temper overinflation of responses in favor of any particular teaching practice. The measures of central tendency also suggest few surprises that might indicate otherwise. Altogether, the results from these data provide important insights into the practices that teachers report using and can be used to understand student outcomes in future studies.

RESULTS

This section analyzes several tables of information, exploring the data by school setting with respect to commonalities and differences. We begin with an overview of respondents' characteristics and then turn to the culturally relevant teaching practices that they report, presented by school type.

Teacher Characteristics

Table 1 displays the descriptive characteristics of teachers by school type (see Table A2 in the Appendix for description of variables). Generally speaking, charter school teachers are younger, with 60% under the age of 35, compared to half that percentage in the other two settings. Women dominate, although the private schools have the highest percentage of male teachers (42%) and charter schools the lowest (31%). Ethnicity varies considerably, with about one quarter of DOE respondents reporting Hawaiian ancestry, the majority are Caucasian (46%), and another third report some Japanese ancestry. The private schools are similar, except that more (45%) respondents report Hawaiian ethnicity. In the charter schools, fully 61% of respondents are Hawaiian, about half report Caucasian, and 19% Japanese, ancestry. Across schools, about 45% of teachers report other ethnic ancestries.

TABLE 1 Variables describing teacher characteristics by school type

| | DOE | Private | Charter | All schools combined |
|---|------|---------|---------|----------------------|
| Age (n=574) | | | | |
| Avg teacher age (yrs) | 44.1 | 45.5 | 37.6 | 43.1 |
| % 35 or younger | 28.5 | 26.3 | 61.2 | 34.8 |
| Gender (n=585) | | | | |
| % Female | 65.2 | 58.2 | 70.5 | 64.6 |
| Ethnicity (n=582)* | | | | |
| % Hawaiian | 24.3 | 44.6 | 61.0 | 36.9 |
| % Caucasian | 46.4 | 47.5 | 49.6 | 47.3 |
| % Japanese | 32.1 | 28.8 | 18.7 | 28.5 |
| % Other | 42.1 | 51.1 | 47.2 | 45.3 |
| Educational Attainment (n=527) | | | | |
| % BA, BA+ | 44.6 | 32.3 | 43.3 | 41.4 |
| % MA or more | 54.8 | 66.2 | 41.7 | 54.8 |
| % Hawaiian degree | 9.9 | 14.5 | 36.5 | 16.4 |
| Tenure at school (n=537) | | | | |
| % 5 years or fewer | 52.1 | 53.3 | 70.2 | 56.2 |
| % 20 years or more | 6.6 | 16.3 | 2.6 | 8.2 |
| Years of Hawai'i residence (n=581) | | | | |
| % 20+ years | 75.8 | 88.7 | 80.3 | 79.9 |
| Subject(s) taught (n=453)* | | | | |
| % Math | 15.8 | 9.7 | 17.3 | 14.7 |
| % English | 18.2 | 13.2 | 23.6 | 18.2 |
| % Science | 9.4 | 11.1 | 10.2 | 10.0 |
| % History/Social studies | 16.1 | 2.8 | 15.8 | 12.8 |
| % Hawaiian studies/language | 2.4 | 11.1 | 17.3 | 7.7 |
| % Other | 36.5 | 28.5 | 38.6 | 35.0 |
| % Missing (n=600) | 21.9 | 26.4 | 23.6 | 23.3 |
| N | 329 | 144 | 127 | 600 |

*Respondents were asked to choose all that apply, therefore percentages will not sum to 100%

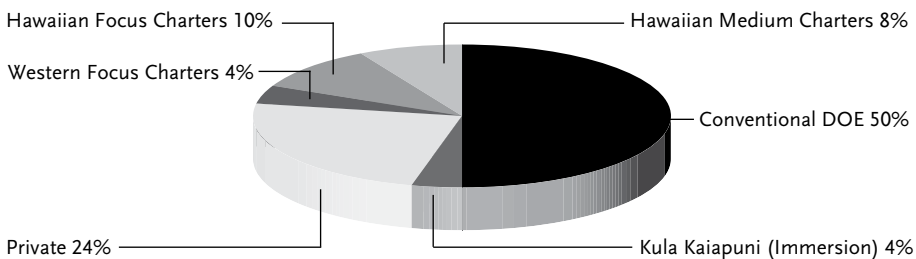
Charter schools have the highest percentage of teachers with less than a bachelor's degree (15%). The private schools have the highest percentage of teachers with a completed master's degree (66%). The DOE falls in between with more than

half of its teachers reporting a master's degree, and 45% with at least a 4-year degree. Also, more than a third of the charter school respondents have a degree in Hawaiian studies or language, compared to 10 and 14% in the DOE and the private schools, respectively. Although not shown, nearly two-thirds of Hawaiian-medium teachers report a Hawaiian studies degree, as would be expected. Presumably some of the rest teach English in Hawaiian-medium schools or are native language speakers themselves.

Significantly fewer DOE and private school teachers have worked at their school for 5 years or less (about 52%), compared to 70% of charter school teachers. These differences are understandable given that most charters were established after the year 2000. Longevity is high in private schools; about 17% of the private school teachers report more than 20 years of tenure at their schools, compared to 7% among DOE respondents and 3% among charter school respondents. On the other hand, about 80% of teachers report living in Hawai'i for more than 20 years (the figure is above 95% for Hawaiian-medium environments, not shown). Although one in four left this question blank, teachers reported a range of subjects taught, including math, English, science, social studies, and Hawaiian studies. Many indicated teaching more than one subject area; some taught all the subjects listed.

Figure 4 displays the study sample of teachers that responded to the survey by disaggregated school type. The smallest percentages were teachers from immersion and charter schools that are not Hawaiian-focused. Again, these small numbers are an important caution with respect to the generalizability of the findings about the kula kaiapuni and Western-focused charters.

FIGURE 4 Teacher respondents by disaggregated school type



Use of Culturally Relevant Teaching Practices

The next table examines how the use of culturally relevant practices varies across the types of educational settings examined (see Table 2). Overall, in support of our first hypothesis, the data suggest that Hawai'i's teachers share a good degree of cultural relevance in their teaching practices, and this is most clearly evident in the consistent patterns of responses across school types. The biggest area of distinction is in exposure to heritage language. Teachers may include very little Hawaiian language content, use it occasionally, or employ it as the primary medium of instruction. Teachers ranged from believing that Hawaiian language has little to do with their teaching, to feeling that some exposure to it is important, or believing that it is central to what they do as teachers. Wide variation across settings is not surprising, given that some of the schools in the study utilize Hawaiian as the primary medium of instruction or at least offer advanced coursework and intensive exposure to Hawaiian language.

TABLE 2 Average summative values for cultural continua and CREDE standards

| | DOE | Private | Charter | All schools combined |
|------------------------------|------|---------|---------|----------------------|
| Summative value* | | | | |
| % Content (n=587) | 56.5 | 66.0 | 79.0 | 63.6 |
| % Context (n=596) | 64.8 | 69.5 | 81.9 | 69.6 |
| % Assessment (n=592) | 77.5 | 80.8 | 86.0 | 80.1 |
| % Family & community (n=597) | 56.4 | 54.7 | 73.0 | 59.5 |
| % Language (n=598) | 37.9 | 54.2 | 74.2 | 49.5 |
| % CREDE (n=600) | 70.8 | 67.5 | 78.8 | 71.7 |
| N | 329 | 144 | 127 | 600 |

*Standardized to 100% to allow comparisons across the continua

Fewer differences emerged between DOE and private school teachers using context and family and community involvement, compared to teachers in charter schools who reported higher averages in both continua. For context, teachers reported teaching with little Hawaiian culture and community, focusing primarily

on academic achievement, and using methods mostly defined and directed by the teacher. Some incorporate universal Hawaiian values like 'ohana and use talk story methods, and also view social growth as an important part of their job. Still others integrate some Hawaiian practices, like mele (song) or oli (chant), encourage peer teaching and learning, and view teachers' roles to include building cultural identity and self-worth. The most intensely culturally relevant teaching reported included those rooted fundamentally in Hawaiian beliefs, using intergenerational learning, student-directed community engagement, and feeling a strong sense of kuleana (responsibility) for ensuring students' cultural identity and value of place.

In turn, for family and community involvement, some teachers reported little expectation of relationships with students outside the usual open house events. Others extend their contact with families to include lots of feedback about positive and negative student matters. Still others reported significant effort to integrate the 'ohana and community into the learning environment and work on establishing relationships even outside of school.

Teachers in all three school types used cultural content, the DOE, private and charter schools reporting higher averages respectively. This area includes culture-based curriculum and materials, place-based content and strategies, and the overall philosophy about culture at school. The continuum ranges from teachers who keep their instruction very neutral and mostly rely on vendor-developed textbooks, benchmarks, and materials (often the case in restructuring public schools), to those that integrate local examples and community-based learning opportunities, or teachers on the upper end of the culture-based distribution who specifically embed Hawaiian knowledge, practices, and place into the content, and/or who ultimately teach to preserve and perpetuate Hawaiian culture within the global context.

The smallest differences appeared in the teacher practices around assessment, data, and accountability. Fewer teachers reported solely using multiple-choice tests, others use assessments that involve projects or performances, examine creative problem solving and knowledge application in diverse situations, and finally, some report assessment practices that measure student learning in ways that are culturally purposeful and valuable to the community and Hawaiian culture.

Overall, as expected, compared to teachers in DOE schools and the private schools, charter school teachers report higher use of culture-based practices in all five areas on average. They also reported highest use of the CREDE best practice standards. Also consistent with Hypothesis 1, private school and DOE teachers share slightly

lower summative values, although the former report higher use of culturally relevant practices on average than DOE teachers in the context and language continua. DOE teachers report slightly higher use of the CREDE best practices and family/community involvement practices.

Given our understanding of the substantial differences in educational approaches and pedagogies among schools, it is important to examine the data further with respect to culturally relevant teaching within the disaggregated school types. The results are shown in Table 3. Significant differences emerge distinguishing teaching practices in conventional DOE schools from those teaching in Hawaiian language (kula kaiapuni) across all five continua and CREDE teaching practices. In addition, analysis of teachers' self-reported practices reveals statistically significant differences between charter school types, (Western-focused, Hawaiian-focused, and Hawaiian medium) that otherwise were unobservable.

TABLE 3 Average summative values by continuum and disaggregated school type

| | Conventional DOE | Kula Kaiapuni (Immersion) | Private | Western focus charters | Hawaiian focus charters | Hawaiian medium charters | All schools combined |
|------------------------------|------------------|---------------------------|---------|------------------------|-------------------------|--------------------------|----------------------|
| Summative Value* | | | | | | | |
| % Content (n=597) | 33.1 | 42.2 | 34.5 | 33.3 | 42.4 | 46.0 | 35.7 |
| % Context (n=596) | 58.2 | 75.5 | 63.8 | 55.4 | 74.0 | 79.8 | 63.3 |
| % Assessment (n=592) | 68.7 | 81.0 | 72.6 | 77.0 | 77.9 | 85.2 | 72.5 |
| % Family & Community (n=598) | 57.0 | 68.8 | 56.4 | 57.2 | 71.2 | 84.1 | 60.8 |
| % Language (n=598) | 31.3 | 85.4 | 49.8 | 28.7 | 66.7 | 89.4 | 45.6 |
| % CREDE (n=593) | 70.2 | 78.5 | 67.5 | 68.9 | 78.2 | 84.3 | 71.7 |
| N | 307 | 22 | 144 | 22 | 60 | 45 | 600 |

*Standardized to 100% to allow comparisons across the continua

Overall, there are many similarities between schools. The greatest area of similarity appears in the average summative values for data and assessment, although DOE school teachers most frequently reported using conventional Western methods (e.g., paper and pencil). In addition, the data suggest that the conventional DOE, private, and Western-focused charter schools share fairly similar profiles in culturally relevant teaching strategies reported by teachers. On the other hand, the Hawaiian immersion kula kaiapuni and the two Hawaiian charter school types indicate similar patterns of higher average use of culture-based practices, plus higher values in the CREDE best practices items. Both Hawaiian language medium settings show high language values, as would be expected.

With respect to differences, Table 3 shows that culturally relevant teaching in Hawaiian immersion kula kaiapuni schools is much greater than in conventional DOE schools in all five continua, plus the items indicating CREDE best practices. Among charters, summative values generally are higher in Hawaiian-focused and Hawaiian-medium charters compared to Western charters for all five continua, plus the CREDE items. The environments that support the greatest amount of highly relevant Hawaiian cultural education appear to be the Hawaiian-medium charters, with teacher use in the 80th percentile on four of the five continua (100 is the maximum). The kula kaiapuni and Hawaiian-focused charters follow closely with values hovering in the 70th percentile in most of the continua.

Intensive Use of Culture-based Practices

The next analysis summarized in Figure 5 provides insight into the varying degrees of cultural relevance across schools, showing the percentage of teachers that report intensive use of culture-based practices within each school type. Intense use is highest in Hawaiian language education settings (recall, though, that use of Hawaiian language is not a required element of intense use). Roughly 74% of the Hawaiian medium charter teachers and 55% of the 22 kula kaiapuni teachers fall into the "intense overall" category. None of the 22 Western charter teachers appear in that category. Again, these findings should be considered with caution, given the small sample sizes.

FIGURE 5 Percentage of "Intense Overall" users by disaggregated school type

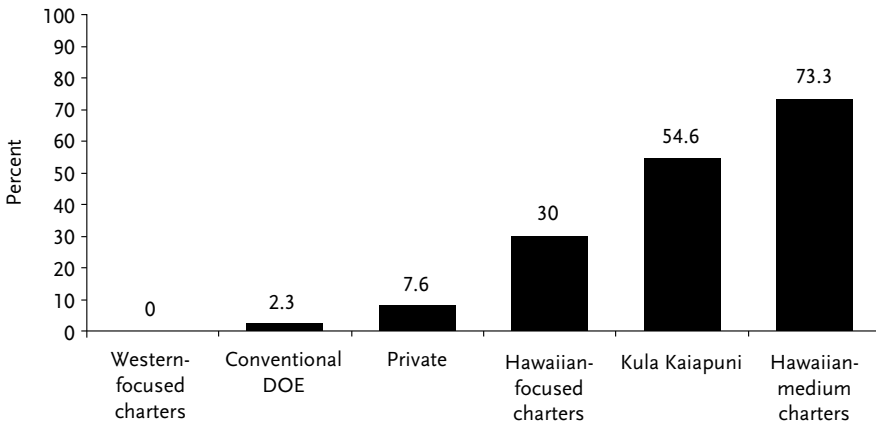


Table 4 presents data used to examine our second hypothesis that highly relevant cultural strategies are not the exclusive continuum of "within culture" teachers, where within culture is restricted to Native Hawaiian ethnicity. Relative to non-Hawaiian teachers, we find that a higher percentage of teachers who report Hawaiian or part-Hawaiian ethnicity also fall into the intense user category, with the highest reported use of culturally relevant practices across all five continua. However, many non-Hawaiian teachers report intensive use of culture-based practices; one in every five non-Hawaiian teachers intensively uses culturally relevant practices in their teaching. According to one of these educators, among many other good reasons, she sees that for her students in a global society, "having strong cultural foundations is the springboard to cultural relations globally."¹² Other studies have found similar results, where non-native teachers used cultural strategies and believed it was important to teach tribal culture alongside "academics" (Cleary & Peacock, 1998; Lipka et al., 2005).

As might be expected, the biggest differences appear in the intensive use of language where more Native Hawaiian teachers have grown up speaking or have pursued Hawaiian language studies with the depth required to use it for teaching on a daily basis. The area of greatest overall intensive use is the assessment continuum. Conversely, and as also might be expected, there are many Native Hawaiian teachers who do not use culture-based practices intensively in their work with students.

One question raised by these data is how environment affects teachers' intensive use of culturally relevant practices. While we might expect that all teachers in Hawaiian-focused schools more often use culture in teaching and learning, the

data also revealed that non-Hawaiian teachers also reported intensive use in more conventional or Western contexts. In analyses not shown here, we find examples of non-Hawaiian teachers that intensively use culturally relevant practices in all school types except participating Western charters. They are most frequently found in Hawaiian culture and language-focused schools where the environment encourages culturally grounded approaches. These findings are consistent with the idea that supportive environments help “out of culture” teachers benefit from culturally relevant teaching practices.

TABLE 4 Teachers reporting intensive use of culture-based practices by ethnicity

| | Non-Hawaiian | Hawaiian |
|--|--------------|----------|
| Percent of group that are Intensive Users* | | |
| Content | 15.0 | 47.0 |
| Context | 11.7 | 37.7 |
| Assessment | 23.6 | 50.7 |
| Family & community | 7.6 | 25.6 |
| Language | 6.2 | 44.7 |
| Overall** | 4.9 | 28.8 |
| N | 368 | 215 |

*Intense users defined as the highest quartile of summative values for each continuum

**Overall intensive users include teachers intensively using strategies in 4 of the 5 continua

Examples of Culture-based Practices from Teachers

In a series of open-ended questions, teachers reported a variety of practices that they have found effective in working with students. A qualitative analysis of the teacher data showed culturally relevant approaches were used in three common areas of their work: identifying content, structuring the learning environment, and assessing students’ knowledge. The first area was addressed through pilina ‘ohana and pilina kaiāulu, family and community integration, respectively. Teachers who embrace culturally relevant teaching and learning went beyond providing family members with information on how they could support their child’s learning at home and instead took steps to integrate ‘ohana and community members into the learning experience as curricular resources. For example, some teachers require students to interview family members for unique information such as genealogy,

family stories, and behavioral habits that is then used to illuminate class topics concerning history or health. In another instance, a lesson about recycling and water conservation was given added relevance when students were tasked with creating a sustainability plan with their family describing how they, as a unit, can reduce waste, increase recycling, and conserve water. In a similar way, teachers report success when they invited community members to share their knowledge and insight with students. For example, a senior community member would visit a language arts class three times a week to talk about the history and significance of Wahiawā, O’ahu. In turn, students took what they learned and created a song celebrating their community and later performed it at a school event.

In addition to seeing the value of framing family and community as resources, teachers find it beneficial to structure their students’ learning environment in ways that are culturally relevant and purposeful. Teachers accomplish this goal by designing lessons and projects focusing on mālama ‘āina (caring for the land), kōkua kaiāulu (helping the community), and ola pono (living a balanced life). For instance, in a class project called the “Ka Wai Nui Marsh Field Study,” students learned principles of biology and natural resource management by measuring changes taking place at their local wetland area. They gained a deeper understanding of the impact at the marsh when they heard stories about historic settlement patterns and traditional land use that sustained a large native population for centuries. Some teachers require students to undertake service learning projects that promote community well-being, such as caring for kūpuna (elders) at the neighborhood rest home or organizing clean-up efforts at the local beach park. Similarly, teachers reported that when learning takes place at cultural sites like lo’i kalo (taro fields) and loko i’a (fishponds) students are sometimes better able to grasp abstract concepts regarding science and technology, which can help further develop life skills and career interests.

Teachers also described how they would assess their students’ knowledge and skills in culturally meaningful ways. From a Hawaiian perspective, a common method of assessing knowledge is through hō’ike (performances). To increase cultural relevancy, teachers create opportunities for their students to demonstrate what they have learned in group or solo performances. For example, students are taught about lunar cycles, agricultural tools, and planting techniques and then they are asked to design and build a māla, or garden, at school. Later in the year, the garden can be harvested and food shared on Lā ‘Ohana (family day at school). Another successful assessment strategy centers on haku (original compositions) where students create something new and often personalized to represent their learning. Examples of haku are found in assignments that involve writing poems

and stories or tasks requiring students to encapsulate their knowledge with artwork, song, or dance. One teacher described how students worked together to create an iMovie documentary about their school, which was later shown at a conference of educators.

The examples above cut across subject areas and grade levels, indicating that teachers can and do create effective spaces for culture-based teaching and learning. Table 5 summarizes seven broad and integrated themes that emerged from a qualitative analysis of the teacher data. Together they suggest what culturally relevant education might look like when positioned in Hawai'i. Moreover, the themes link up well with conventional best practices that show positive results in engaging students and motivating their learning.

TABLE 5 Teacher examples of culture-based practices aligned with best practices

| Theme | Description | "Best Practice" |
|----------------|--|--|
| Pilina 'Ohana | Family integration where parents are seen as a child's first teachers | Active participation of family members in educational activities |
| Pilina Kaiāulu | Community integration informed by a Hawaiian sense of place | Using the community as a setting for student learning |
| Haku | Original compositions imbued with a person's experience and spirit | Rigorous assessments accounting for a range of competency and skills |
| Hō'ike | Performances requiring multi-level demonstrations of knowledge and/or skills | |
| Mālama 'Āina | Land stewardship focusing on sustainability and a familial connection | Place-based and service learning projects promoting community well-being |
| Kōkua Kaiāulu | Community responsibility embodying the Hawaiian value of lōkahi (unity, balance) | |
| Ola Pono | Values and life skills that synthesize Hawaiian and global perspectives | Career planning and preparation for global citizenship |

But do these practices engage students and enhance their love for learning? Although this article focused on exploring teacher practice, the early answers to this question indicate a strong yes: culture-based, relevant teaching promotes positive student outcomes. Specifically, our analyses of data from the middle and high school students of participating teachers in this study reveal positive

relationships between increased use of culturally relevant practices and outcomes such as students’ cultural knowledge and practice, community attachment and stewardship, and school connections. Strictly for the purposes of illuminating the relationships, Table 6 shows student responses on select items for two groups of teachers: those with one or more teachers that were highly intensive users (those in the upper quartile in the enacting column in 4 out of 5 continua) and those whose teachers were minimal users (not appearing in the upper quartile in the enacting column of any of the culture-based continua). Note that of 600 participating teachers, 53.5% fell into the minimal user category and 13.5% fell into the highly intensive user category. The student data in this table are limited to Hawaiian youth, who comprise the largest single ethnic group in the sample and in the state’s public schools, according to the U.S. Census 2010. Private schools were eliminated from this analysis to reduce selection bias. All differences are statistically significant.

TABLE 6 Select student outcomes by teacher’s use of culture-based practices

| % of Hawaiian students that agreed | Teacher’s Reported Use | | |
|---|------------------------|-----------|---------|
| | Minimal | Intensive | P value |
| 1. Cultural Knowledge and Practice | | | |
| I have spent time trying to find out more about Hawaiian history, traditions, and customs | 57.2 | 82.6 | <.0001 |
| I am able to speak Hawaiian well | 7.1 | 66.7 | <.0001 |
| 2. Community Attachment and Responsibility | | | |
| I know makani (wind) and/or ua (rain) names for my community or district* | 1.6 | 22.4 | <.0001 |
| I have worked to protect the environment in my community** | 32.0 | 71.0 | <.0001 |
| 3. School relationships | | | |
| Many of the people at my school are like family | 59.7 | 88.1 | <.0001 |
| My teachers go out of their way to help me | 47.8 | 74.2 | <.0001 |

All percentages reported combine “Agree” and “Strongly Agree” except * which combine responses “Few” and “Many” and ** which represents having done so “More than once.”

Cultural knowledge and language clearly are areas of greater proficiency among students of teachers who intensively use culture-based practices. These students also are more likely to know stories and facts about their communities and demonstrate higher levels of active civic responsibility. They reported multiple occasions of working to protect the environment in their community (reflecting *mālama 'āina*, a treasured value and practice in Hawaiian culture). Perhaps most importantly, students exhibited exceedingly high levels of trust and connection to their schools. This outcome is exceptionally powerful because many of these students come from families with low socioeconomic status that have experienced multiple generations of being marginalized in public schools. The initial bivariate analyses showed compelling correlations that were confirmed in subsequent multilevel regressions showing positive relationships to both academic and socio-emotional education outcomes, controlling for mitigating factors (see Kana'iaupuni et al., 2011).

PUTTING THE RESEARCH INTO PRACTICE

The call for cultural relevance in education is certainly not a new phenomenon. According to Demmert and Towner (2003), the first mention of it appears as early as 1928 in a report to the Secretary of the Interior published by the Brookings Institute, the Meriam Report (Meriam, 1928). Some 80 years later, the present study joins the plethora of scholars, educators, and parents who have called for culturally relevant teaching and learning over the years (see Castagno & Brayboy, 2008; Swisher & Tippeconic, 1999). Based on this and other research, we argue that teachers can and must make learning culturally meaningful and purposeful to native children and their communities by respecting and honoring the home culture in learning with respect to the heritage language, family and community involvement, instructional content and context, and authentic assessment.

The results of this first set of analyses from the HCIE study provide a number of useful insights and hold implications for a broad range of educational policies, programs, and research within and beyond the state of Hawai'i. Most importantly, the study improves our understanding of culture-based education practices from multiple and overlapping perspectives. Building on our theoretical model of how culture affects educational outcomes, the analysis seeks to understand teachers'

Enhancing one's cultural relevance:

- Educate with aloha (love, compassion).
- Explore your own culture and language. Reflect on how this knowledge influences teaching style, reading material selection, classroom activities.
- Participate in ongoing professional development on effective strategies for educating children in culturally and linguistically diverse classrooms.
- Learn about family, community, and places as valuable resources to inform teaching and learning; engage their expertise and significance.
- Build relationships and respect by learning about the prevalent cultural beliefs and values of your students.
- Respond in a positive and affirming way to the cultures, languages, and interests of all children through classroom discussions and interactions with parents or caregivers, demonstrating that cultural and language differences are resources and not deficits.

educational practices across various school types and allows readers to re-examine pre-existing notions about culturally relevant education. What emerges from the findings is a better understanding of relevant education in both theory and practice.

Specifically, based on the model and definition presented in this article, the data provide some unique insights into the range of culturally relevant practices that educators use to engage students in the teaching and learning process. The results indicate support for two of our three hypotheses. We find that highly relevant teaching occurs in each of the participating school types and that it is most commonly found in environments grounded in culture-based education. Second, we find that intensive use of relevant practices is the exclusive domain of no one single ethnic group. Teachers of many different ethnicities and cultural backgrounds recognize the advantages of cultural relevance, reporting a variety of ways that help them connect with their students on a daily basis.

However, the findings were inconsistent with the third hypothesis; that culturally relevant teaching practices come at the cost of conventional best practices. Importantly, the results show that teachers in strong culture-based environments are more likely to do both. That is, they use the best practices defined in Western convention and they additionally draw upon culture to enhance the learning environment for their students. These results suggest that culture-based teaching and learning can complement conventional best practices in teaching (or vice versa). They also suggest that teachers in culturally rich school settings stretch above and beyond conventional best practices to deliver highly relevant education that stimulates and engages children and their families. Some would describe this stretching as education with aloha, where loving and nurturing the whole child is an educators' first and foremost job; all else pales in comparison. Finally, consistent with prior research on the impact of culture-based

education, our preliminary analyses indicate positive results for Native Hawaiian children. Future research will investigate and report on these analyses more systematically, including achievement outcomes.

The research findings suggest several implications for teaching and learning. Among them are some suggestions that teachers and administrators may employ to build their repertoire of culturally relevant education practices (see sidebar).

A commonly neglected area where culture must be considered is in instructional design and planning. Teachers must understand how to familiarize themselves with the learners' cultures throughout the instructional design, implementation, and evaluation process. One recommendation is to engage a cultural expert as part of the design team (Thomas, Mitchell, & Joseph, 2002; Young, 2008).

In terms of broader policy and program implications, it is apparent that recent national education policies have failed to recognize the importance of language and culture for native children. Yet the consequences of this failure are significant and replete in the well-worn trail of low achievement, low socioeconomic status, and poor health of this nation's indigenous populations. One size fits all education models make no sense at the community level, where scripted approaches could be replaced by those that harness the wonders, the fullness, and the richness of cultural practices, values, and knowledge. These factors have yet to be fully leveraged and supported in the educational process. There must be room for communities to guide the education of their children to ensure relevance and meaning in both outcome and substance.

The results also have implications for greater diversity in the way higher education institutions prepare educators. Helpful frameworks exist defining the key elements of effective teacher education for diversity

- Use the cultural language(s) of the students in instruction and learning.
- Promote the value of storytelling by encouraging students to become storytellers and by asking parents, grandparents, and other elders in the community to share their life stories.
- Provide instruction to students to validate their own culture while also teaching them diverse skill sets that they need for success in a global society.
- Alter instruction to include individual, small group, and cooperative learning experiences. Present instructional activities in various formats to include all children's learning styles.
- Reflect on and develop ways to assess students' learning and mastery in real world applications and in ways that are culturally meaningful and purposeful.
- Always have high expectations of all of your students.

(NCREL, 1997; Zeichner, 1993). The North Central Regional Education Laboratory identified twelve elements in an organizational framework for “Educating Teachers for Diversity,” which is designed to support teachers in a holistic manner.

Educating Teachers for Diversity

- **Element 1:** Pre-service education students are helped to develop a clearer sense of their own ethnic and cultural identities.
- **Elements 2 and 3:** Pre-service education students are helped to examine their attitudes toward other ethnocultural groups. They are taught about the dynamics of prejudice and racism and how to deal with them in the classroom.
- **Element 4:** Pre-service education students are taught about the dynamics of privilege and economic oppression and about school practices that contribute to the reproduction of societal inequalities.
- **Element 5:** The teacher education curriculum addresses the histories and contributions of various ethnocultural groups.
- **Element 6:** Pre-service education students are given information about the characteristics and learning styles of various groups and individuals. They are taught about the limitations of this information.
- **Element 7:** The teacher education curriculum gives much attention to sociocultural research knowledge about the relationships among language, culture, and learning.
- **Element 8:** Pre-service education students are taught various procedures by which they can gain information about the community represented in their classrooms.
- **Elements 9 and 10:** Pre-service education students are taught how to assess the relationships between the methods they use in the classroom and the preferred learning and interaction styles in their students’ homes and communities. They are taught how to use various instructional strategies and assessment procedures sensitive to cultural and linguistic variations, and how to adapt classroom instruction and assessment to accommodate the cultural resources that their students bring to school.

- **Element 11:** Pre-service education students are exposed to examples of the successful teaching of ethnic- and language-minority students.
- **Element 12:** Instruction is embedded in a group setting that provides both intellectual challenge and social support.

Finally, it is clear that more research is needed to address the gaps in our understanding about culturally relevant, culture-based, and culturally responsive education. There is great need to explore the effects of the continuum of cultural approaches in statistically rigorous ways. Some specific research questions for this and future projects include:

1. What can we learn from traditional culture-based education strategies in developing and applying innovative schooling environments, models, and skill sets designed for the future?
2. What impact do culturally relevant and culture-based education strategies have on the educational achievement and behavioral outcomes of indigenous students?
3. What factors mediate the relationship between culture-based education and student achievement/behavior (e.g., community connections, student engagement, cultural identity, and self-worth)?
4. Under what conditions is culturally grounded education most conducive to success and achievement for indigenous students (e.g., components including language, protocol, arts, values, traditional knowledge; systems including bilingual education, immersion education, school-within-school models, indigenous-only schools, mixed schools, etc.)?
5. What possibilities does culture-based education bring to the survival and vitality of indigenous cultures throughout the world? To human diversity? To environmental sustainability?

Ha'ina 'ia mai ana ka puana, and so the story is told.

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ABOUT THE AUTHORS

Shawn Malia Kana'iaupuni is the director of Kamehameha Schools' (KS) Public Education Support Division, prior to which she established and guided the research and evaluation arm of KS (aka PASE) and founded *Hūlili: Multidisciplinary Research on Native Hawaiian Well-Being*. She is a former faculty member of the University of Wisconsin–Madison, Race and Ethnic Advisory Committee member of the U.S. Census Bureau, and board member of the National Indian Education Association Board and the Native Hawaiian Education Council of the U.S. Dept. of Education. She is from Pūpūkea, O'ahu, and currently resides with her husband, Bryan Naff, and two children, Nainoa and Malialani, in Kailua. Kana'iaupuni (KS '83) received her BA in Public Affairs from the University of Denver, MA and PhD in Sociology from the University of Chicago, and MBA from the University of Hawai'i at Mānoa. Brandon C. Ledward, PhD, directs the 'Āina-Based Education Department at KS.

NOTES

1 A note on terms: In this research, we use the terms *culture-based* and *culturally relevant*, where the former represents a holistic and comprehensive application of culturally relevant education. Specifically, culture-based refers to educational approaches that are grounded in a particular cultural worldview, though not necessarily to the exclusion of mainstream culture (for prior research in this area see Cornelius, 1999; Demmert & Towner, 2003; Castagno & Brayboy, 2008; Kana'iaupuni & Kawai'ae'a, 2008). Culturally responsive is another term used by scholars who argue that a "firm grounding in the heritage language and culture indigenous to a particular tribe is a fundamental prerequisite for the development of culturally healthy students and communities associated with that place, and thus is an essential ingredient for identifying the appropriate qualities and practices associated with culturally responsive educators, curriculum and schools" (Alaska Native Knowledge Network, 1998; see review by Castagno & Brayboy, 2008).

2 For example, see the information on high-quality teacher preparation programs by the National Commission on Teaching and America's Future at http://www.nctaf.org/strategies/assure/quality_teacher_preparation_programs.htm

3 The full set of authors includes K. Tyler, A. Uqdah, M. Dillihunt, R. Beatty-Hazelbaker, T. Conner, N. Gadson, A. Henchy, T. Hughes, S. Mulder, E. Owens, C. Roan-Belle, L. Smith, and R. Stevens.

4 For a comprehensive discussion of how teachers can effectively employ multicultural pedagogies and learning style approaches in the classroom, see literature review by Fuchigami (2007).

5 Being beaten for speaking Hawaiian was not uncommon, see for examples Nākoa (1979) and Thompson (2007). One story shared by Mrs. Nākoa talks about that first day of school. Her grandmother told her to be careful and not use Hawaiian as it was not permitted. Unfortunately, Mrs. Nākoa did not know any English or realize that she had an English name and was slapped by the teacher on the first day of school for not responding to her name. The story focuses on Mrs. Nākoa's resilience as a child; she had learned Japanese from a neighbor woman and responded defiantly to the teacher in Japanese, which her classmates understood but not her teacher. Another story relayed by Mr. Maka'ai describes

his school experience: "I was punished for speaking Hawaiian in school. You had to hold up a rock and stand in front of the teachers and students with the words, 'I am not going to speak Hawaiian'" (Maka'ai, Shintani, Cabral, & Wilson, 1998, p. 116).

6 Downloaded from <http://www.eduhistory.com/> on August 21, 2007, italics added.

7 In the field of sociology, an ideal type is formed from characteristics and elements of the given phenomena, but it is not meant to correspond to all of the characteristics of any one particular case. Attributable to Max Weber, an ideal type is not meant to refer to perfect conditions, moral ideals, or statistical averages but rather to stress certain elements common to most cases of the given phenomena.

8 Note that the objective of the tool is not to devalue conventional approaches to teaching and learning, but to define and articulate teaching behaviors and philosophies specifically from a Hawaiian indigenous education perspective. For this reason, when the questionnaires were developed from this framework, all items were designed to collect the frequency of each behavior defined within each cell of the continua. In other words, a teacher may practice an item in the None column not at all, sometimes, or a lot. That same teacher may use a strategy in the Enacting column not at all, sometimes, or a lot. With this design, the resulting tools can capture highly individualized uses of culturally relevant teaching practices.

9 For more information, see <http://crede.berkeley.edu/index.html>.

10 To protect the anonymity of these schools, specific names/locations are not disclosed.

11 Data collection also included several thousand students of these teachers, and their parents, to be the subject of future publications.

12 Personal interview by Kana'iaupuni, Spring 2007.

APPENDIX

TABLE A1 The Hawaiian Indigenous Education Rubric (HIER): Full detail

| I. Language: Use of Heritage Language in Teaching | | None | Emerging | Developing | Enacting |
|--|---|--|---|--|----------|
| Critical indicators | | | | | |
| (a) Integration of Hawaiian language in class | I do not have use for Hawaiian language in my class. | I use simple Hawaiian words and/or songs to expose my students to Hawaiian language. | I speak and display Hawaiian language in the learning environment, using phrases and simple language exchanges. | I teach and communicate with my students in 'ōlelo Hawai'i (Hawaiian language). | |
| (b) Hawaiian language materials and resources (e.g. books, electronic media, audio/visual technology, kūpuna, community members) | I have no Hawaiian language materials or resources in my classroom. | I occasionally use Hawaiian language materials in my teaching. | I use Hawaiian language materials in my teaching fairly often. | I use Hawaiian language materials in my teaching all the time. | |
| Philosophy on language | Hawaiian language is less relevant to core academic subjects like math, English, science, and social studies. | I believe it is important for all students to be exposed to Hawaiian language. | My teaching is grounded in the belief that all students should have a basic level of competency in the Hawaiian language. | My teaching is grounded in the belief that all students should be proficient in Hawaiian language to achieve our vision for a Hawaiian-speaking community. | |

| II. 'Ohana and Community Involvement | | None | Emerging | Developing | Enacting |
|---|--|---|--|---|----------|
| Critical indicators | | | | | |
| (a) Integration of 'ohana/community in curriculum | Families are so busy that I don't expect them to actively contribute to my class or my students' learning. | I provide students' family members with information about ways they can support their child's learning at home. | I develop homework assignments and activities that require the active participation of family members. | I integrate 'ohana, community members, and kūpuna into the learning experience. | |
| (b) Communication between 'ohana and teachers | Most of my contact with students' families occurs through open houses and school events. | I contact family members (e.g. by phone, in person, by e-mail) when their children are having problems in my class. | I frequently contact family members about a variety of student matters, both good and bad. | I work closely with 'ohana to support their children's growth and success in and out of school. | |
| (c) Relationship between 'ohana and teachers | As a teacher, my relationship with students does not extend beyond the classroom. | I talk with my students about their home lives but maintain appropriate physical and emotional boundaries. | I invite students' family members into the learning environment to create a sense of 'ohana. | I work hard to get to know my students, their families, and their community through interactions outside of school. | |

| III. Content: Culture- and Place-Based | | None | Emerging | Developing | Enacting |
|--|---|---|--|---|----------|
| Culture-based | | | | | |
| Critical indicators | I use vendor-developed textbooks and materials for my class to ensure that the content and quality meet state standards or other benchmarks and guidelines. | I use readily available curricula and materials that interject Hawaiian or “local” examples where relevant. | I use culturally appropriate curricula and materials that include some Hawaiian cultural content. | I embed Hawaiian knowledge, practices, values, behaviors, language, and spirituality into the content and materials of my class. | |
| (a) Curriculum | | | | | |
| (b) Content | | | | | |
| Place-based | | | | | |
| Critical indicators | I use textbook-based lectures and discussions in my class. | I use hands-on learning activities outside the classroom. | I relate my coursework and content to the local (but not necessarily Hawaiian) community and my students apply what they have learned to community settings. | I use the community as a setting for student learning that is responsive to community needs and grounded in the Hawaiian knowledge, practices, and history associated with a place. | |
| (c) Experiential | | | | | |
| (d) Community-based | | | | | |
| (e) Place-based | | | | | |
| Philosophy on culture in class | I try to keep my class neutral and free of cultural references so that no students feel left out. | I design my class to support the diverse cultural backgrounds of my students. | I incorporate Hawaiian culture in my teaching to better engage students. | My ultimate goal in working with students is to preserve and perpetuate Hawaiian culture for generations to come. | |

| | None | Emerging | Developing | Enacting |
|---|--|---|--|--|
| IV. Context | | | | |
| Critical indicators | | | | |
| (a) Culturally grounded context | My teaching methods and delivery have little to do with Hawaiian culture, practices, values, or beliefs. | In my teaching, I incorporate universal values, couched in Hawaiian terms such as 'ohana and lokahi (unity, harmony). | I integrate Hawaiian practices, rituals, and protocol as part of the learning experience for my students. | The learning environment and daily practices of my class grow from my fundamental Hawaiian beliefs and native spirituality. |
| (b) Culturally relevant community of learners | I lead class discussions that give individual students a chance to be heard when called on. | I facilitate student discussions and group interactions using a free-flowing, "talk story" structure that is collaborative in nature. | I encourage students to teach and learn from each other. | I create opportunities for intergenerational learning, where students learn from each other, from teachers, and from kūpuna. |
| (c) Community well-being, <i>kuleana</i> (responsibility) | I define and direct my students' roles and responsibilities. | I teach my students to recognize their responsibilities and the importance of their roles. | I expect my students to recognize and carry out their roles and responsibilities on their own. | I encourage my students to initiate and lead community projects to promote greater community well-being. |
| Philosophy on the role of teacher | My primary goal in teaching is to improve my students' academic achievement. | I am just as responsible for my students' social and emotional growth as I am for their academic achievement. | As a teacher, building cultural identity and self-worth in my students is as important to me as increasing their academic achievement. | I am responsible for ensuring that my students have a strong cultural identity, sense of place, and academic achievement. |

| V. Data and Accountability | | None | Emerging | Developing | Enacting |
|----------------------------------|--|--|---|---|---|
| Indigenous assessment | I use multiple-choice and other paper-and-pencil tests to assess students. | I assess my students by having them engage in projects or performances that: | I assess my students by having them engage in projects or performances that: | I assess my students by having them engage in projects or performances that: | I assess my students by having them engage in projects or performances that: |
| Critical indicators | | | | | |
| (a) Demonstrate knowledge/skills | | (1) Require a range of knowledge and skills. | (1) Require a range of knowledge and skills, AND | (1) Require a range of knowledge and skills, AND | (1) Require a range of knowledge and skills, AND |
| (b) Application | | | (2) Demonstrate a meaningful understanding of the material including the ability to problem-solve and creatively adapt knowledge to different situations. | (2) Demonstrate a meaningful understanding of the material including the ability to problem-solve and creatively adapt knowledge to different situations, AND | (2) Demonstrate a meaningful understanding of the material including the ability to problem-solve and creatively adapt knowledge to different situations, AND |
| (c) Value to community, culture | | | | (3) Are culturally purposeful and useful (i.e., have real value to the community and to Hawaiian culture). | (3) Are culturally purposeful and useful (i.e., have real value to the community and to Hawaiian culture). |

TABLE A2 Detail on teacher characteristics variables

| Variable | Description |
|---------------------------------------|--|
| Age (n=574) | |
| Avg teacher age (yrs) | Mean age |
| % 35 or younger | Combined percentages of "25 years or younger" and "26–35 years" |
| Gender (n=585) | |
| % Female | Percent reporting female |
| Ethnicity (n=582)* | |
| % Hawaiian | "Hawaiian" checked alone or in combination with any other ethnicity |
| % Caucasian | "Caucasian" checked alone or in combination with any other ethnicity |
| % Japanese | "Japanese" checked alone or in combination with any other ethnicity |
| % Other | Any ethnicity other than "Hawaiian," "Caucasian," or "Japanese" checked alone or in combination with any other ethnicity |
| Educational Attainment (n=527) | |
| % BA, BA+ | At least a BA but not attaining a Masters degree |
| % MA or more | Reported education level of Masters degree or higher |
| % Hawaiian degree | Completed a major or minor in Hawaiian language or Hawaiian studies ("n" based on those responding to question of whether or not a Hawaiian language or Hawaiian studies class was taken. Reasoning: if response was "no," then one would not answer question about completing a major or minor in Hawaiian language/studies |
| Tenure at school (n=537) | |
| % 5 years or fewer | Years teaching at current school. |
| % 20 years or more | Years teaching at current school. May include some from conversion charters. |

TABLE A2 continued

| Years of Hawai'i residence (n=581) | |
|------------------------------------|---|
| % 20+ years | Percent reporting living in Hawaii for at least 20 years |
| Subject(s) taught (n=453)* | Many respondents may have skipped this question because the area for response on the survey was small |
| % Math | "Math" written alone or in conjunction with any other subject |
| % English | "English" written alone or in conjunction with any other subject |
| % Science | "Science" written alone or in conjunction with any other subject |
| % History/Social studies | "History/social studies" written alone or in conjunction with any other subject |
| % Hawaiian studies/ language | "Hawaiian studies/language" written alone or in conjunction with any other subject |
| % Other | Any subject other than the above written alone or in conjunction with any other subject |
| % Missing (n=600) | Percent not responding to the question. Included because % missing was so high. |