

Leadership for Indigenous Education: Culture-Based Communication and the Impact On Student Achievement in Hawaii

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In this quantitative correlational research study, the degree to which a school leader's culture-based communication style could predict student achievement outcomes in the Hawaii State Assessment (HSA) in reading and math in: (a) schools with a Native Hawaiian mission, and (b) schools without a Native Hawaiian mission, were examined. The population of the study was all 284 K-12 Department of Education schools in Hawaii and publicly funded charter schools. Within this selected population of K-12 schools, 20 schools and corresponding school leaders were selected from Hawaiian-missioned schools, and 20 from Western-missioned schools. Findings include that culture-based communication style of leaders only influences learner reading scores, where school leaders who use engagement culture-based communication style score significantly high than those who have leaders who use other communication styles. Learners under school leaders who use an accommodating culture-based communication style were likely to score less on reading scores (a decline of 0.28) compared to engaging leaders. The study has implications for school leaders in that communicating with a style that was congruent with the Native Hawaiian community may have a negative impact on student achievement in reading. The conclusions in study might help to close the performance gap by providing insights to indigenous school leaders that support the performance of their students.

Keywords: culture-based communication, Hawaii, achievement, reading, math, school leaders

Introduction

Underachievement is defined by Western educational priorities as a focus on English language reading skills as well as the Western-derived progression of mathematics skills (Carjuzza & Ruff, 2010; Meza, 2015; Parra et al., 2016). Scholars such as Duffy (2006), Hohepa, (2013), Meza (2015), and Apple (2013) challenged this definition as a Western construct of educational outcomes. They asserted that it does not align with many indigenous community definitions of success, which often includes outcomes such as personal as well as social traits and values (for example, language revitalization or community self-determination). Academic underachievement is further captured by the United States Department of Education's National Assessment of Educational Progress (NAEP), which demonstrates variation between Native American and Alaska Native students' performance when compared to their White counterparts, with mean scores of 136 and 160, respectively (Department of Education, 2013).

Other studies add to the argument that a lack of effective leadership and differences in culture-based communication styles of leaders might play a role in the lower achievement of students (Hall, Ainsworth, & Teeling, 2013; Urrieta, 2016). Therefore, leadership in education, and specifically culture-based communication styles might play a significant role in filling the gaps in achievement at a student level (Hall, Ainsworth & Teeling, 2013). Masewics and Vogel (2014) began explaining where this impact might have come from, asserting that a leadership framework that prioritizes social justice and values might better meet the needs of disenfranchised students. Effective leadership is essential to student achievement in school conditions that mirror the overarching indigenous environment, such as poverty, low levels of parent and

community Western educational background, and underfunded school systems (Masewicz, & Vogel, 2014).

In the United States, Indigenous students are underachieving in kindergarten through 12th grade (K-12) academic settings when compared to their non-indigenous counterparts, as demonstrated by lower achievement on standardized tests, lower grade point averages, higher dropout rates, and lower graduation rates (Avoseh, 2013; Faircloth, Alcanter, & Stage, 2015; Harrington & Pavel, 2013; Huaman, 2013; Meza, 2015). The performance gap between indigenous and non-indigenous students varies yet is documented upwards of 30 percentage points on standardized testing (Song, Perry, & McConney, 2014). The underachievement of indigenous students in schools has long-term ramifications, limiting options and perpetuating cycles of poverty, as well as impacting indigenous communities by hampering the self-determination of indigenous people (Fryberg et al., 2013; Harrington & Pavel, 2013; Meza, 2015; Verbos, Gladstone, & Kennedy, 2011).

School leaders in indigenous-missioned schools (schools that formally proclaim either indigenous educational outcomes or teach through an indigenous or culture-based approach) face a daunting task: to not only meet culturally specific priorities of indigenous communities such as self-determination and language revitalization, but to also close the academic achievement gap as measured by Western standardized measures (Hohepa, 2013; Meza, 2015). There are clear strategies that address increasing achievement in reading and math. High-relevance, cultural responsiveness, and culture-based learning have a positive impact on student academic performance (Cheriani, Alimuddin, Suradi, Darman, & Darma, 2015; Montalvo, Combes, & Kea, 2014; Singh & Espinoza-Herold, 2014; Singh, Marsani, Jaganathan, Abdullah, & Karupiah, 2016). Despite this, there is a

scarcity of knowledge around the impact of school leadership on learning in indigenous schools, where community values might come into play differently than in mainstream schools. Therefore, there is a need to explore the relationship between indigenous students' underachievement and the culture-based traits of a school leader, specifically the culture-based communication styles that impact school-level achievement. Two studies in particular showed that leadership indeed interplays with communication style and then outcomes of the institution being lead. Sahlan (2014) highlighted the important role of the school principal in bringing the cultural values among Indonesian populations into the school system to integrate culture and education without losing traditional and religious values. In this particular study, the role of the principal in strategizing the integration of religious culture in the education system turns out to be crucial in predicting student achievement. In addition, an example of the importance of culturally relevant communication was shown by Khalib and Tayeh (2014) who indicated that indirectness was a part of Malaysian cultural communication and within academic settings it had a positive influence on how college students engaged with their academic leaders. Culture, culture-based values, and culture-based communication all impact the effectiveness of leadership; therefore, it is important that the role of these factors in indigenous education be further studied (Cajete, 2015; Gebhard, 2017; Hallinger & Lee, 2013; Higgins, Madden, & Korteweg, 2013; Mackie, MacLennan, & Shipway, 2017; Preston, Claypool, Rowluck & Green, 2017; Russel, 2017; Smith, Larkin, Yibarbuk, & Guenther, 2017).

Methodology

The purpose of this quantitative correlational research study was to examine the degree to which a school leader's culture-based communication style could predict student achievement outcomes in the Hawaii State Assessment (HSA) in reading and math in: (a) schools with a Native Hawaiian mission, and (b) schools without a Native Hawaiian mission. Schools with or without a Native Hawaiian mission could serve a demographic that was predominantly Native Hawaiian by ethnicity (more than 50% Native Hawaiian students) or serve a demographic with a Native Hawaiian minority (less than 50% Native Hawaiian students). If this was the case with the schools used in this study, then this variable would be sub-grouped into two categories in which one would be for schools with more than 50% Native Hawaiian students and another for schools with less than 50% native students.

The criterion variables for this study would be the aggregate scores for reading and mathematics based on HSA testing, and the predictor variables would be the culture-based communication styles of the school leaders, while controlling for the socio-economic status of learners, the teacher quality, the number of years of service as a principal or vice-principal, and the Indigenous mission of school. Two hierarchical multiple linear regression analyses were used to statistically support the hypothesis posited with regard to culture-based communication by principals and its influence on student achievement outcomes in (a) math and (b) reading.

The population of the study was all 284 K-12 Department of Education schools in Hawaii and publicly funded charter schools. Within this selected population of K-12 schools, there was a focus on two main groups of schools: (a) those with a Hawaiian Mission, categorized as Hawaiian-focused

and Hawaiian-immersion schools, which had as part of their mission to teach from a Hawaiian perspective grounded in Hawaiian values, and with an important goal to increase the health of Hawaiian communities; and (b) those without a Hawaiian mission, which were schools that have more Eurocentric priorities with fewer numbers of Hawaiian students, although some of these schools might have up to 50% native Hawaiian students. In this case, these schools might be further split into two categories as stated above. These schools are also non-Asian, as Asian communication style tends to be similar to Native Hawaiian communication styles. Students' aggregate scores in reading and math were taken from the same schools as were the principals chosen for this study.

The software G*Power analysis was used to estimate the sample size required to meet statistical power. The parameters for the tests were as follows for a two-tailed test:

- Effect size = 0.60, to indicate the probability of getting a statistically significant effect (Tabachnik & Fidell, 2007)
- Alpha (α) significance criterion = 0.05
- Statistical power = 0.80, to show that we could expect an 80% chance of getting a significant outcome (Tabachnik & Fidell, 2007)

A sample of 40 school leaders was used, as determined by the G*Power determination test. Leaders were selected through a convenience sampling approach: Forty principals or vice-principals were selected with approximately half coming from Hawaiian missioned schools and half from Western missioned school (Faul, Erdfelder, Buchner, & Lang, 2009). Sampling was significantly impacted by logistics. Hawaii is home to approximately 22 Hawaiian-missioned schools. Nearly all school leaders would need to participate in order for the

sample of 40 to be met. Western-mission schools number over 200. Once Hawaiian-missioned schools were selected, a similar number of Western-missioned schools, with similar characteristics were also chosen, as convenience sampling allows, and school leaders were recruited.

Principals first were solicited via email and phone call, invited to participate and given first right of refusal to do so. If a principal chose not to participate, a vice-principal might be solicited for participation. Hawaii is a small state, and the only state with a single Department of Education. This acts as an advantage in recruitment, as networks were already established to reach out to principals in both Hawaiian and Western-missioned schools.

Materials and Instruments

The correlational, non-experimental design of this study was typical in educational settings, where experimental designs were unreasonable and often not possible (Vogt, 2006). Therefore, this design was optimal in addressing the research questions posed above to potentially address a correlative and predictive relationship between the criterion and dependent variables. To this end, a structured survey instrument was used, as was typical of similar quantitative studies (Vogt, 2006). The Individualism and Collectivism Scale is a 16-item scale coined by Triandis and Gefland (1998) was used to measure four dimensions of collectivism and individualism in cultural contexts. The four dimensions were defined as follows:

- Vertical collectivism – the individual understands that they are part of a collective but are willing to accept hierarchy and inequality within that collective. They understand that community dynamics vary and that there are power structures that exist.

- Vertical individualism - the individual is fully autonomous but recognizes and accepts inequality within the collective.
- Horizontal collectivism – the individual is part of a collective but sees everyone within the collective as equal and does not accept inequality.
- Horizontal individualism - sees the self as autonomous, believing that equality between individuals is the ideal.

From this scale, the Intercultural Conflict Style Inventory (ICS) was conceptualized with the intent to assess how individuals communicate with each other and deal with conflict across cultural lines (Hammer, 2005). A range of psychometric criteria were used to test the items of high cross-cultural reliability and validity so that the scale could be generalized across all cultural constructs internationally including gender, age, and socioeconomic status. In its measurement, the ICS includes Western/individualism and non-Western/collectivist cultural perspectives. Hammer (2005) used a range of culturally diverse studies to test the effectiveness of the inventory. In the 2005 concept study, Hammer used two multicultural samples of culturally diverse respondents and found that direct/indirect and emotionally expressive/restrained scales demonstrated “good fit” when tested with confirmatory factor analysis. Both scales had a reliability measure of $\alpha = 0.73$ and $\alpha = 0.85$ respectively, suggesting that this was generalizable and usable in the ICS. The final inventory had 36 items, with answers on a 9-point scale, ranging from 1= never or definitely no and 9 = always or definitely yes. This instrument was created based on

culture-based traits specifically tied to generalizations of culture through research (Hammer, 2005).

As leadership could be seen as a step removed from student achievement, (leadership set conditions for teaching and learning) four variables were controlled: (1) socio-economics through examining the percentage of free or reduced lunch recipients at each school, (2) teacher quality by examining the percentage of Highly Qualified-rated teachers in each school, (3) leadership tenure, by controlling for number of years leaders spent in their positions and (4) the indigenous mission of the schools.

The ICS was conducted with each of the school leaders in the selected schools and analyzed to identify each leader’s score in emotional expressiveness and directness in communication. The leaders’ scores also plotted them in one of four quadrants identified by the ICS (see figure 1). Student data was collected from the Hawaii State Assessment (Smarter Balance Assessment) statewide tests in reading and math. These tests were taken annually by all students in the publicly funded schools at the end of grades 3, 8 and 11. Scores are standardized and represent a summative score in each of the two areas: (a) reading and (b) math. Controlling for the factors listed above, a multiple linear regression was used to identify the potential influence of leader communication style and student achievement. Here the dependent variables were the (a) reading scores and (b) mathematics scores, predicted by the quadrant the school leader was in. This predictor was categorical with four levels representing each of the four quadrants.

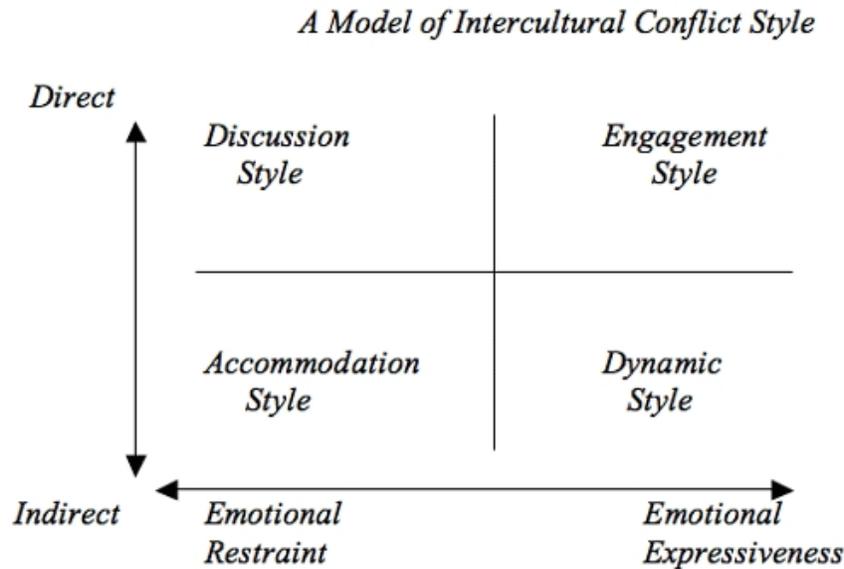


Figure 1. Quadrants of the Intercultural Conflict Style Survey. "The Intercultural Conflict Style Inventory: A conceptual framework and measure of intercultural conflict resolution approaches," by M. R. Hammer, 2005, *International Journal of Intercultural Relations* 29, p. 691. Adapted with permission.

Operational Definitions of Variables

This study involved seven operational variables. These included the quadrant of communication style, HSA test score in reading, HSA test score in math, socio-economics, teacher quality, leadership tenure, and Hawaiian mission of school.

ICS scores. The ICS Survey is a 50-question instrument that gave a score of 0-45 on the continuum of degree of emotional expressiveness vs. emotional restraint. This variable was represented by an interval score of 0-22, which indicated a preference for emotional restraint while a score of 23-45 indicated a preference for emotional expressiveness. The instrument also gave a score of 0-45 on the continuum of the degree of direct communication vs. indirect communication. This variable was represented by an interval score of 0-22, which indicated a preference for indirect communication while a score of 23-45

indicated a preference for direct communication. The two dimensions placed a leader in one of four quadrants: (1) Accommodation, (2) Discussion, (3) Dynamic, or (4) Engagement.

Reading scores. The HSA Smarter Balance Test provided scores in reading as an interval score, ranging from 2000-3000, indicating level of proficiency based on a multiple-day, computer-based performance task, open answer, and multiple-choice test. The score was given in comparison to a state, complex area, and school mean. For the purposes of this study, the scores were analyzed using the state's four ordinal categories of proficiency: (1) not met, (2) nearly met, (3) met, (4) exceeds. This was the dependent variable predicted by leader communication style. This measurement was provided as an ordinal variable.

Math scores. The HSA Smarter Balance Test provides scores in math ranging from 2000-3000, indicating level of proficiency

based on a multiple-day, computer-based performance task, open answer, and multiple-choice test. The score was given in comparison to a state, complex area, and school mean. This was the dependent variable predicted by leader communication style. This measurement was provided as a continuous variable.

Socioeconomics. Socio-economics was controlled by using the criteria established by the federal government family income that qualified a family for free or reduced lunch. This self-reporting mechanism placed families in three categories: (1) income low enough to qualify a child for free lunch, (2) income in a midrange that qualifies a child for reduced lunch, and (3) income sufficient to disqualify a child from either free or reduced lunch. Income levels were determined annually by the federal government and adjusted for geographic variables in cost of living. This measurement was provided as nominal categorical predictor variable with three levels.

Teacher quality. Teacher quality was determined by the percentage of teachers that qualify as Highly Qualified by the State of Hawaii. This qualification indicated that the teacher not only had a valid teaching license, and therefore baseline knowledge of pedagogy and methodology of education, but also had passed content and skills-based exams in all subject areas that they were responsible for teaching. This variable was important to control for as Hawaii was then experiencing a teacher shortage and the 2016/2017 school year started with a teacher-shortage of 600. This measurement was provided as a nominal continuous variable.

Principal's tenure. Principal's tenure was determined by the number of years he/she was present in a leadership capacity in the school. Principals and vice-principals were considered in this study. Even though it was acknowledged that other leaders, such as vice-principals, department chairs, and grade level chairs were important, the principal provided the main leadership in the school. This measurement was provided as a nominal continuous variable.

School mission. The mission of the school was either one that prioritizes explicitly Hawaiian culture-based outcomes, or more narrowly looked at Western-focused outcomes of reading and math. This measurement was provided as a nominal categorical variable with two levels.

A reliability analysis was conducted out of the ICS scale comprising 18 items testing the construct of Leader communication style among Traditional and Missioned schools in Hawaii. Cronbach's alpha showed that the questionnaire to reach acceptable score reliability, Cronbach's $\alpha = 0.906$. This similar reliability and internal consistency is in line with the original ICS score measurements of Cronbach's $\alpha = 0.73$ and 0.85 .

Student achievement scores in Math and Reading are generally low for the sample, with students generally scoring higher in reading than math (Table 3). The sample had a nearly equal representation of leaders from Hawaiian and Mission schools participating with an average of 91.4% teacher quality scale and 56% learners on free lunch. On average, school leaders were in service to schools for six years, and generally used accommodation and discussion as they culture-based communication styles (Table 1).

Table 1
Descriptive Statics of the Respondents

	Mean	SD	<i>n</i>	%
SBA_Math	32.75	19.59		
SBA_Reading	40.43	21.38		
School Leader Tenure	6.38	3.92		
High Quality Teachers				91.37
Free lunch				56.41
Leader Communication Style:				
Accommodating			17	42.50
Discussion			15	37.50
Engagement			8	20.00
Type of School:				
Hawaiian			21	52.20
Traditional			19	47.50

More learners were on free lunch or partially funded lunch in Hawaiian schools compared to traditional schools (Table 2). Learners in Hawaiian schools scored lower in Math (Mann-Whitney $U = 338.50$ $Z = 3.79$, $P < 0.001$) and Reading (Mann-Whitney $U = 333$ $Z = 3.61$, $P < 0.001$)

compared to those in traditional schools. The percentage of quality teachers was higher in Traditional schools than Hawaiian school (Mann-Whitney $U = 328$ $Z = 3.59$, $P < 0.001$), however no differences in the tenure of school leaders was found (Mann-Whitney $U = 206$ $Z = 0.18$, $P > 0.05$, Table 2)

Table 2
Mean Differences in Socio-economic Factor. Leaders tenure and math and reading scores

Type of School		FRL %	Tenure (YRS)	SBA_Math	SBA_Reading
Hawaiian	Mean	67.26	6.57	21.95	29.14
	SD	20.07	4.71	14.84	17.32
Traditional	Mean	44.41	6.16	44.68	52.89
	SD	27.11	2.93	17.34	18.57

Hawaiian schools, leaders predominantly used accommodating culture-based communication style while in traditional schools they predominantly used a combination of accommodation and

discussion style. In traditional schools, the engagement communication style is the least used, but more equally used with the discussion communication style in Hawaiian schools (Figure 2)

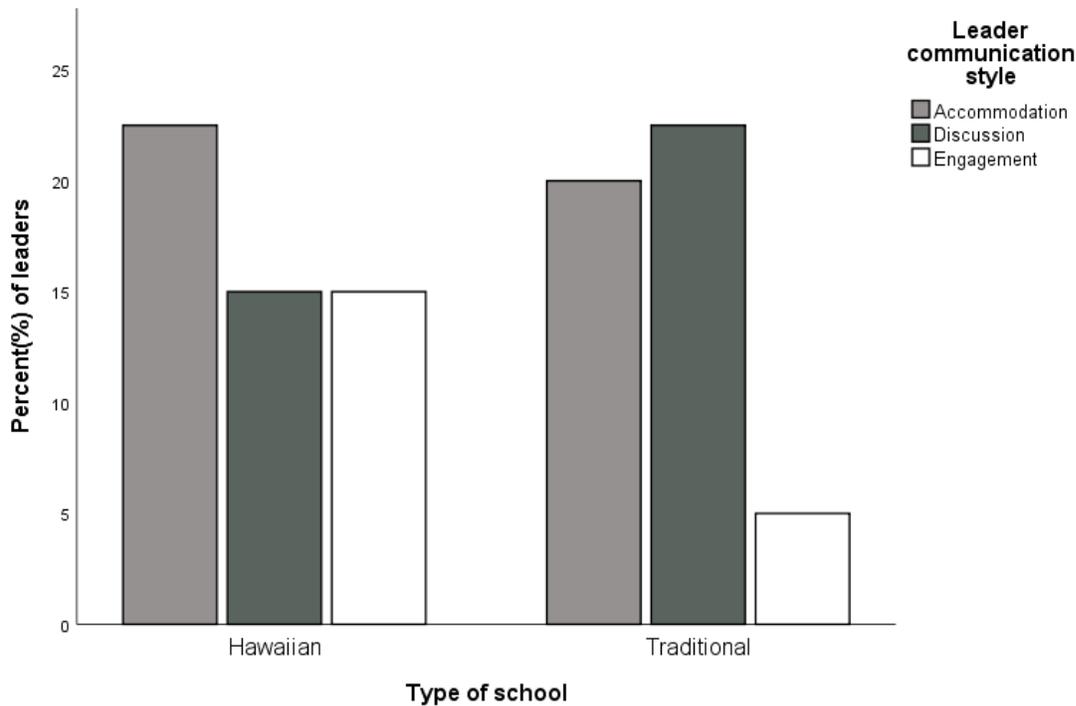


Figure 2. Culture-based Communication Style of School Leaders

The culture-based communication style did not differ among the different styles of communication for Math (Figure 3a) and Reading (Figure 3b), but learners in Hawaiian schools scored lower in their Math and Reading. The scores for learners in traditional schools were consistently higher than those of learners in Hawaiian schools.

The hierarchical multiple linear regression was used to ascertain the influence of school leader's culture-based communication style on learner performance in Math and Reading while controlling for socio-economic characteristics as well teacher quality and

leader tenure. In the first step, type of school was entered followed by leader tenure and teacher quality, the free lunch percent, and lastly the culture-base communication style of the school leader. The variation in SBA_Math significantly explained by all the variables entered into the model ($F(6, 39) = 4.361$ $P < 0.001$), which explained 44.2% ($\text{adj. } R^2 = 0.442$) in SBA Math scores. However, only the type of school significantly predicted performance in SA maths (Table 3) with the scores by learners in Hawaiian schools being 15.25 units/% lower than that of learners in traditional schools (Table 3).

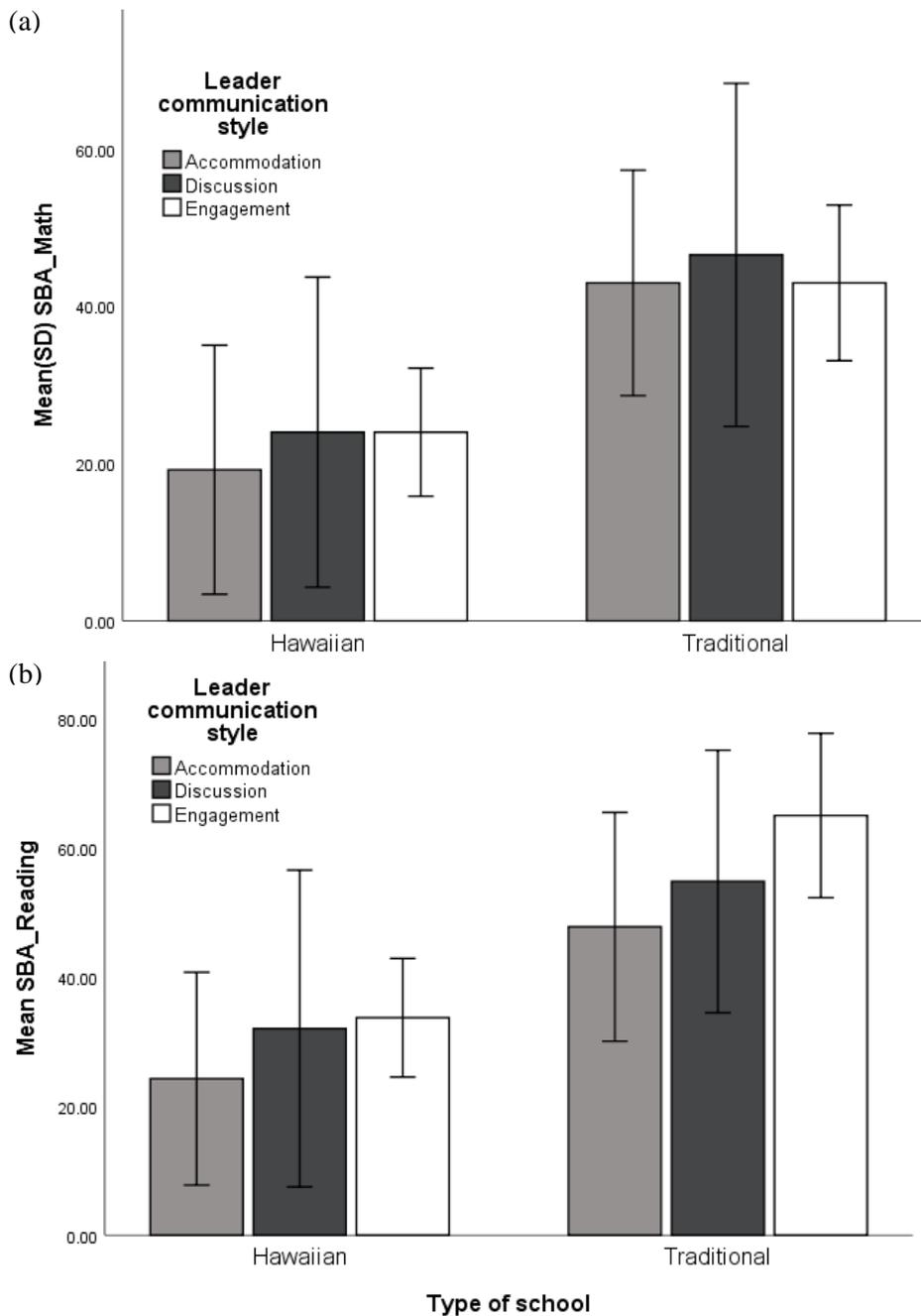


Figure 2. Differences in (a) SBA Math and (b) Reading scores.

On average, children in traditional school scored higher than children in Hawaiian schools in both Math and Reading regardless of the communication style of the school

leader. The socio-economic factors of the learners did not influence their math score achievement nor did teacher quality or tenure of the school leader (Table 3).

Table 3

Hierarchical Multiple Linear Regression, Description of Coefficients Predicting Learner Scores in SBA Math

Variables/Model	B	Std. Error	t	Sig.	95,0% Confidence Interval for B	
					Lower Bound	Upper Bound
Constant	28.10	34.46	0.82	0.42	-42.00	98.21
Type of school^b	-15.27	6.34	-2.41	0.02	-28.16	-2.38
High Quality Teachers (%)	0.29	0.32	0.91	0.37	-0.36	0.95
Tenure (YRS)	0.11	0.75	0.15	0.88	-1.41	1.63
Free lunch (%)	-0.20	0.13	-1.55	0.13	-0.46	0.06
Communication style:						
Accommodating ^c	-5.15	7.27	-0.71	0.48	-19.94	9.64
Discussion	-3.63	7.68	-0.47	0.64	-19.26	12.00

a. Dependent Variable: SBA Math

b. Reference group = traditional school

c. Reference group =Engagement

A similar outcome was found for reading scores, which were significantly predicted by the combination of the variables included in the model (), explaining 49.2 % (adj $R^2 = 0.492$) of the variation in readings scores. Similar to the SBA Math scores, SBA reading scores were found to significantly decline by 13 units/percent in Hawaiian schools compared to mission schools, and

for learners who had free lunch or were subsidized from free lunch, their reading marks decline by 0.28 units, while learners under school leaders who use an accommodating culture-based communication style were likely to score less on reading scores (a decline of 0.28) compared to engaging leaders, Table 4.

Table 4

Hierarchical Multiple Linear Regression, Description of Coefficients Predicting Learner Scores in SBA Reading

Variables/Model	B	Std. Error	t	Sig.	95,0% Confidence Interval for B	
					Lower Bound	Upper Bound
Constant	37.57	33.01	1.14	0.26	-29.59	104.73
Type of school ^b	-13.00	6.07	-2.14	0.04	-25.35	-0.65
High Quality Teachers (%)	0.46	0.31	1.48	0.15	-0.17	1.09
Tenure (YRS)	-0.90	0.72	-1.25	0.22	-2.35	0.56
Free lunch (%)	-0.28	0.12	-2.26	0.03	-0.53	-0.03
Communication style:						
Accommodating ^c	-16.75	6.96	-2.40	0.02	-30.91	-2.58
Discussion	-9.19	7.36	-1.25	0.22	-24.16	5.79

a. Dependent Variable: SBA_Reading

b. Reference group = traditional school

c. Reference group = Engagement

Implications

Student achievement has been attributed to teacher effectiveness, and teacher effectiveness attributed to leadership effectiveness (Allen, Grisby, & Peters, 2015; Faircloth, 2017; Shatzer, Caldarella, Hallam, & Brown, 2014). More specifically, research by Hammer (2009) and Pruitt (1993) illustrated that the manner in which leaders communicated had an impact on the behaviors of those who follow. In this study, the culture-based communication style of leaders was assessed using ICS, placing leaders into one of four quadrants corresponding to the: (1) degree of directness in communication, and (2) degree of emotional expressiveness in communication, along *x* and *y axes* respectively. The categorical independent variable had four

levels representing the quadrant into which the school leader falls. The dependent variable was measured by standardized test outcomes in reading and math.

The first research question asked to what extent (if any) the culture-based communication style of leaders of Native Hawaiian-missioned schools as measured by the ICS, controlling for socio-economics, teacher quality, leadership tenure, and Indigenous mission of school, predicted student academic outcomes as measured by Hawaii State Assessments in reading? Findings indicate that students at schools with leaders who have an accommodating style (indirect and low emotional expression) were likely (Sig. = 0.02) to score less on reading than students at schools with leaders who had an engagement style (direct and high emotional expression) (Sig. = 0.22).

According to the ICS, the accommodating style was associated with indigenous leaders, including Native Hawaiians, or East Asian cultures such as Japanese and Chinese (Hammer 2005; 2009). The engagement style was associated with leaders with a communication style from African American, Greek, French, Italian, Spanish, Puerto Rican, Russian, and Israeli culture (Hammer 2005; 2009).

The results imply that schools were less effectively led to higher reading results on standardized testing when led by leaders who used a style that was congruent with the presumed communication style of the Native Hawaiian community it was established to serve (an accommodation style). To answer question-one, data supports the alternate hypothesis, that culture-based communication style of school leaders, controlling for socio-economics, teacher quality, leadership tenure, and indigenous mission of school, positively predicted student academic outcomes as measured by Hawaii State Assessments in reading. However, the style that predicted a positive impact was not the style of the community the school serves, but a style that was more direct and emotionally expressive. The literature provided a possible explanation for this finding. Godlewska, Schaepli and Chaput (2013) asserted that the very process of Western education of indigenous people created a bias towards Western outcomes and potentially extending to the qualities, values, and styles of the colonizer as well. This may mean that centuries of colonization and disenfranchisement have placed a premium on Western styles, even for Native Hawaiians. This claim was supported by other studies that questioned whether any school system meant to support Western outcomes could be best led by a non-Western leader towards non-Western outcomes (Hanna, 2014; Herbert, 2014; Hohepa, 2013).

The second research question asked to what extent, if any, did the culture-based communication style of leaders of Native Hawaiian-missioned schools as measured on the ICS, controlling for socio-economics, teacher quality, leadership tenure, and Indigenous mission of school, predict student academic outcomes as measured by Hawaii State Assessments in math? Data shows that culture-based communication style did not significantly predict student performance in math. To answer question-two, the data failed to reject the null hypothesis, that the culture-based communication style of school leaders, controlling for socio-economics, teacher quality, leadership tenure, and indigenous mission of school, did not positively predict student academic outcomes as measured by Hawaii State Assessments in math.

The findings show that socio-economics played a role in student performance for reading, but not math, with learners who fell into the free and reduced lunch category, seeing reading marks decline by 0.28 units, yet little impact on math scores. However, the main predictor found by this study was the mission of a school, Hawaiian-missioned or not, with a Significance of 0.02 for math and 0.04 for reading. This created a significant implication for Native Hawaiian-missioned school.

These findings have implications for the field of Native Hawaiian education. Primarily, schools and communities may need to acknowledge, as Hanna (2014), Herbert, (2014) and Hohepa (2013) and asserted, that a Hawaiian-missioned school may not, by design, return comparable standardized test results as a Western-missioned school. Schools with dual missions (to prepare students to achieve in a Western world and to prepare students to increase the self-determination of indigenous communities) may find their resources ineffective to adequately accomplish both goals with excellence. Furthermore, the

study has implications for school leaders in that communicating with a style that was congruent with the Native Hawaiian community, specifically the accommodating style, may have a negative impact on student achievement in reading. While this study is inconclusive as to why this might be, the literature supported the idea that schooling itself has been a tool of colonization (Godlewska, Schaeffli & Chaput, 2013). Finally, the study points to the conclusions that teaching through a Hawaiian-mission may not be a treatment to Native Hawaiian underachievement. Data showed that Native Hawaiian students were underperforming when compared to their non-Native counterparts (Bishop et al., 2012; Harrington & Pavel, 2013). Authors such as Deer, (2014), Gumbo, (2014) and Herbert (2014) pointed out that using culture to engage students may be a treatment to this underachievement. However the data from the study does not support the thesis that leveraging culture (being Hawaiian-missioned) increased test scores in reading and math.

There are limitations with regards to this conclusion. Most significantly, Hawaiian-missioned schools had outcomes in addition to State testing that they were accountable to. Every Hawaiian-missioned school that participated in this study publicly committed (via mission statement, vision statement, or other document) to providing alternative learning outcomes that many schools in this study framed as “equal” in weight and importance to a test result. These alternative outcomes included perpetuating Hawaiian culture, perpetuating Hawaiian language and instilling an appreciation and skill for traditional practices such as *oli* (chant), *mele* (song), or *hula* (dance). Since indigenous education institutions were often founded to advance community and culture-based goals, Hohepa (2013) supported the thesis that time, as well as human and other resources in indigenous-serving institutions were split

between Western goals and culture-based goals, making achievement of both harder and less effective (Hannaa, 2014; Herbert, 2014; Hohepa, 2013; Barrett, 2015). Therefore, schools that saw their primary goal as creating self-determination for indigenous communities may, by definition, see their State test scores fall (Hannaa, 2014; Herbert, 2014; Hohepa, 2013). The data from this study supported the existing literature, specifically that a significant determining factor for student performance on Western standardized testing was the commitment of the school to prioritize those outcomes (Hannaa, 2014; Herbert, 2014; Hohepa, 2013)

Recommendations

Recommendations outlined here are preliminary, with a heavy emphasis on recommendations for future research. The implications of this study focus on a single main proposition, i.e., that a Hawaiian-missioned school might not be a treatment to indigenous student underperformance. Results show that the main variable that predicts student performance among all factors examined in this study is if the school had a Hawaiian mission or not with a Significance of 0.02 for math and 0.04 for reading. Students at schools with a Hawaiian mission performed markedly lower on standardized tests in both reading and math.

With regards to existing literature in the field, the approach to leveraging indigenous-focused education as a preparation for integration into a Western world (and specifically to success on standardized exams) leveraged the idea that the more engaged a student was, the better that student performed (Herbert, 2014; Gumbo, 2014). Furthermore, the theory goes on to propose that indigenous students are engaged in Western schooling through culture-based education that included themes, content, and practices that come from the

student's home culture (Deer, 2014; Herbert, 2014; Gumbo, 2014). This research pointed to the possibility that this may not hold true. A recommendation for further research is to examine if Hawaiian-missioned schools attract students who are already performing lower than students at non-Hawaiian-missioned schools, or if the schools themselves contributed to lower student performance.

Kamehameha Schools (2009) data illustrated that socio-economics played a smaller role in Native Hawaiian student performance than it did in the academic performance of their non-native peers. Reading assessments in the "above average" range showed that Native Hawaiian students designated as free or reduced lunch score 5.4 percentage fewer points than Native Hawaiian students not receiving subsidized lunch (Kamehameha Schools, 2009). At the same time, non-Native Hawaiian students designated as free or reduced lunch score 12.9 fewer percentage points than those not receiving free or reduced lunch (Kamehameha Schools, 2009). This study adds the following contribution to the existing literature: while socio-economics made a difference in student performance (Sig = 0.13 for math and 0.03 for reading), it did not make the same difference as the mission of the school (Sig = 0.02 for math and 0.04 for reading). Therefore, further research is necessary to determine the impact of socio-economics versus mission of school on standardized test results.

Indigenous education, specifically programs found at Hawaiian-missioned schools often had the additional or alternative goal of supporting self-determination of indigenous communities (Hannaa, 2014; Herbert, 2014). To this end, it is quite possible that Hawaiian-missioned schools might be effective. However, there is a need to define these educational outcomes, measure them, and then study the effectiveness of these schools and if they

accomplish their stated outcomes. There is no agreement on which culture-based outcomes should be measured, nor a recommended strategy to assess these outcomes (Hannaa, 2014; Herbert, 2014; Hohepa, 2013; Huaman, 2013). Future research may include examining which outputs and outcomes of Hawaiian-missioned schools most significantly impact the self-determination of indigenous communities.

Leadership style was shown to impact student performance, specifically in reading with leaders who demonstrated that an accommodating style was more likely to see lower student performance in reading. Implications for leaders could be drawn from the work of Hammer (2005; 2009). As communication styles are preferences and not fixed, leadership intervention may increase the direct nature and / or the emotional expressiveness of the communication, which may positively impact student learning and standardized test results in reading. Further research is necessary to explore this question.

There were also lingering questions around the impact of several factors on reading versus math scores. Culture-based communication style had a larger impact on reading than it did on math (for accommodating Sig = 0.02 and Sig = 0.46 respectively). One may speculate that reading rests in the domain of language acquisition which may be more deeply impacted by culture and language styles (Jacob, Cheng, & Porter, 2014). However, this is a pure speculation as current literature has been relatively silent on the topic. Further research ought to address this question in detail.

Conclusions

Indigenous students, and more specifically, Native Hawaiian students have been underperforming when compared to their

non-indigenous counterparts (Bishop et al., 2012; Faircloth, Alcanter, & Stage, 2015; Harrington & Pavel, 2013; Huaman, 2013; Meza, 2015). Hawaiian-missioned schools were more or less responsible for the underperformance, providing either a Hawaiian context for Western-education or adding Hawaiian community and culture-based outcomes to the existing Western outcomes for education (Hannaa, 2014; Herbert, 2014; Hohepa, 2013). Examining what role leadership played in these possible treatments was essential as school leaders impacted student performance (Gebhard, 2017; Russel, 2017; Mackie, MacLennan, & Shipway, 2017; Smith, Larkin, Yibarbuk, & Guenther, 2017). The purpose of this study was to examine the degree to which a school leader's culture-based communication style could predict student achievement outcomes on standardized tests. This study might help to close the performance gap by providing

insights to indigenous school leaders that support the performance of their students.

The findings of this study indicate that the practice of indigenous school leaders as well as several other questions relevant to this subject must be further addressed. Native Hawaiian leaders who utilized an accommodation communication style congruent with their communities may expect this to negatively impact their students' reading scores. However more significant was the incidental finding that a Hawaiian-missioned school itself impacted student outcomes. While it was not clear if this was causative or correlative, it still provides a starting point for future research; important research that may be key in addressing the performance gap for indigenous students, and therefore supporting the self-determination of indigenous communities.

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