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Mathematics and culture in Micronesia

Matemáticas y cultura en la Micronesia

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Abstract

Wheatley and Frieze's book, *Walk Out Walk On*, provides the conceptual framework for an examination of Project MACIMISE, a National Science Foundation funded project that focused on the languages and cultural practices of nine Pacific islands and the state of Hawai'i. MACIMISE, pronounced as if spelled 'maximize', is a 5-year Project. The Project's task is the development of elementary school mathematics curriculum units sensitive to local mathematical thought and experience. There were twenty-one participants (who call themselves the *Macimisers*) in the Project. The participants were educated in ethnographic and anthropological research strategies to enable them to retrieve/uncover cultural practices extant in the communities where they lived. This academics work was accomplished partially via distance learning when the participants were registered in advanced degree programs at the University of Hawai'i—Mānoa. In this paper, the Project is analyzed in terms of the concepts (*scaling across, start anywhere—follow it everywhere, intervention to friendship*, the *art of hosting* and the use of *circle)* advanced by Wheatley and Frieze.

Keywords: Indigenous mathematics; distance learning; mathematics curriculum development.

Resumen

El libro de Wheatley y Frieze: *Walk Out Walk On*, da el marco conceptual para examinar el proyecto MACIMISE, un proyecto financiado por la National Science Foundation, que se enfocó en los lenguajes y prácticas culturales de nueve islas del pacifico y el estado de Hawai'i. MACIMISE, que se pronuncia como deletreando 'maximize', es un proyecto de 5 años. El proyecto consiste en el desarrollo de unidades curriculares en matemática para la escuela elemental, sensibles a la experiencia y al pensamiento matemático local. Fueron 21 participantes (que se llaman así mismos los Macimisers) en el proyecto. Los participantes fueron educados en estrategias etnográficas y antropológicas que les permitieran extractar/destapar prácticas culturales existentes en las comunidades donde ellos viven. Este trabajo académico fue parcialmente realizado usando aprendizaje a distancia cuando los participantes se registraron en programas avanzados en la Universidad de Hawai'i-Mānoa. En este artículo, el proyecto es analizado usando los conceptos propuestos por Wheatley y Frieze (-ajustar a través de, iniciar en cualquier parte-continuar en toda parte, intervención a la amistad, el arte de hospedar y el uso del círculo).

Palabras Claves: Matemáticas indígenas; aprendizaje a distancia; desarrollo del currículo en matemáticas.

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INTRODUCTION

The twenty-one participants in Project MACIMISE[2] are from the state of Hawai'i, and nine US-affiliated islands of the Pacific {the Republic of Palau, Guam, the Commonwealth of the Northern Mariana Islands [CNMI], the Federated States of Micronesia [FSM] (which includes Yap, Chuuk, Pohnpei, and Kosrae), the Republic of the Marshall Islands [RMI], and American Samoa}. Twelve of the participants work in their local departments/ministries of education, eight work for local colleges, one works for the State's Justice department, and one is a State legislator. The latter two were with the local education authority when selected for the Project. All participants were enrolled in Doctoral (ten participants) or Masters (11 participants) programs in the Department of Curriculum Studies at the University of Hawai'i-Mānoa (UHM). They call themselves the Macimisers. MACIMISE is a National Science Foundation[3] funded project that focused on the languages and cultural practices of the islands noted above. The islands encompass at least ten distinct language groupings that are spread across 1.5 million square miles of the Pacific Ocean yet have a total landmass of less than 1000 square miles. MACIMISE is a 5-year Project that began September 2009, and was scheduled to conclude August 2014. However, the NSF granted a one-year no-cost extension so allowing the Project to complete the quasi-experimental phase of the study during a sixth year.

[2] MACIMISE stands for **M**athematics **A**nd **C**ulture **I**n Micronesia: **I**ntegrating **S**ocietal **E**xperiences.

[3] The Project is supported by a National Science Foundation grant (0918309). This material in this paper is based on work supported by that grant. The content does not necessarily reflect the views of the NSF or any other agency of the US government. The Project is a collaborative effort between Pacific Resources for Education and Learning (PREL) and the University of Hawai'i-Mānoa (UHM) with PREL as the lead organization.

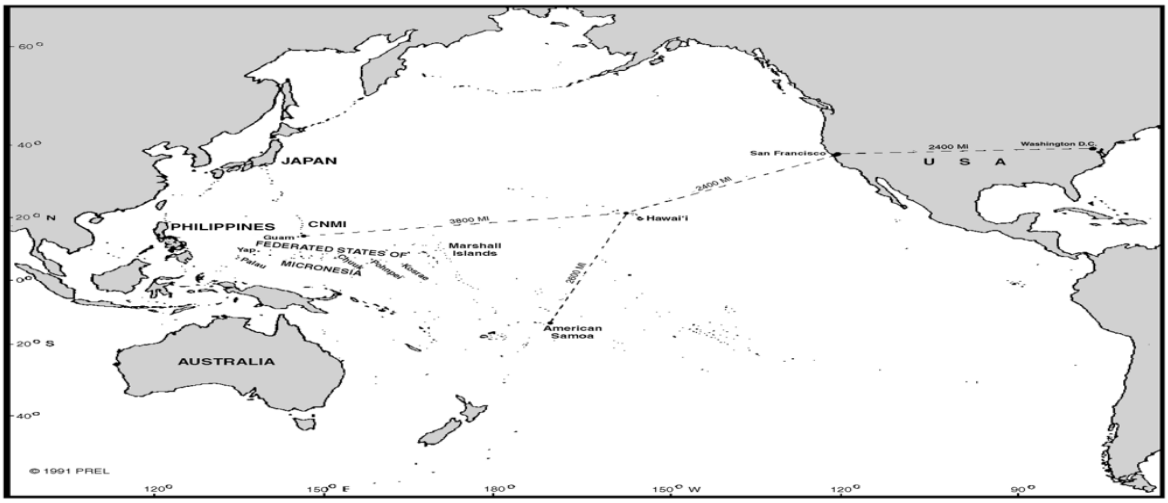

Figure 1: Map of the Pacific Region where Project MACIMISE was located

The first goal of the Project was the development of elementary school mathematics curricula sensitive to local mathematical thought and experience. A necessary prerequisite for the achievement of this first goal was to recapture and honor the mathematics developed and practiced in the various communities. This was the Project's second goal. The recapture of local mathematical thought and its transformation into school curricula requires local experts in the teaching and learning of mathematics who were familiar with the mathematical practices in their own cultures and who in the years ahead would provide leadership in the development of curricula sensitive to local mathematical thought. In order to maximize (MACIMISE) its impact the goals of the Project were to:

- develop and assess local mathematics curriculum units for grades one, four, and seven;
- rediscover/uncover the indigenous mathematics of ten Pacific island language communities; and
- build local capacity by offering advanced degree opportunities to local mathematics educators.

The dynamics of how these goals were to be achieved consisted of three phases: (1) to educate the local mathematics educators to be trained collectors of and (2) documenters of the mathematical practices found in their language and culture, and (3) to develop these

local mathematical practices into curriculum units that would be implemented and assessed in schools on the noted island communities.

At the time of writing, the 5-year Project was complete except for the quasi-experimental phase of the testing of the curriculum materials developed. Seventeen culturally based mathematics units were created. Of these, eight are to be tested using an experimental/control strategy. The testing is to be completed in the upcoming sixth school year (2014-2015). During the initial five years, participants took all the course worked required by UHM's Doctoral and Masters' programs, worked with local elders (aka persons of knowledge) to uncover/recover the mathematics extant in various indigenous practices, and consulted with local educational authorities to develop the curriculum units. The eleven Masters candidates completed their studies and graduated in May 2013. Six of the ten doctoral candidates completed their studies and graduated in May 2014. The remaining four doctoral candidates are on-track to graduate May 2015.

MAKING SENSE

In an attempt to make sense of the undertaking that the *Macimisers* embarked on, a new book by Wheatley and Frieze (2011) titled Walk Out Walk On is used here to provide a conceptual framework for the work being done by the MACIMISE participants.

Among many ideas discussed by Wheatley and Frieze that seem germane to the *Macimisers* endeavor is the concept of *scaling across*. *Scaling across* means "…releasing knowledge, practices, and resources, and allowing them to circulate freely so that others may adapt them to their local community." (Ibid. 32) This concept seems particularly appropriate to describe what is taking place in Project MACIMISE, and is offered in distinction to the idea of *scaling up* that dominates many western educational reforms. According to Wheatley and Frieze *scaling up* "…creates a monoculture that relies on replication, standardization, promotion, and compliance…. (Ibid. 35) Scaling up is the opposite of what the *Macimisers* wish to accomplish. They are interested in preserving and promoting cultural practices and knowledge that is in danger of being lost. They are not interested in designing one approach, or one interpretation, or one body of knowledge to encompass the vibrant cultures found in each of their ten jurisdictions.

> But respect for the invisible forces of place—to which we could add its social and cultural heritage—is hardly conventional wisdom when it comes to taking things to scale (ibid. 35)

The *Macimisers* would support Wheatley and Frieze's contention that *scaling up* does not fit well with the ways of working, respect for the wisdom of their elders, and the power found in their cultural practices that have enabled them to thrive on their remote Pacific islands. The 'conventional' wisdom of Micronesian cultures is not the conventional wisdom of western education systems.

This is not to imply that the practices found on one island are not similar to those found on other islands. There are some at least superficial similarities in language, in methods of building canoes and houses, forms of dance, and other indigenous activities. But there is not the standardization and replication that western educational reform movements seek. "Best practices" are not the Holy Grail for these Pacific island nation/states that they are for many western educators. As Wheatley and Frieze note:

> …exchanging best practices often doesn't work. What does work is when teams from one organization travel to another and, through that experience, see themselves more clearly, strengthen their relationships, and renew their creativity. (Ibid. 35)

In the case of Project MACIMISE, the 'organizations' that traveled are the *Macimisers* themselves. The table below provides a description of where the *Macimisers* were from, their local employers, the role they played in their communities, and the degree they were pursuing. The indigenous languages of Guam and the CNMI are Chamorro and Carolinian. Hence, there are ten indigenous languages represented by the ten island nation/states with at least two participants from each language group. (Table 1)

Nation/State	Employer	Role	Degree
Palau	Palau Community College Ministry of Education	College Math Instructor School Vice Principal	Doctorate Masters
Yap	Department of Education College of Micronesia/Yap State Legislature	Math resource teacher College Math Instructor Senator	Masters Doctorate Masters
Guam	Department of Education	Secondary math teacher	Doctorate
CNMI	Public School System	Secondary math teacher	Doctorate

Nation/State	Employer	Role	Degree
Chuuk		College Math	Doctorate
	College of Micronesia/Chuuk	Instructor	Masters
	College of Micronesia/Chuuk	College Math	Masters
	Chuuk State School System	Instructor	Masters
	Chuuk State Attorney General's Office	State Math Specialist	
		Assistant to AG	
Pohnpei		College Math	Doctorate
	College of Micronesia/Pohnpei	Instructor	Masters
	College of Micronesia/Pohnpei	College Math	Masters
	Department of Education	Instructor	
		State Math Specialist	
Kosrae	Department of Education	Elementary Principal	Doctorate
	Department of Education	Elementary Teacher	Masters
Marshall Islands	Ministry of Education	Elementary Teacher	Masters
	Ministry of Education	Elementary Teacher	Masters
	Ministry of Education	Elementary Teacher	Masters
American Samoa	University of Hawai'i/Samoa Campus	Math Teacher Educator	Doctorate
	American Samoa Community College	College Math Instructor	Doctorate
Hawai'i	University of Hawai'i	Math Teacher Educator	Doctorate

Table 1. Macimisers by organization, role and degree sought

Eleven of the *Macimisers* were involved for eight years prior to the inception of MACIMISE with previously NSF-funded projects in which PREL was the lead organization. It was the practice in those projects to bring the participants together at least once per year, rotating the meetings among the islands each year. This practice was continued with MACIMISE; the first meeting was held July 2010 on Saipan in the CNMI, and the second occurred July 2011 on Pohnpei. A third meeting took place on Palau July 2012, and a fourth, again on Saipan, July 2013. A significant aspect of each meeting was the time given over to cultural sharing thereby giving participants an opportunity to experience and learn about other cultural practices, to build strong inter-personal relationships bound together by a common interest in mathematics education, and to devote their considerable expertise and creativity to the development of teaching and learning situations based on the local children's experiences and practices.

Macimisers took the ideas they encountered during regional meetings and learnt from them. They carried these learnings back to their home islands and developed them in their own unique ways. As Wheatley and Frieze note, "…scaling across invites communities to learn

from one another and solve their own problems in their own particular way." (Ibid. 36) They would also use the term 'trans-local' to describe what happens when *Macimisers* carry an idea from one place back to let it loose in their home environment, often fostering its growth into something quite different.

WHERE TO BEGIN

Working with peoples from ten different language groups, and ten unique cultural settings spread over 1.5 million square miles of the Pacific Ocean, presents many challenges. Where to begin was certainly a question that faced the Project staff. Wheatley and Frieze (p. 91) talk about *starting anywhere, follow it everywhere* which is more-or-less what happened when the Project was launched.

Because of the *Macimisers* varied backgrounds it was decided their first university course should deal with anthropological research strategies, preferably taught by an anthropologist who knew the Pacific region, and who at least experienced some of the island cultures that were part of the Project. A professor at the University of Guam filled that requirement, and was recruited to offer the first course. This was the *start*, and the professor followed that *everywhere* by sharing with the *Macimisers* materials and experiences he had from his work on Yap and Chuuk. Based on his own experiences, he was well aware of the fact that "…each place is an interdependent web of relationships, which is why you can start anywhere…" (Ibid. 93) as Wheatley and Frieze maintain. So he started with the weaving patterns found in materials produced by the peoples on the island of Fais that is part of the state of Yap.

The course was taught via an Internet-based, synchronous interactive computer system called Elluminate[4]. Though the *Macimisers* used whatever computer they had available for this first course, during the first summer institute (July 2010) each was given a computer designed to run open source software. The decision to use these machines was based on

[4] Elluminate (recently re-branded as Blackboard Collaborate) is web-based, interactive instructional software. The software includes several visual tools, including a whiteboard, application sharing, file transfer, and web tour. The software also includes a record feature that allows the moderator to record the class for others to watch later as well as a graphing tool, breakout rooms for group work, and a timer. The whiteboard supports the uploading of presentations for viewing during the class or meeting.

equity issues with a view that the computers should not be too expensive to keep up-to-date since many of the *Macimisers* live in subsistence cultures. Wheatley and Frieze quote Desmond Tutu talking about Ubuntu, which

> "…means [peoples who are] generous, hospitable, friendly, caring, and compassionate. They share what they have. It also means my humanity is caught up, is inextricably bound up, in theirs. We belong in a bundle of life. We say, "A person is a person through other people." It is not "I think therefore I am." It says rather "I am human because I belong." I participate, I share…(ibid. p. 82)

The operating system of the computers provided to the *Macimisers* was called Ubuntu—they are called Ubuntu computers, and during the first summer institute (July 2010) the *Macimisers* bonded together and quickly displayed that 'generous, hospitable, friendly, caring and compassionate' spirit so characteristic of Pacific island peoples. As Wheatley and Frieze conclude, "This, too, is Ubuntu, an invitation to each other and every one of us to recognize that we are inextricably bound up together in a bundle of life." (Ibid. 95)

Part of each day during all summer institutes was given over to cultural sharing, a time when the group of *Macimisers* from a particular language group presented an aspect of their culture to their colleagues. This sharing may have taken the form of a chant, a song, or a dance that was taught and usually enthusiastically engaged in by fellow *Macimisers*; or the sharing may describe certain cultural ceremonies performed at, for example, weddings, funerals, or first birthday celebrations. Often gifts are presented: lava-lavas from the American Samoans, latte stones from the Chamorro group, leis from Yap, black pepper from Pohnpei, and so on. Prior to the launch of the Project, many of the *Macimisers* never had the opportunity to interact or visit with other Pacific islanders. Knowledge of each other's practices and beliefs was minimal so it was with the Ubuntu spirit that the cultural sharing aspect of regional meetings was initiated. The picture 1 below shows the assembled MACIMISE group at the summer institute on Palau, July 2012.

Picture 1. Macimisers, advisory board members, instructors and friends, Palau, July 2012

Not only were the Macimisers present, but so too was the Project's Advisory Board[5] as well as UHM course instructors and a few accompanying persons.

After ten days of intense work together, the *Macimisers* had bonded and undertook to provide support for each other academically, physically, and spiritually. All *Macimisers* were given unlimited Internet access. Perhaps not surprising was the fact that Facebook became a daily venue for the sharing of successes, challenges, frustrations experienced by group members.

During the fall and spring terms of UHM, all Macimisers were enrolled in graduate courses that met once per week through the Internet medium of Blackboard Collaborate. This was a challenge logistically, since the Macimisers resided in six different time zones spread across the Pacific Ocean west of Hawai'i. Moreover, four of those time zones were on the opposite side on the International Date Line. To accommodate all the time differences a

[5] The Project's Advisory Board is composed of eight members, seven of whom were present in Palau: Beatriz D'Ambrosio, Bill Barton, Betsy Brenner, Shandy Hauk, Jerry Lipka, Arthur Powell, and Katherine Ratliffe. Ubi D'Ambrosio was unable to make the long trip to Palau.

timetable was developed that allowed the class sessions to be synchronous; i.e., all Macimisers connected simultaneously, but at different times and days across the Pacific. An example of such a timetable is given below (Table 2).

Countries	Hawai'i	American Samoa	Marshall Islands	Kosrae Pohnpei	Chuuk Guam CMNI Yap	Palau
Day	Wednesday	Wednesday	Thursday	Thursday	Thursday	Thursday
Time	10:00 PM	9:00 PM	8:00 PM	7:00 PM	6:00 PM	5:00 PM

Table 2. Timetable arranged so that all Macimisers and instructors were in simultaneous communication

The course instructor would originate the meeting at the day and time of the instructor's location (e.g., 6:00 pm Thursday if living on Guam), and the Macimisers would connect to Blackboard Collaborate at the day and time for their home island (e.g., someone on Hawai'i would connect at 10:00 pm, Wednesday, the day before, calendar-wise). Though it may sound confusing, after the first few meetings of the very first class in January 2010 the schedule worked smoothly. It did mean, of course, that for Macimisers on Hawai'i, the two and half hour meeting took place from 10:00 pm Wednesday to 12:30 am Thursday! Since all the Macimisers were fully employed and could only 'attend' class after their working day was over, the earliest a class could begin was 5:00 PM Palau time. All the Macimisers adjusted to this in order to accommodate their MACIMISE colleagues. This too was the Ubuntu spirit expressing itself in the workings of the Project. So the Project started *somewhere*, and in the intervening five years the *Macimisers* lead it *everywhere*.

FROM INTERVENTION TO FRIENDSHIP

The history of Micronesia is replete with examples of programs and projects being introduced by outside people who claim to be able to contribute to providing a solution for whatever challenge brought them to the islands. No longer do Pacific islanders necessarily welcome such intrusions. When visiting the islands for the first time many years ago, one educational leader said to me, "So you have a new program, and three years from now you will pack up and head back to the States, and what will be left to show from your program?" He was clearly skeptical, no doubt based on previous experiences, of the long-

term benefits of the program being proposed. Such interventions are short-term strategies for current challenges, but it is clear that Pacific islanders realize that any longer-term impact requires the active engagement over time of significant people. Wheatley and Frieze posit the following relationship between the short-term interventionist programs, and the philosophical underpinnings of the outside educator's vision.

> This empty-vessel paradigm of learning is one of the foundations of [the] interventionist mind-set. It posits that the trainer is full, the trainee is empty, and it is only a matter…of pouring knowledge from one into the other. (Ibid. 172)

They go on to argue that

> The empty-vessel paradigm of learning is fundamentally founded on the inequality between the professional and the amateur, the expert and the ignoramus, the so-called developed and underdeveloped. (Ibid. 177)

The genesis of the MACIMISE Project came from the Pacific islanders themselves, and arose because of the intimate connections that Project staff had developed with the islanders over the previous ten years of working across the Pacific region. Back in 2000, one of the current *Macimisers* became part of a previous NSF-funded project (DELTA[6]) almost by accident. He happened to be standing in the College of Micronesia: Yap campus offices one day when I was there seeking a college math person to be part of the year old DELTA Project. Eight years later he had taken part in both the DELTA Project and Project MENTOR[7]. Over a meal on Yap when I was making one final trip across the region as Project MENTOR was wrapping up, his response to a question about 'what should we do next if money could be found,' elicited this thoughtful and heartfelt reply.

> For eight years we've studied western mathematics, mainland mathematics, and teaching approaches that are suited to mainland children. Why don't we ever look at Yapese cultural practices and languages, examine them for the embedded mathematical knowledge, and then create lessons and units of work for our children that are based on things they've experienced? Not many Micronesian children have ever experienced snow, but they sure know about fishing in lagoons. (J. Fagolimul, personal communication.)

His response was the germ of the idea that eventually blossomed into Project MACIMISE.

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[6] Developing Effective Leadership Team Activities, NSF grant (9819630) 1999-2002.

[7] Mathematics Education for Novice Teachers: Opportunities for Reflection, NSF grant (0138916), 2002-2008.

In hindsight, it is clear that Project DELTA was interventionist. It met and fulfilled a short-term need that was to assist Pacific islanders in developing their capabilities to provide in-service education to their local teachers. Project MENTOR worked with these newly empowered in-service providers as they moved into the schools to teacher colleagues who were new to the teaching of mathematics. The suggestion noted above offered by the Yapese *mentor* arose because of the relationship that had developed between that one *mentor* and me. "Perfect friendship is a relationship between equals who offer good will to one another." (Ibid. 182) Because such a relationship existed between the *mentor* and myself, he felt comfortable in pointing out the weakness with Project DELTA and MENTOR, and in offering an alternate goal for the fledgling Project MACIMISE.

The Yapese *mentor's* response to my query was the conversation opener for the remainder of that 2008 trip across the region. On each of the islands visited (Palau, CNMI, Guam, the FSM, and the RMI), the reaction was the same: yes, why don't we look at our own cultural practices, our own languages (some of the islands use as many as four or five different dialects)? They said that not only would their children relate more easily to examples and illustrations from things they know, but also such an approach would help to preserve some aspects of their cultures and languages that are being lost. One gentleman on Chuuk lamented the fact that at one time there were more than 50 ways of counting, and now there were only 3 and even those were in danger of being lost. Conversations with community elders (persons of knowledge who may or may not be old in terms of age), reinforced the desire that traditional practices not be lost, that the younger generations needed to be introduced to and educated in the ways of living on isolated Pacific islands which enable survival, protect the land and waters surrounding their islands, and keep the people locally smart as well as world smart. MACIMISE is not an interventionist project. It is a project conceived of by Pacific islanders to serve the perceived needs of Pacific islanders. It supports Pacific islanders to engage in examination of their own practices, to recover any indigenous knowledge on the verge of being lost, and to re-frame the mathematical attributes of that knowledge into local developed classroom experiences and investigations.

Project MACIMISE is an exemplar of "…what becomes possible [when] we work together on what we care most about, freed from overbearing control, curious about one another's

talents and knowledge, discovering the wisdom and wealth revealed when we turn to one another." (Ibid. 219) The *Macimisers* were fully engaged in bringing to life the possibility of locally developed curriculum units for mathematics that are based on local cultural practices.

FROM HERO TO HOST: CIRCLING AND THE ART OF HOSTING

The transition from Project DELTA being an interventionist endeavor to Project MACIMISE being a collaborative, Pacific Islander led enterprise though gradual was envisioned from the outset of Project DELTA. An approach initiated at the first meeting of the Project DELTA participants in January 2000 was that of *wisdom circle* and the use of a *talking stick*. Christine Baldwin (1998) has written extensively about circle and its origins with indigenous cultures. She says,

> A circle is not just a meeting with the chairs rearranged…. A circle is a way of doing things differently than we have become accustomed to. It is a return to our original form of community. In circle, we rediscover an ancient process of consultation and communion that, for tens of thousands of years, has held the human community together and shaped its course. (Baldwin, 26)

It was with a good deal of trepidation that circling was introduced at the first meeting of the DELTA participants. At the conclusion of DELTA's three-week workshop, acknowledging first that I was leery of using the circle approach, participants were asked their reactions to the use of circle. One man from American Samoa spoke up, a big smile on his face, saying,

> In my village at home, we use circle as our way of working when we have community meetings. We sit in circle, and each person in turn around the circle is given the opportunity to express his or her views of whatever we are discussing. Circle was not new to me. It is actually quite old and has been used for a long time in my village. (T. Fale, personal communication)

And so began the circling process used throughout Projects DELTA, MENTOR and MACIMISE. During the MACIMISE summer institutes, each day concluded with circle where *Macimisers* would 'talk story' about the events of the day, or respond to some questions brought forward from the participants.

Circling facilitates the transference of responsibility from a leader to the participants. Leaders are supposed to have the answers. Wheatley and Frieze (207) state, "When we believe this, we willingly give away our power. We wait for leaders to direct us, assuming

they know what they are doing." But in circle, as the talking piece travels around, every voice is heard, "…even those that for reasons of age or gender or politics have been silenced…" (Ibid. 103) The talking stick is a powerful tool. Initially, a sacred eagle feather (presented to the author by an indigenous band in northern Canada) was used but it deteriorated over time and was replaced by a hand-carved Haida Gwaii talking stick. The use of the stick changes the conversation, changes the participant's focus, and though resisted initially by some who are not used to its use, has a powerful impact on the group.

> But when people get engaged in the conversation, the process sells itself. It's easy to do. What I like about the talking piece is it slows the conversation down. You put the rules on the wall—speak with intention, listen with intention—it changes the dynamic. All of a sudden, you put the Blackberry down and pay attention. You don't talk over people. You learn to deeply respect other points of view. (Ibid. 193)

Wheatley and Frieze compare the art of hosting to the computer code—Linux—that is the basis of open-source software. "Like Linux, " they state, "the Art of Hosting operating system encourages experimentation and sharing worldwide." (Ibid. 199) Working within circle engenders an environment of 'hosting' rather than one led by 'heroes'. There is a code surrounding the use of the circle, just like the code that Wheatley and Frieze claim surrounds the Art of Hosting.

> Its codes is a set of principles and practices of how to host conversations that matter: setting intention, creating hospitable space, asking powerful questions, surfacing collective intelligence, trusting emergence, finding mates, harvesting learning, and moving into wise action. (p. 199)

The project presents the *Macimisers* with multiple opportunities: opportunities to interact with other Pacific islanders, opportunities to interact with international experts from the field of ethno-mathematics (e.g., Ubi D'Ambrosio and other members of the Project's Advisory Board), opportunities to share with colleagues on their home islands, and opportunities to learn from a broad range of people in a variety of environments including but not limited to community elders. Furthermore, as one *Macimiser* said, "there is a giving of respect to those who went before—elders, researchers, and scholars—and gaining respect for and confidence in the work we are doing." The vision of the Project to 'maximize' the potential of Pacific islanders to become educational leaders on their home

islands, and to further the growth and understanding of indigenous based mathematics curriculum as found in the cultural practices of their island nations has been realized.

As this paper is prepared, Project MACIMISE is well into the sixth year of its extended five-year journey. The *scaling across* the ten island language groups is well underway, the *Macimisers* are identifying *start*ing points and are following them *everywhere*, they have forged *friendships* that grow in depth and richness with each interchange that occurs, whether face-to-face or via the Internet, and when they come to sit together in a hospitable space for the first circle when next they meet, they will ask each other powerful questions, allow their collective intelligence to emerge, harvest the learning that occurs, and move forward to wise action.[8]

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[8] The author and three of the MACIMISE doctoral students (Bea Camacho, Tauvela Fale, and Dora Miura) during a Round Table discussion at the 2012 Annual meeting of the American Education Research Association (AERA) held in Vancouver, Canada presented an earlier version of this paper.