T^4 and Culture: Pedagogy of Transformation

Anna Y. Sumida and Meleanna A. Meyer

Teaching to the Fourth Power is an educational framework focused on exponentially drawing out students' unique human potential. This multidimensional paradigm involves pedagogical processes of T^{1}ransmission, T^{2}ransaction, T^{3}ransmediation, and T^{4}ransformation. These intertwined processes work as an ecosystem, utilizing the learner's home culture, host/indigenous culture, local culture, and global culture. Our concerns are to integrate culturally endemic, relevant processes grown from within. Therefore, it is a vision of education that moves toward engaging students in active application of relevant, hands-on experiences, connecting them to their cultural roots to affirm their identity, native language, and appreciation for the *'āina* (land) from which they come. It is a vision where teachers, students, and families become producers of knowledge and agents of social change.

CORRESPONDENCE MAY BE SENT TO:
Anna Y. Sumida, Instruction & Curriculum Support, Kamehameha Schools
225 Bishop Circle, Honolulu, Hawai'i 96817
Email: ansumida@ksbe.edu

Meleanna A. Meyer
Email: aloha.meleanna@hawaiiantel.net

The educational system is constantly faced with calls for greater accountability and insistence on standards, "fail-proof" scripted curricula, and well-trained, highly qualified teachers. Many of these concepts are necessary; however, most of them have been in existence in various shapes and forms since the 1950s but have not resulted in large-scale improvements for native people, minorities, or students from low socioeconomic classes in the United States. Blaming an educational system striving to improve is a red herring. It distorts reality and distracts the public's attention from revealing a complex web of overarching issues and root causes that do not get revealed, discussed, or ameliorated. Benham and Heck (1998) wrote,

> We believe that the longest war in history has been the war against indigenous peoples. Modern industrial countries have dominated, enslaved, and colonized, thereby defining the native role and place at the bottom of the socioeconomic hierarchy. In these primarily capitalistic economies, value is placed on property and economic gain, and the health of a society is measured by its gross national product, gross domestic product, and income level. (p. 3)

The rhetoric of "solving" social problems by restructuring schools and promoting educational reform blinds the public from the macro levels of economic, social, and political structures that create the basic oppression, malfunction, and inequality within a society. There is an urgent need to recognize how Hawai'i's public education is situated within the legacy of colonialism and a plantation mentality that continues to wrest control over our children's futures.

Reading the work and learning from the intellectual inquiry of scholars in the area of culture (Benham & Cooper, 2000; Kaomea, 2003), critical theory (Freire, 1970; Giroux, 1988), and critical literacy (Luke, 1988; McLaughlin & DeVoogd, 2004), we share evolving theoretical underpinnings that very much challenge the status quo. Undergirding this inquiry is the valued belief that if we awaken our intellectual growth as teachers, we in turn will do the same for our students, and for the larger educational community of learners. Freire (1970) stated that genuine learning occurs when students are actively involved through praxis in controlling their own education.

In the Hawaiian language, the word *a'o* is used for both "teaching" and "learning." Fundamentally, it is a continuous reciprocity of learning whereby one tries something new, gets feedback, and learns from the experience. Harste (2001) described this interdependent relationship as "education as inquiry and inquiry as education."

In 2003, this interface of intellectual inquiry was exercised by staff members of Kamehameha Schools, Extension Education–Literacy Enhancement Department in Honolulu, Hawai'i. Consisting of 10 teachers, a cultural arts specialist, and 10 educational assistants, we worked in partnership with the Hawai'i State Department of Education in Native Hawaiian charter schools and six high-poverty, low-performing public schools with concentrations of 50% or more Native Hawaiian students. Providing professional development, instructional materials, tutoring support, and parent education workshops, our goal was to find culturally relevant pedagogical methods that intrinsically motivated lifelong learning and literacy achievement among K–12 learners and their families.

FIGURE 1 A young student in the third grade deeply engrossed in his work.

MELEANNA A. MEYER

345

Our intention was to develop on and expand the notion of a'o as the pursuit of inspiring insight and creating relevant knowledge. We envisioned education moving toward lively work that engaged students in applying knowledge and hands-on experiences that actively connected students to their cultural roots in order to affirm their identity, native language, and sense of place, or the *'āina* (land), from which they come. It is a vision of academic success where teachers, students, and families become agents of social change—for the good of the whole, not only for one dominant group in power.

One Voice Speaking for All

In the past, educational practice has focused primarily on a transmission "fill the empty vessel" model of education dealing with dominant, mainstream, Western ideology. Because this model often alienated student learners due to the absence of cultural relevance, what we explored were ways to offer a more viable, educational model that built on the cultural strengths of our students.

We found that Bourdieu's (2001) theories of social and cultural reproduction framed the institution of schools as mechanisms that control access to cultural and social capital. As a result, schools have committed a kind of "symbolic violence" by disallowing marginalized discourses. Narrow scripted programs and testing mandated through the federal No Child Left Behind policy have further restricted minority voices and privileged dominant discourses through prescribed reading instruction and materials. Literacy research by Purcell-Gates (2007) also corroborates that dominant discourses perpetuate and reproduce "a frustratingly closed discourse/power loop" (p. 6). These findings were critical to our ongoing discussions as we attempted to build a new kind of critical discourse among our colleagues.

What the brilliant educational theorist Paolo Freire (1998) clarified in this conversation was what he called an "ideological fog that obfuscates reality" and "undeniably serves the interests of the dominant class. The dominant ideology veils reality; it makes us myopic and prevents us from seeing reality clearly. The power of the dominant ideology is always domesticating" (p. 6) and maintains a hegemonic silence upon the oppressed.

Mired in an ideological fog that marginalizes Hawaiian worldviews, how do we unwrap and lift our minds from it? Social change occurs when a group of people has a metacognitive awareness of the problem. Collectively, once the group recognizes the oppression, they no longer have to participate in it and can envision new possibilities. This is where we collaborated to conceptualize a theoretical paradigm, Teaching to the Fourth Power (T⁴): T¹ransmission, T²ransaction, T³ransmediation, and T⁴ransformation. What exactly is it? It is a perspective that clarifies various educational processes to better assist educators in understanding the synergistic nature of teaching and learning. These four dynamic, pedagogical processes have the capacity to exponentially build upon one another—transforming education as many know it by allowing for an authentic learning experience, a life-changing experience.

Teachers as Intellectuals Versus Teachers as Technicians

Giroux (1988) described the political climate as one in which reform movements ignore the role of teachers as intellectuals. Instead, teachers are reduced to high-level technicians of scripted reading programs, crowding out their role in preparing students to be active and critical citizens. As director of the department, Anna Sumida was enrolled in a doctoral program at the University of Hawai'i in the area of curriculum studies focused on culture, critical theory, and critical literacy. As a staff member, this led her to an ethnographic self-study, through readings, discussions, observations, and written reflections to metacognitively examine our beliefs, values, practices, behaviors, and language in an effort to demystify Freire's notion of "ideological fog."

As educators working in the contexts of scripted reading programs, we exercised intellectual inquiry at our weekly meetings as a process to self-critique and question our own thinking about teaching and learning. If we promoted a curriculum that students did not feel engaged and successful with, were we not complicit in a kind of social injustice that disenfranchised learners whom we wished to serve? If we were not empowered to think more critically and envision a critical educational democracy, how could we support students in empowering themselves to liberate their own thinking to become more thoughtful, active citizens in their global and economic futures? What role should literacy serve in this ongoing debate? What is education for and whom should it benefit?

We felt that a dominant, mainstream school curriculum was an incomplete and biased model because it provided only one view of the world. Privileging Western, White, middle-class values and beliefs in these predominantly Hawaiian communities alienated many students because of the absence of culturally relevant materials, contributing to disengagement with schooling, comprehension/vocabulary gaps, and high dropout rates. Current Department of Education curricula often fail to honor students who come to school socialized and prepared with a different, yet equally important set of cultural values and beliefs. In this light, the insights we share about Native Hawaiians have broad application to any group of learners, such as Native Americans, Mexican Americans, African Americans, Asian Americans, alienated youths, learners in low economic social classes, and other global communities in which Western, mainstream ideology inundates and controls much of the educational discourse.

Rather than serving Hawaiian students from a deficit paradigm, our professional inquiry focused on uncovering the root causes of underachievement and productive ways to rectify it. Unless these causes are critically identified, analyzed, unpacked, and deconstructed, we have found that systemic, educational reform and success cannot realistically occur.

The Erasure of Culture in Education

Because Native Hawaiians have been historically marginalized and educationally disenfranchised through the process of colonization in the islands, we then intended to delve more deeply into the root causes of continuing underachievement in the Hawaiian community, knowing that the constellation of issues is much broader and more debilitating than has been acknowledged. Benham and Heck (1998) explained that in the 1840s Hawaiians were among the most literate people in the world. Hawai'i had the highest literacy rate west of the Rockies (Kamehameha Schools, 1991). Hawaiian was the official language used in government, schools, and the home. Nearly 100 newspapers were printed in Hawaiian. However, in 1893, the Hawaiian government was overthrown by Western colonizers. Additionally, in 1896, language and culture were stripped away when the use of Hawaiian as the medium of instruction was forbidden in public schools.

Cumulatively, the destruction and erasure of Hawaiian governance, social relations, and language have had devastating effects. Some of these detrimental effects included lack of self-esteem and cultural esteem, ethnic stereotyping, breakdowns in the family unit, alcohol and substance abuse, increased criminal acts, high rates of suicide, child and spouse abuse, overrepresentation in special education, over-representation in low-status service occupations, lower life expectancies, high teen pregnancy rates, and higher rates of diabetes, heart disease, hypertension, and cancer (Benham & Heck, 1998).

Poets have expressed this demise as *"Pua i 'ako 'ia,"* meaning "a flower has been plucked" (Benham & Heck, 1998, p. 1), and *"Malihini no nā keiki o ka lākou 'āina pono'ī iho,"* meaning "the children of the land are strangers in their own land" (Benham & Heck, 1998, p. 122). Our remedy and response to this ongoing tragedy was to create a means to assist and support educators in the Hawaiian community to creatively find additional venues and platforms, working more productively with our youngsters and their parents to build them up, to empower them to have a voice, to support their growth in community and beyond.

T⁴ = Teaching to the Fourth Power

We named four broad categories of teaching and learning to view the landscape of education from a macro lens of praxis. When multiplied together, the net effects become: Transmission x Transaction x Transmediation x Transformation, or T⁴. Teaching to the Fourth Power, as symbolized by T⁴, works as an interdependent system with an additional cultural context. Although each process and their examples will be characterized and defined separately, we make clear an important caveat—we feel that these processes are not linear and should not be viewed as nonintersecting planes. The mathematical representation is intended. Each process exponentially increases when each part is factored together with the others. Cumulatively, they are deeply interdependent and layered as integrated processes within shared space and time. Each layer is nested and *inclusive* of each other, exponentially increasing the potential of teaching and learning when they interdependently coexist as a system. To capture the complex and important dynamic of this synergistic model, we utilize a valuable metaphor embedded within Hawaiian culture to explain the particular nuances found within T⁴.

A Culturally Relevant Example: Stirring the Waters of *Kai* and *Wai*

Along Hawai'i's coastal shoreline are protected ecosystems called *loko i'a*, or fishponds (see Figure 2), where the freshwater (*wai*) system from the mountains flow into the saltwater (*kai*) system of the sea. The stirring of these waters create a delicate balance of 97 elements—identical to the life-giving blood within our human bodies (Machado, 1999). These waters of the loko i'a harvest a rich and diverse abundance of marine life, such as shrimp, crabs, fish, seaweeds, and plants to sustain a part of the local food supply for islanders.

FIGURE 2 Freshwater and saltwater blend together

1990, BRUCE LUM, KAMEHAMEHA SCHOOLS

Using the seamless ecosystem of a healthy loko i'a as a cultural metaphor, we liken the T⁴ processes as necessary elements for a healthy environment of learning and working within cultural contexts. Like all ecological systems, relationships are interdependent, contingent, and not strictly hierarchical. Most important, all elements of pedagogy and culture are valuable and critical to produce healthy and thriving environments. Similarly, as in educational contexts, teaching and learning communities are complex ecosystems and environments with multiple entry/exit points. They have the dynamic ability to change and respond in relation to the context and to the learner's needs or educational situation.

TABLE 1 Exponential power of teaching and learning as an ecological system

T x T x T x T	T¹ransmission →	T²ransaction ↔	T³ransmediation ↔	T⁴ransformation ↗
Learner characteristics	*Consumers of knowledge*	*Users of knowledge*	*Interpreters of knowledge*	*Producers of knowledge*
Teaching and learning processes (As a dynamic and interdependent system, TxTxTxT exponentially increases the power of teaching and learning.)	• Tools in a teacher's "tool kit" of best practices • Instructional kits • Training videos • Basals, textbooks, teacher guides • Workshops, lectures, books, journal articles • Content area facts and information	• Collaborative social contexts • Involves interactive dialogue • Application • Inquiry • Goal setting • Reflection and self-evaluation • Builds capacity and lifelong learning	• Interdisciplinary (bridging and connecting content areas and domains) • Multiple intelligences • Multiliteracies • Multiple ways of knowing • Different learning styles	• Agents of social change • Real-life applications beyond the walls of the classroom • Culturally relevant • Involves critique (critical literacy, Freire's "reading the world") • Liberate thinking • Service and stewardship oriented • Spiritual
Teaching and learning style	• Teacher as expert • Direct Instruction • Behaviorist • Skill and drill • Rote memorization	• Teacher as facilitator • Process oriented • Constructivist • Structured or guided inquiry • Cognitive engagement with others • Social interaction	• Interpretive • Use of metaphors • Creative • New perspectives • Negotiate meaning-making • Uses intuition • Instinctive • Emotional sense of spirituality	• Teacher as co-learner • Critique to analyze relations of power • Dialogic (enables voices to be heard) • Allows access to change
Teaching and learning context	• Classroom-based • Usually homogeneous (age, ability grouping, etc.)	• Classroom-based/home connections • Heterogeneous • Multiage	• Personal ownership of meaning-making with seamless boundaries between home and school	• Makes an impact or contribution to the social conditions of the world. • Real world (home, host, local, global cultures) • Funds of knowledge • Cross-age; inter-generational
Assessment and evaluation	Quantitative • Timed tests • Chapter tests • Multiple-choice tests • Mastery learning • Letter grades or numerical scores • Norm-reference tests (SATs)	Qualitative • Open-ended responses • Student-generated rubrics and criteria • Observation; anecdotal records • Narrative reports • Learning logs • Portfolios, self-evaluation • Criterion reference tests	Qualitative • Based on student strengths and potential • Performance based	Qualitative • Social impact and public contribution to society • New knowledge • Invention and innovation • Creative change

For the sake of readability, Table 1 graphically illustrates the T⁴ processes in a linear format, and each is explained in further detail. Although the table is depicted as a matrix, it is important to reiterate that the four processes are not linear in design. They are interdependent and inclusive, like the stirring of waters in Hawai'i's loko i'a ecosystems.

T¹ (Teaching to the First Power) = Transmission (Learners Consuming Knowledge)

The Transmission process focuses on building a teacher's professional toolkit. Teachers usually acquire instruction on the "what" and "how" of essential practices, through education courses at universities or staff development in-service workshops. These workshops include various degrees of transmission or direct instruction about teaching methods and strategies such as reading aloud, phonics, language experience, craft lessons in writing, conventions, skills, spelling, shared and guided reading, comprehension strategies, literature circles, reader response, training on computer software, and the list goes on. Usually taught by a highly experienced instructor, multiple techniques are used and include lectures, videos, training manuals, handouts, articles, textbooks, and software. The larger the repertoire of a teacher's toolkit, the better. In this context, competing debates of whole language versus phonics become irrelevant because both sides of the debate are necessary. On the basis of experience and practice with various tools, the teacher as an intellectual skillfully differentiates and appropriates instruction to meet the needs of a range of learners.

Within a classroom context, a brief snapshot of transmission as a pedagogical process would look like drill and skill on blends and digraphs using practice worksheets. Other examples would include direct instruction on spelling, conventions of grammar, paragraphs, and instructing students on the usage of dictionaries, glossaries, table of contents, and indexes.

These are important "tools" for students to acquire; however, tools in a toolkit are necessary but not sufficient. Without a practical, working knowledge of how to *use* these tools, authentic, productive, and sustaining work cannot go on. Transmission, representing the "what" of teaching, sets the stage for the second eddy of this educational pooling—the process of Transaction.

T² (Teaching to the Second Power) = Transaction (Learners Using Knowledge)

Transaction is the application of knowledge within a social context of learning based on social constructivist theories of language and literacy (Scribner & Cole, 1981; Vygotsky, 1978; Wells, 1986). The Transactional process fosters a fluid, *collective* relationship with others as well as a *self*-reflective relationship with oneself. We actually borrow the term *transaction* from Rosenblatt's (1978/1994) transactional theory, which states that any reading event is a back-and-forth transaction between a reader and text to make meaning. Dewey and Bentley (1949) also believed that learning is a transactional process or mutual interplay of reciprocity and relationship to others, whether it be in the classroom, family, or broader society. In constructing knowledge, social engagement, dialogue, and communities of practice (Lave & Wenger, 1991) are at the heart of the process and are the portal to a culture of learning.

Historically, educational models focused on Transmission, positioning learning as an individual process with the goal of mastering facts, information, and skills. Learners are placed in comparative or competitive environments with ability tracking determined by test scores and where learners are viewed as empty vessels to be filled.

Learning is enhanced when *applying* and *using* information and factual knowledge. Therefore, Transaction is inclusive of and animates the "what" of Transmission. Examples include literature circles where students discuss various perspectives and may even have differing opinions about a character or solution in a story. It is about access and is dialogic, where making sense of disparate points of view allows voice to emerge. It fosters educationally democratic principles that engender and support diverse worldviews.

Examples of transactional learning experiences include writing conferences. In one classroom, where writing workshops are held each day, Anna Sumida observed Kristi, a first grader, share a one-sentence story she had written about her new puppy with another peer in her class named Joshua. Kristi had written, "I love my dog and his chest is pure white."

Immediately after the sharing, Joshua curiously asked, "What's your dog's name and does he do tricks?" This interaction between writer and audience enabled Kristi to revise and write a more detailed and interesting piece with her audience in mind. Later that morning, she added, "His name is Kea because Kea means white in Hawaiian. He plays with me and my sister and sometimes I hold out a biscuit and make him bark three times and roll over. We think he is very smart." Her writing and illustration were eventually published and displayed in the classroom library. This interactive process of peer conferencing enhances writing quality and encapsulates the dual relationship of T^{1}ransmission nested within T^{2}ransaction, because Kristi *used* her emerging skills and concepts of print to write a more descriptive story that was shared with her classmates.

Transactional learning is wide ranging and could include group projects to write a class play, an anthology of family stories, letter writing or e-mailing pen pals in another state or country, and interviewing elders for a community oral history project. Inherently, transactional learning within a social context frequently includes hands-on experiences, engagement with problem-based inquiry, goal setting, dialogue journals, reflections, and peer debriefing/feedback loops for evaluation. In this way, learners have access to learning communities and networks established through an experience-based, reflective process that opens pathways for creative and collaborative innovation. Transaction expands teaching and learning into contexts ranging from *individual* to *communal* processes of expression, which is much more culturally congruent in many non-Western educational models.

T^3 (Teaching to the Third Power) = Transmediation (Learners Interpreting Knowledge)

We define Transmediation as an interpretive process whereby knowledge is reconstructed by learners in order to take *personal ownership* of their learning based on their potentials, strengths, multiple intelligences (Gardner, 2000), and creativity. *It is the pivotal turning point when teachers must trust the learner to take responsibility for their own learning.* Expressed through a variety of forms, Transmediation opens interpretive spaces that bridge and connect knowledge as a meaning-making process to personal experiences.

Leland and Harste (1994) wrote about their definition of transmediation:

> The movement between and among sign systems is known as transmediation. Transmediation occurs when meanings formed in one communication system are recast in the context and expression planes of a new sign system (for example, we take something we know verbally and recast it in art). We see transmediation as a fundamental process in literacy. Movement between and among sign systems provides the opportunity for new perspectives on our knowing and, hence, for the expression of an expanded range of meanings. Transmediation encourages reflection and supports learners in making new connections. (p. 340)

The medium of transmediation is poorly understood in linear circles, yet for all creative nonlinear art types, this right hemisphere is the open arena for working out all substantive things—philosophical, emotional, life threatening, or altering. This rich arena of transmediation is the most important ground for making sense of larger issues, working out of lingering questions, and testing newfound insights.

Meleanna Meyer also incorporates in her work with the children an additional point of view that allows for a sixth sense, the *na'au*, or intuition/emotion. This gives us the permission to go beyond the limitations of one cultural canon. The potential, then, is to not only reunite the Cartesian mind-body split but also demonstrate that the foundation of an educationally democratic point of view has the freedom to include animated spirituality. In this way, knowledge is not always objective, tangible, or easy to measure. In many ways, it is more powerful than numbers or words can tell because it liberates creative imagination, fosters a passionate voice, and nurtures soulful contemplation. We feel that transmediating knowledge comes from a different place, has a language of its own, and isn't always located exclusively in the mind. It is full-bodied and includes the na'au, or intestinal "gut" feelings. It is multifaceted, but for the purpose of this article, only a few examples are highlighted.

For example, as part of an open house at the beginning of the year, students painted self-portraits and wrote about themselves and what their Hawaiian names meant to them. Iaone, an 11th grader, wrote a piece (see Figure 3) that was mundane, but

when interviewed about his painting, he realized that the art form (see Figure 4) took him beyond the assignment in terms of his cultural sense of identity.

FIGURE 3 Ioane's writing

Ioane Kahuapono Goodhue

My name is Ioane Kahuapono Goodhue. Ioane was given to me by my mother because she liked the name. My middle name, Kahuapono, means the strong and righteous foundation. My grandmother gave me this name. And finally my last name. Goodhue, the name I got from my father.

FIGURE 4 Ioane's self-portrait

Here are excerpts from his interview:

> I started with the hair—two different styles. Up and then
> down. I was having a conversation with myself and this
> drawing reads all sorts of ways. This piece touches lots
> of things and shows different aspects of me. I wanted to
> show the different sides of me. In a traditional sense, on
> the right expresses more the internal feelings I have now.
> How I'm unhappy with the way much of society is, how it
> ruins us, and this is the state of being for lots of Hawaiians.
> I'm weeping, I was going to put tears. The background is
> empty, kind of buried or gone. And then on the left a more
> full side—the background, representing 3 *piko*, or centers
> of past, present, and future [note the three rainbow arches
> in drawing]. The environment and family things are at the
> center of me, both right and left represent the full sides
> of me.

When Meleanna asked how he got to this consciousness of himself, he replied, "You and me, we got there together, you were willing to trust me to take it and go—I was willing to go there." The sign system of "arting" encouraged reflection and interpretation, and it transmediated the essence of the writing assignment to communicate and convey Iaone's feelings, thus expanding his sense of identity beyond words.

This notion of interpretation is crucial to settle because this stage of learning is the most potent, the most messy, the most mysterious, chaotic, and open to diverse avenues that bring the learner to an "aha" moment of understanding and comprehension. For creativity to work, risk taking and innovation are part of the equation, and here is where the mind, heart, and intuition all converge.

Interdisciplinary learning is another facet of the Transmediation process. For example, fourth-grade students produced a play on endangered Native Hawaiian birds for an integrated science and social studies unit. Students researched information and transmediated the information into a story utilizing *mele* (song), *hula* (dance), and *hula kiʻi* (puppetry). In this way, learning is not fragmented into discrete disciplines in the Aristotelian sense. The power of teaching

is exponentially enlarged because T[1]ransmission and T[2]ransaction are nested within T[3]ransmediation. Assisting our young to make connections, creating open opportunities for pleasure and passion, allows for a real exchange of communication to take place beyond words and numbers, among divergent groups, across difference.

Anna's nephew, a kindergartner at a local elementary school, learned to read iconic visuals and initial consonant sounds through his interest and fascination with a chart of 50 Pokemon characters' names and their defensive/offensive combat techniques. His deep interest enabled him to navigate and decode this highly sophisticated genre of literacy that is not accepted as a sanctioned literacy of schools (in fact, in many schools, it is censured). Cope and Kalantzis (2000, p. 6) explained this as "crossing linguistic boundaries" through an "ever broadening range of specialist registers and situational variations, be they technical, sporting, or related to groupings of interest and affiliation" as a form of meaning-making and form of literacy.

It is important that educators expand on their own homegrown notions of literacy to build bridges that better connect to specialized literacies, or multiliteracies, that are relevant to today's learner. These should accompany school-sanctioned literacies so that learners feel engaged in meaningful ways that have application to their lives.

Because there is no efficient, standardized, one quick fix or way to arrive at a "right" or single answer, holding space in T[3] is often the best thing that anyone can do—until an answer is found, discovered, created, or conjured. Because there are often multiple answers to complex problems, or a constellation of ideas that are required to bring the explorer to a new level of understanding, patience and courage are also requisite. It is about the richness of human diversity and education that is at once elevating and humane.

Transmission, Transaction, and Transmediation integrate and interact with fluidity and become the potent mixture and ground for students to transform their worlds in substantive ways that are potentially life changing. However, the process does not stop at Transmediation. T[4] invites and engages learners into a more relevant educational experience that supports moving toward a Transformative process where learners empower themselves to create new knowledge and become agents of social change.

T⁴ (Teaching to the Fourth Power) = Transformative (Learners Producing Knowledge)

Transformative pedagogy has the broadest application to the real world and is inclusive of T¹ransmission, T²ransaction, and T³ransmediation. Exponentially, it is the most powerful when all four elements interact as a dynamic system of interdependence. Transformative pedagogy, based on the work of Freire (1970), connects the classroom to the political, economic, historical, cultural, ecological, and social issues of real life. At the heart of teaching and learning, an educated citizen is viewed as one who can "read the world," think critically, question relationships of power, and become an agent of social change.

Reflecting on our traditional school experiences as a staff, we knew that we had never been supported to learn and think in this way. As a learning community, we needed to learn and experiment with the process ourselves. Drawing upon readings from critical literacy (Fehring & Green, 2001; Lankshear & McLaren, 1993; Muspratt, Luke, & Freebody, 1997), we saw that popular culture (movies, TV serials, toys, fashions, MTV) and the media (magazines, commercials, newspapers) were obvious starting points because we are constantly bombarded and saturated with images and messages attempting to influence and construct our identities and desires. Our reading allowed us to view the world through a lens of critique, questioning who benefits, who is marginalized, and whose voice is and is not represented for what reasons.

The following reflective questions and comments indicate the growing critical consciousness within our staff while we examined demographic data, literature, and websites for various research purposes.

- "The word 'minority' gives the impression that certain ethnicities are minor versus major, creating the connotation that a minority is less important."

- While examining oil paintings by Herb Kane (1997) in his book, *Ancient Hawaiians*, depicting life in Hawai'i during the late 1700s, Malia exclaims, "Heh, here's Captain Cook and other European sailors but they don't call them 'ancient Europeans'? Why are only the Hawaiians 'ancient'? They were living at the same time."

- "Can you believe that the only information I found on the Internet pertaining to Queen Kapiʻolani was about the hotel in Waikīkī, discount rates, and fly ʻn drive vacation packages? As a famous Hawaiian monarch it's so shameful that she is not represented as royalty and embodied only in economic tourism and commercialization."

These are just a few examples revealing how Hawaiian history, culture, and racial identity are and are not represented in various forms of "texts," such as population census data, print, electronic, and visual media. They illustrate how we as teachers and educational assistants began learning to unpack, or deconstruct, dominant social, political, and cultural ideologies that are often embedded in language, go unquestioned, infiltrate our psyche, and silently shape our social identities, cultural, and political relationships with one another. We began to understand how words such as *ancient* erases a cultural heritage as if it were nonexistent and buried as ancient civilizations of Greece and Egypt. We helped each other to reveal or deconstruct how negative stereotypes and racism are often projected and reified in dominant mainstream texts and forms of media. We have found that Native Americans are stereotypically depicted as savages, people from China as kung-fu experts, Hawaiian males as primitive cavemen, Hawaiian females as hula dancers in grass skirts entertaining tourists, and African Americans as criminals.

Transformative praxis urges us to deconstruct these stereotypes and reconstruct them by researching, interviewing, reading, writing, illustrating, and producing culturally relevant instructional materials to offer the world positive and realistically authentic representations to use in classrooms. This position allows multiple voices and worldviews to enter the picture.

Transformation is a rare phenomenon. It is not specifically linked to education, although this is very much the kind of experience we would like to support and even encourage. The notion of transformation as an instrument of profound, positive, personal, and societal change allows learners to process more deeply with invested thought, time, effort, and emotion.

Transformation is about acknowledging relationships, seeing things differently, feeling our diversity in our universality, challenging old assumptions with extraordinary insight and intent. Learners are encouraged to actively get beyond

prescribed answers and to discover ideas that speak to new and novel thoughts and answers. It infuses relevancy to learning and challenges teachers and students to address today's pressing needs and the major difficult issues of our time.

A truly transformative educational experience has the capacity of assisting all of us to vision ways of building a better world and understanding our mutual place in it. What causes homelessness? Why do we have wars? Is capitalism a good thing? What is good and bad about it? Real-world relevant learning experiences tug and pull the innate potential of students' curiosity to innovate and create as a profound experience of discovery.

Educate originates from the Latin root, *edos,* meaning to educe or draw out. This is what education should be about. Standardized testing and rote learning are not what education should be about. Transformation is the zone where new knowledge and ideas are generated. We envision education and a deeper understanding and appreciation of culture(s) as engines for social change, projecting humane futures—futures in which a democratic ideal is realized for all.

Transformative processes produce the most powerful exponential effects of praxis because of its broader application beyond the walls of the classroom. The T⁴ process does not exist in a vacuum, nor can it function successfully without its animating principle—culture—and all that this rich word conjures for various groups in divergent settings. While T⁴ explicates a pedagogical framework that defines the *form* of teaching and learning, we want to define the *function* of teaching and learning, thus reinstating a cultural context.

Culture as Education

All learning environments constitute a unique blending of cultures. The word *culture* originates from the Latin root, *cultus,* to care and to cultivate. Many of the most experienced caretakers of our children understand what it means to cultivate and care for the unique gift in every child. Therefore, culture is really getting into the deepest part of our educational waters. Culture as education is about caring for our children in order to draw out their potentials and acknowledge the deepest wellspring from which our children create and make meaning.

As social beings, our need to interact and to be in relationship with one another and to find the context for our stories is critically important, not only to the success and flourishing of our species but also to a broadening appreciation of views of the world that may be different from our own. Because systems are infinitely complex as they overlap with one another, culture as an educational foundation plays a central role within a successful 21st century context. Culture can be more broadly viewed as constituting four key elements that interface with the T^4 process as holistic influences moving toward a more democratic education of understanding systems of interdependence.

Home Culture

Home is the first and immediate part of our cultural ground. It is the compelling origin of who the learner is and where she or he comes from. It is about self and family, as well as the learner's ethnic identity, cultural heritage, genealogy, family background, and home language. A curriculum based on democratic principles begins with *what learners know* in such a way that affirms their identity, family stories, and cultural resources, or what Moll, Amanti, Neff, and Gonzales (1992) called "funds of knowledge." This opens the door to schooling where each learner comes to the educational conversation fully able to participate.

Host/Indigenous Culture

Second, this cultural continuum leads into a relationship of place. Each locale around the world has a host people or native/indigenous culture. Native and indigenous peoples of a particular geographic location are the original "hosts" of a geographic locale in which others are "guests." The host/indigenous culture of Hawai'i is Hawaiian. Host/indigenous cultures within the continental United States are the various Native American tribes. These cultures were defined by a sentient respect for all living things, of the land, its bodies of water, and the heavens above.

Historically, colonizers and settlers have not had the distinction of maintaining equitable and just relationships with the host/indigenous cultures they have come into contact with, and in no way would they be considered hosts of any place other than the home-ground from which they came. Perhaps host/indigenous cultures by nature were too hospitable, too gracious as hosts tend to be. To respect and

acknowledge the existence of a host/indigenous culture is critical because it sets into motion a mutually defined relationship of caring that should have been maintained and never erased. The hope for the future is that this idea will become reinstated and supported as foundational to educational curriculum for the continuing health of the world.

For some, the notion of being a "guest" is awkward. However, if understood in its proper context, as guests, perhaps a more equitable and sustainable rapport with the host/indigenous culture and their environment would necessitate a dramatically different kind of relational orientation that would mutually benefit all of society.

Local Culture

Local culture, the third point on the cultural ground, honors the questions: Who are our neighbors? Who do we go to school with? Who do we work with? What clubs or social groups do we belong to? Local culture is about hybridity and defined by the dynamic, blended mixtures of people, ethnicities, and associations that are unique, intimate, and personal. It is a multifaceted community within a geographic region, city, island (as Hawai'i), or even smaller settings such as schools, neighborhoods, workplaces, interest groups, chat rooms, learning teams, churches, clubs, and others. Local culture sets the stage for understanding relationship and interdependence, cultivating a mindset of respect, compromise, and exchange. Local culture is an extraordinarily rich amalgam defined by purpose, place, and the people within that community.

Global Culture

Finally, the fourth point of our cultural ground is what lies beyond our shores, the culture(s) of our global community. This intersection is also one of myriad differences, yet the notion of a global culture sets all of us in some kind of inter- and intradependent relationship orchestrated on a larger scale. Through honoring each distinct culture as having value, no more or less than any other, we can arrive at a deeper appreciation for what each of us has to contribute to the rich tapestry of the world.

Conventional education often privileges a dominant Euro-American or Western cultural frame of reference. A wider cultural lens interdependently framed as home, host/indigenous, local, and global cultures envisions an educational center that is not dominated by any one group but held open, where discussion is invited and where all are asked to participate.

Multiple views of the world reside on the contingent intersection of the T^4 processes with this cultural ground. Absent culture portends the absence of diversity; therefore, honoring culture is honoring difference, and, as in all of nature, healthy ecosystems such as the loko i'a thrive on a rich tapestry of diversity as an interconnected cultural ground of our humanity.

So What Does Teaching to the Fourth Power Look Like?

What does it look like when T^4 is multiplied by the effect of culture? An example comes from Kanu O Ka 'Āina, a Native Hawaiian Charter School in Waimea, Hawai'i. As you will see, all the elements blend together as a fluid, nonlinear, responsive system to the teaching and learning environment. We italicized each element within the system to highlight it in the text.

A combination of elementary, middle, and high school students became *producers of knowledge* when they published *The Fish and Their Gifts* (Stender, 2004) for a global community (see Figure 5). The story was written by Joshua Kaiponohea Stender, based on his experiences of fishing with his father from a very young age, and draws upon his *home*, *host*, and *local* cultures. It is about a young boy named Kekoa who is swept into the sea by a large wave while gathering shellfish. Kekoa is rescued and brought to the safety of his father by various fishes of the ocean. In return, Kekoa and his father pray to the god, Kanaloa, Protector of Fishermen, to bless the fishes. In answer to their prayers, Kanaloa grants each fish a gift of protection to keep them safe from their respective predators.

FIGURE 5 Student-published book
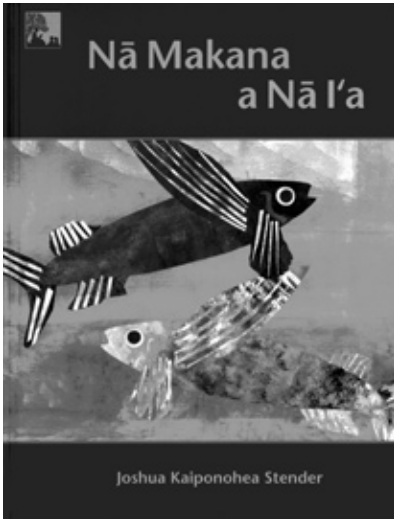
To write the book, Joshua made sure he had accurate and factual information by interviewing local fishermen and conducting research on the Internet and through books. In this way, he was *consuming knowledge* and illustrating T^1ransmission in action. T^1ransmission was embedded and visible throughout the writing process by attending to skills, convention, and mechanics, such as spelling, punctuation, vocabulary, organization, and story elements. This was a requirement in English as well as in Hawaiian because the book is published as a bilingual format. As a T^3ransmediational process, Joshua drafted and crafted his story by *interpreting knowledge* and his experiences into narrative form. In a collaborative, T^2ransactional, multiage learning environment, a team of elementary, middle, and high school students worked with Joshua and Meleanna Meyer to *use their knowledge* to illustrate the book. Once again, through the process of T^1ransmission, they researched the physical characteristics of the fishes and their environment. In addition, they learned about the indigenous palette (coral-white, turmeric-yellow, charcoal-black, and dirt-red) and techniques of collage. This book was then submitted and accepted for publication in order to touch a *global* community.

This example demonstrates the dynamic, responsive movement between T^1 and T^4 as interfaced with culture. Like the waters of the loko iʻa, all the elements are inclusive of each other and blend into a responsive, rich, healthy, learning environment working as a complex, interdependent system.

Implications for Teaching and Learning

What have we learned from our self-reflexive examination? How have we moved from theory to practice in order to make a difference? We find that often theory attempts to name and figure things out before actual practice and application. Theory prefigures word or text because it comes from a different place—intuitively, emotionally—that is pregutteral. Action makes theory concrete and expressive. Action comes from purposeful inquiry. Although still in the initial stages of empirically measuring the impact of this ecological, theoretical framework, we share what the journey has revealed thus far.

First and foremost, we realized that we had to "name" and articulate what T^1, T^2, T^3, and T^4 looked like. On the basis of our personal experiences, the classroom practice of others, and professional readings, we saw glimpses of good practice but never as a cohesive, conceptual heuristic. The examples in this article helped us piece together and "see" a progression of higher order thinking skills and what each "T" looked like. We became aware of the educational ceiling at the T^1ransmission level and how it so often distracts us because of its testable and measurable outcomes. It was not sufficient in and of itself, as a stand-alone.

Breakthroughs came when teaching and learning were connected to the outside world, where students and teachers were really making a difference or contribution in authentic ways, as producers of knowledge as in *The Fish and Their Gifts*. All of the Ts became evident as a nested, cumulative phenomenon. The great thing about T^4 is once you get there, often, you never want to go back; you want to know how to get there again and, perhaps, be able to take others along! We feel that this is an exploration of possible futures. For us, it shifted our consciousness about the purpose of schooling.

Second, cultural relationships are organic and cannot be categorized as a one-size-fits-all. The form and function of democratic, educational spheres must not be void of the valuable contexts of the world's richly nuanced and complex cultural arena. Therefore, we have synthesized our educational inquiry into an exponentially powerful, integrated theory in which culture is a foundational *piko* of pedagogy as an interdependent, dynamic, and thus transformative system. The cultural metaphor of the nutrient-rich loko iʻa assists us in shifting our consciousness and remembering the importance of this coexistence, much like its blending of freshwater and saltwater systems. As teachers, we continue to question and

search for ways to envision an interconnected global community as related to cultural sensitivity and diversity in the global future of our students. Thus far, our inquiry helps us to see that literacy in its myriad forms, curriculum, and instruction must serve broader functions beyond that which is often rendered from sterile, scripted programs.

Third, we are learning that allowing students to make connections between disciplines as interpretive spaces complicates testing and assessment of learning beyond what exists in quantitative terms. Evaluation is no longer neat and contained within the boundaries of a single domain. A creative and liberated mind is not necessarily measurable. Measurement works effectively on mechanical objects so they can be replicated. If the purpose of education is to create thinkers, lifelong learners, and future leaders as educators, administrators, and policymakers, the gaze of accountability and surveillance should be recast on those who thwart the exponential powers of teaching, creativity, and liberated thinking.

Finally, as we share and present this multidimensional, ecological framework with other educators at research conferences, there has been broad appeal from university through elementary levels, as well as practitioners from all disciplines. Although we first conceptualized the theory for social justice purposes and for the need of culturally relevant pedagogy, we have received encouraging feedback that this heuristic is a life model with broad and far-reaching ramifications. Teaching to the Fourth Power with a cultural piko is helpful and relevant to any life context, applicable for all learners, including those in dominant, mainstream educational contexts.

Seen in its totality, the meaning of aʻo, teaching and learning, is profoundly about transformative interrelationships. You'll know you've gotten there because awe, gratitude, and wisdom are the byproducts of such a learning experience of such depth. Educators engaged in searching for ways to sustain healthy learning environments and supportive points of view nurture unique voices and contributions that are central to education as positive social change. One of our staff members, Kuʻulei Laumauna, commented that perhaps the next T is "Transelevation," the place from which revelation and wisdom emerge. Such thinking is an indication that our conversations will continue to keep us on our journey. Herein lies our humanity and hope for the future.

References

Benham, M. K. P., & Cooper, J. E. (Eds.). (2000). *Indigenous educational models for contemporary practice: In our mother's voice*. Mahwah, NJ: Erlbaum.

Benham, M. K. P., & Heck, R. (1998). *Culture and educational policy in Hawai'i: Silencing of native voices*. Mahwah, NJ: Erlbaum.

Bourdieu, P. (2001). *Language and symbolic power*. Cambridge, MA: Harvard University Press

Cope, B., & Kalantzis, M. (Eds.). (2000). *Multiliteracies: Literacy learning and the design of social futures*. London: Routledge.

Dewey, J., & Bentley, A. (1949). *Knowing and the known*. Boston: Beacon.

Fehring, H., & Green, P. (Eds.). (2001). *Critical literacy: A collection of articles from the Australian literacy educator's association*. Newark, DE: International Reading Association.

Freire, P. (1970). *Pedagogy of the oppressed*. New York: Seabury Press.

Freire, P. (1998). *Teachers as cultural workers*. Boulder, CO: Westview Press.

Gardner, H. (2000). *Intelligence reframed: Multiple intelligences for the 21st century*. New York: Basic Books.

Giroux, H. (1988). *Schooling and the struggle for public life*. Minneapolis: University of Minnesota Press.

Harste, J. C. (2001). What education-as-inquiry is and isn't. In S. Cakmak & B. Comber (Eds.), *Inquiry into what? Empowering today's youngsters, tomorrow's citizens*. Urbana, IL: Whole Language Umbrella/National Council of Teachers of English.

Kamehameha Schools. (1991). Office of Program Planning and Evaluation Rep. No. 12-91. Honolulu: Kamehameha Schools/Bishop Estate.

Kane, H. (1997). *Ancient Hawai'i*. Captain Cook, HI: Kawainui Press.

Kaomea, J. (2003). Reading erasures and making the familiar strange: Defamiliarizing methods for research in formerly colonized and historically oppressed communities. *Educational Researcher, 32*, 14–25.

Lankshear, C., & McLaren, P. (Eds.). (1993). *Critical literacy: Politics, praxis, and the postmodern*. Albany: State University of New York Press.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, England: Cambridge University Press.

Leland, C., & Harste, J. (1994). Multiple ways of knowing: Curriculum in a new key. *Language Arts, 71*, 337–345.

Luke, A. (1988). *Literacies, textbooks and ideology*. London: Falmer Press.

Machado, M. (1999). *Voices of wisdom*. Kula, HI: Aka Press.

McLaughlin, M., & DeVoogd, G. (2004). *Critical literacy: Enhancing students' comprehension of text*. New York: Scholastic.

Moll, L., Amanti, C., Neff, D., & Gonzales, N. (1992). Funds of knowledge: Using a qualitative approach to connect homes and classrooms. *Theory Into Practice, 31*, 132–141.

Muspratt, S., Luke, A., & Freebody, P. (Eds.). (1997). *Constructing critical literacies*. Cresskill, NJ: Hampton Press.

Purcell-Gates, V. (Ed.). (2007). *Cultural practices of literacy: Case studies of language, literacy, social practice, and power*. Mahwah, NJ: Erlbaum.

Rosenblatt, L. (1994). *The reader, the text, the poem: The transactional theory of the literary work* (Rev. ed.). Carbondale: Southern Illinois University Press. (Original work published 1978)

Scribner, S., & Cole, M. (1981). *The psychology of literacy*. Cambridge, MA: Harvard University Press.

Stender, J. (2004). *The fish and their gifts*. Honolulu: Kamehameha Schools.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wells, G. (1986). *The meaning makers*. Portsmouth, NH: Heinemann.

About the Authors

Anna Y. Sumida is a doctoral student at the University of Hawai'i and a resource teacher at Kamehameha Schools Kapālama Elementary School. Meleanna A. Meyer is an artist and cultural arts education specialist designing curriculum, most notably for Native Hawaiian Charter Schools, workshops, and arts residencies throughout the state.