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Storywork Across the Landscapes of Home and School:
Towards Indigenous Futures in Thailand

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Abstract

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Placed in an urban Indigenous school in northern Thailand, this dissertation makes visible ways that educators, young people, and their families collaboratively designed to expand possible Indigenous futures as a school. In a three-year participatory design research (Bang & Vossoughi, 2016), I explore how Tutoría, a pedagogy from Mexico that was initially introduced to disrupt dominant relations of power and expertise among teachers and students, evolved and expanded to include families' land-based knowledge system, and their generative navigations across schools and home. Focused on the case of Sahasat school, I examine how teachers in particular, shifted how they re-imagined the politic and purposes of school through living out ethically different teaching and learning relationships with students, families, lands and each other. In Article 1, I examine the stories of teachers as they design with Tutoría (Cámara, Castillo Macías, de Ávilar Aguilar, et al., 2018; Rincón-Gallardo & Elmore, 2012). The Tutoría dialogue, practice, and system of learning intervenes in powered hierarchies in school and is a kind of participatory design that reaches for conviviality; that is, conditions of learning where individual

freedoms are maximized through radical interdependence for the renewal of local communities' lifeways and environments (Escobar, 2018; Illich, 1973). I find that through storywork (Archibald, 2008), teachers made sense of their roles and responsibilities to state-directives, young people, families, and tribes in increasingly heterogeneous ways that mattered for collective sense-making and social dreaming at school (Espinoza, 2008). Article 2, brings us to the landscapes and stories of two young people's homelands, a Hmong and a Lanna Thai family. Through walking and storying lands with families (Bang et al., 2014; Marin & Bang, 2018), I illustrate how mathematics from within Indigenous contexts is often grounded in families' axiologies in land – the ways that they come to know who they are and how to be in the world. Finally, in Article 3, I focus the analysis on unfolding dialogues between six teacher-student pairs, where young people were tutors to the adults-learners on an important practice from their homelands. I use social poetics as a framework to examine how moment-to-moment interactions can expand or foreclose emplaced possibilities for ethical and political shifts at school (Shotter, 2010). Sahasat's case generates learning theory on how participatory designs and processes of partnership shift over time because of distinct subject-subject-object relations, and the importance of stories and land within that. It illuminates potential pathways of school-based work and teacher education towards Indigenous futures. It also adds to current literature by illustrating the ways self-identified Indigenous people in Asia are continually building and advancing movements for self-determination that are deeply relational, responsive, and responsible to lands and each other.

Keywords: storywork, Indigenous education, Thailand, Tutoría, designing with homelands, mathematics, participatory design research, teacher education

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Ana, Tutoría student, Zacatecas, Mexico

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From *Fifteen* by Peachy Lopez

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“ขอขอบคุณพ่อเกรียงไกร ชัยคำ แม่สัมฤทธิ์ ปัสสาจันทร์ พี่สุกัญญา อุปลจักร พี่ปาริชา ไตรถาวร พี่จิระศักดิ์ อินทะเนน และพี่หนิง (สุภาวดี ผู้ล่วงลับไปแล้ว) ครอบครัวเราครั้งที่ได้อาศัยที่ชุมชนบ้านแคว้ง อำเภอแม่จิม จังหวัดน่าน ผู้ได้บ่มเพาะลูกและน้องสาวคนนี้ ความสุขกับการได้เล่นสนุกสนานและใช้ชีวิตกับพ่อแม่และพี่ๆ ในสภาพแวดล้อมที่เป็นธรรมชาติล้อมรอบด้วยป่าเขาลำธารในบ้านพักครูที่อยู่ติดกับโรงเรียน ทุ่งนา สายน้ำแปลงผักหลังบ้าน เล้าไก่ได้ถุนบ้าน ร้านขายของหน้าบ้าน ต้นดอกคุณนายต้นสายและดอกเย็บีร่าหน้าบ้าน นกแก้วและกระต่ายที่เราเคยเลี้ยง พื้นดินที่เราเล่นได้ถุนบ้าน บ้านไคบ้าน พื้นที่และสิ่งต่าง ๆ ของโรงเรียนบ้านแคว้ง เช่น เสาธงชาติ สนามกีฬา บ่อเลี้ยงปลา แปลงผัก และคันมะม่วงริ้วริ้วในโรงเรียน อีกทั้งการได้ช่วยเหลือเกื้อกูลกันของคนในหมู่บ้านแคว้ง ที่ได้มีส่วนหล่อหลอมความสุขในวัยเด็ก ความสุขในการได้เรียนรู้ในโรงเรียนและในชุมชนที่มีธรรมชาติสมบูรณ์

นอกจากนี้ขอขอบคุณ พี่ธาวิณ คงแก้ว ที่คอยสนับสนุนการทำงานและการเรียนรู้ต่อเนื่องในวันที่เรามีครอบครัวของเราเอง การสนับสนุนที่ทำให้เราสามารถทำงานด้วยแรงบันดาลใจอยากเห็นเด็กไทยได้มีความสุขในการ

เรียนรู้และแบ่งปันให้กับคนรอบข้างเพื่อความสุขในการดำเนินชีวิตที่ช่วยเหลือเกื้อกูลกันในสังคมไทย และขอขอบใจ ลูกชาย แชม ธิทัช คงแก้ว ที่ชีวิตของหนูทำให้แม่ได้เรียนรู้และเข้าใจความรักมากขึ้น

สุดท้ายนี้ขอขอบคุณพระเยซูสำหรับแบบอย่างแห่งความรักแท้ และความรักผู้อื่นที่เป็นแรงขับเคลื่อนให้ แสดงออกถึงความรัก ความเอาใจใส่ และการแบ่งปันให้กับคนรอบข้าง ขอขอบคุณพระองค์ที่นำให้ได้มาพบกับเมซี่และครอบครัวของเมซี่ผู้ที่มีความมุ่งมั่นจริงจังและจริงใจในการช่วยเหลือคนไทย ช่วยเหลือนักเรียน ครู และโรงเรียนในประเทศไทย และขอขอบคุณทุก ๆ สนับสนุนจากแพม จิราธิวัฒน์และครอบครัวอาจารย์กอบชัยและอาจารย์นลินี จิราธิวัฒน์ และขอขอบคุณผู้นำและสมาชิกทุกคนในครอบครัวคริสตจักรแห่งนิมิตพิษณุโลกที่เป็นแบบอย่างแห่งความรักเสมอมา”

For everyone in my family and the community that shaped my identity

To my family, my father, Ajarn Kriengkrai Chaikam, my mother, Ajarn Samrit Passajan, my siblings, Ajarn Sukanya Upajak, Khun Paricha Traithawon, and Pol.Sub-Lt. Jeerasak Intanane, and P’Ning Suphawadee.

To our family when we lived in a small village, Ban Kwang, Mae Charim, Nan, Thailand, shaping me to enjoy playing and living in the nature surrounded by mountains, rice field, clean and clear ditch, local houses and organic vegetable gardens.

To the house for a government teacher where my father raised some domestic fowls, planted some colorful flowers in front of the house, the parrots and the rabbits that we used to have.

To the ground under the house on which we spent most of our days playing. To the wooden stairs, school areas and trees.

To the supportive villagers who always gave me a hand and kept watching me and my old friends as their own children.

To my husband, Ajarn Thawin Kongkaew, who always support my work and learning journey.

To my son, Samuel Teetouch Kongkaew, who makes me learn to teach better.

To the students, teachers, and school administrators in Padoongrasdra School, Chiangrai Vidthayakhom School, Sahasartsuksa School, and Charoenrasdr School.

To Pam Petra Chirathivat and her parents, Ajarn Kobchai - Nalinee Chirathivat.

To CVC Phitsanulok leaders and members.

To Meixi Ng, Alison Ling, and John Ng, the example of those who are never exhausted to help us Thai people.

To Jesus for His example of simplicity and true love.

พันทิวา ที่จำปา *Khun Panthiwa Theechumpa*

คำอุทิศแด่ คณะครู โรงเรียนสหศาสตร์ศึกษา จ.เชียงราย

ข้าพเจ้าขอขอบคุณคณะผู้บริหารและคณะครูทุกท่านในโรงเรียนสหศาสตร์ศึกษา จ.เชียงราย ที่เปิดใจนำวิธีการเรียนรู้ในรูปแบบปฏิสัมพันธ์ทิวทอเรียมาใช้ในการเรียนการสอนของโรงเรียนในระดับชั้นต่างๆ ตั้งแต่ชั้นประถมศึกษาตอนปลาย จนถึงมัธยมศึกษาตอนปลาย วิธีการเรียนรู้นี้เป็นวิธีการที่เรียบง่ายแต่เต็มไปด้วยพลังบนแนวคิดที่คุณครูแต่ละท่านได้เปิดใจและเชื่อมั่นในศักยภาพของนักเรียนแต่ละคนที่คุณครูได้สอน จากจุดเริ่มต้นนี้เอง เป็นสิ่งที่นำการเปลี่ยนแปลงมาสู่โรงเรียนสหศาสตร์ศึกษานับแต่นั้นเป็นต้นมา จากการที่ข้าพเจ้าได้ทำงานร่วมกับคณะครูและนักเรียน พบว่านักเรียนเกิดการเรียนรู้อย่างเป็นธรรมชาติ มีความสุข มีความมั่นใจในตนเอง ความภูมิใจในครอบครัว การเชื่อมโยงความรู้ของที่บ้านกับรายวิชาต่างๆ ในห้องเรียน รวมถึงความสัมพันธ์ที่สนิทสนมยิ่งขึ้นระหว่างนักเรียนกับนักเรียน นักเรียนกับครู ครูกับครู และโรงเรียนกับครอบครัว จากวันนั้นมาถึงปัจจุบันนี้ นับเป็นระยะเวลากว่า 5 ปี แล้วที่จุดเริ่มต้นเล็กๆ ได้เติบโตขึ้นอย่างเป็นธรรมชาติและเข้มแข็ง ข้าพเจ้ามีความภูมิใจเป็นอย่างยิ่งที่ได้เป็นส่วนหนึ่งก้าวสู่การเป็นสังคมแห่งการเรียนรู้ในโรงเรียนแห่งนี้และเชื่อว่าโรงเรียนต่างๆ มากมายในจังหวัดเชียงรายจะได้รับสิ่งดีผ่านทางโรงเรียนสหศาสตร์ศึกษาอย่างแน่นอนค่ะ

This dedication is for the teacher team at Sahasartsuksa School in Chiangrai Province, I appreciate the team of the administrators and all of the teachers at Sahasartsuksa School in Chiangrai Province for opening their minds to adopt Tutoria Relationship Learning Approach in their classes, from the upper primary school level to the high school level. This learning approach is simple, but it's full with power of ideas when each teacher opens their minds and when they are confident in the capacity of each student. From this, Sahasartsuksa has been changed since then. After I have worked with the team of the teachers and the students, I have found the changes. Students begin to learn spontaneously. They have shining eyes and they are happy and confident in themselves, and proud of their families too. There are connections between their knowledge at home and the subjects studied in their classrooms. Moreover, the relationships have become even closer between students and students, students and teachers, teachers and teachers, and school and family. From that day until the present, it has been more than 5 years, and this small start has continued to grow organically and in strength.

ด้วยรักและผูกพัน *With love and dedication,*

พันทิวา ที่จำปา *Khun Panthiwa*

Meixi

แต่ทุกคนที่ประสบกับความยากลำบากกับปัญหาต่างๆ ในโรงเรียนและรู้ว่าสามารถทำให้แตกต่างจากเดิมได้
To all those who have struggled in school and know things can be different.

อมรรัตน์ ปินวรรณ *Khun Amornrat Pinwanna*

งานวิจัยชิ้นนี้ เกิดจากความห่วงใยระบบการศึกษาที่เด็กทุกคนถูกกำหนดให้เข้าไปปรับการพัฒนาศักยภาพของตนเองด้านการเรียนรู้ที่หลากหลาย จึงเป็นความทุ่มเทของผู้ต้องการปรับวิถีการเรียนรู้ร่วมกันของเด็กๆ ผ่านสังคมในโรงเรียน ซึ่งเป็นสังคมที่เด็กได้อยู่ร่วมกันและใช้เวลาด้วยกันมากที่สุด งานวิจัยชิ้นนี้จึงเป็นประโยชน์อย่างยิ่งสำหรับผู้ที่มีส่วนเกี่ยวข้องกับการจัดการศึกษาที่ต้องการเห็นรูปแบบการจัดการเรียนรู้ที่ยั่งยืนอย่างแท้จริง สามารถสร้างเด็กๆ ให้มีรูปแบบการเรียนรู้ของตนเอง และถ่ายทอดไปสู่บุคคลอื่นได้ ในฐานะที่เป็นส่วนหนึ่งที่ช่วยเป็นแรงผลักดันในการจัดการเรียนการเรียนรู้ผ่านการถ่ายทอดแบบทิวทอเรียในโรงเรียน ขออุทิศผลจากงานวิจัยนี้แด่เจ้าของทฤษฎีการจัดการเรียนรู้ผ่านการถ่ายทอดแบบทิวทอเรีย อุทิศแด่คุณ Meixi Ng และทีมงานที่เป็นนักพัฒนาทางการศึกษาที่ผลักดันให้เกิดการพัฒนา รูปแบบการจัดการเรียนรู้ในโรงเรียน อุทิศให้คุณครูทุกคนผู้เห็นคุณค่าและศักยภาพในตัวเด็กนักเรียน จนยอมปรับเปลี่ยนวิธีการจัดการเรียนรู้ของตนเองเพื่อประโยชน์สูงสุดที่จะเกิดกับเด็กในอนาคต ขออุทิศแด่เด็กนักเรียนทุกคนที่แสดงออกถึงศักยภาพของตนเองจนทำให้ครูยอมรับและพร้อมที่จะร่วมสร้างองค์ความรู้ใหม่ๆ ร่วมกันอย่างไม่มีที่สิ้นสุด และอุทิศให้กับครอบครัวของเด็กนักเรียนที่แบ่งปันประสบการณ์ ถ่ายทอดความรู้จากรุ่นสู่รุ่นให้กับบุตรหลาน ทำให้ความรู้จากโรงเรียนเป็นเรื่องที่ใกล้ตัวเด็กมากยิ่งขึ้น งานวิจัยชิ้นนี้จึงแสดงให้เห็นว่าการศึกษาที่สามารถเชื่อมโยงความรู้จากครอบครัว โรงเรียน และสิ่งรอบด้าน จนทำให้เด็กรักที่จะเรียนรู้และพร้อมแบ่งปันให้กับผู้อื่น จะไม่ใช่การศึกษาในฝันอีกต่อไป

This study was started because of the concern on educational system which all children are regulated to access in order to improve their competence on various knowledges. This work comes from the commitment of those whose desire is to harmonize the ways the students learn together through a school community where children are and spend most of their time together. This study is very advantageous for those in educational management, for those who desire sustainable learning models that enable students to have their own ways of learning and be capable of teaching others. As a part of driving Tutoría Relationship learning approach at school, I would like to dedicate this study to the leaders of this learning system and practice, Tutoría Relationship, Meixi Ng and her team of education developers who drove this learning model at school.

Dedicated to the teachers who see the value and abilities in their students and who are willing to modify their teaching and learning approach for the students' benefits. Dedicated to all the students who have shown their potentials until the teachers accepted them and became ready to join in to create new knowledge together in a way that has no end. And dedicated to students' families who have shared their experiences and given their intellectual knowledge that has been passed down from generation to generation to their children and have made school knowledges closer to children's lives.

Chapter 1. INTRODUCTION

1.1 WRITING FROM PLACE

I begin this dissertation writing from place in Chiang Rai, Thailand. Many of these lands and waters have made who I am – the rice fields, the mountain ridges from Mae Chan แม่จัน to Mae Suai แม่สรวย, the deep night sky. Over the years, new roads have been built, new barber shops, and markets popped up. As I drive from ห้วยปลากั้ง (Huay Pla Kang) to Sahasat school today (Jan 9, 2019), I count five different coffee shops and see a new community center. I see the ถ้ำตูปู (Tam Tu Pu) – a beautiful green mountain cave towering in the distance today with the morning fog slowly rising. It has rained all day but that is strange for the cold season. Tam Tu Pu ถ้ำตูปู sits right behind the school, watching so many young people, including me and my Singapore and Lahu¹ family, grow up. Sahasat school is a large urban Indigenous school where all my friends went to and where this dissertation is placed. I remember the times I have walked these lands with songs and ran along in the grass fields playing pick-up soccer.

These lands hold stories (Bang et al., 2014; Goeman, 2008). Obvious are the surface stories is of development, with the new highways and roads, of the new coffee buzz, of the growing tourist industry, of shopping malls, of “modernity” in Chiang Rai. Digging deeper, these are not the only stories of these lands. The dissertation intentionally uncovers and make visible other stories of people and place that have been muted or rendered invisible by dominant neoliberal narratives of power. In particular, stories from Indigenous young people, families, and their teachers as they intersect within and across home and school life. With the permission of young people, teachers, and families, this dissertation holds stories of Indigenous strength, intergenerational wisdom and creativity, relationships of reciprocity with Land², and potential openings for Indigenous

¹ One of the 60 Indigenous groups in Thailand (Prasit, 2019).

² Land refers to the nuanced stories, systems of relationships with human and more-than-humans (e.g. including plants, animals, ancestors, and other relations across time), practices, histories, and hopes. It refers both to the (1) physical geography and the (2) philosophies, the living teachings, affective experience and ways of being of a place (Styres, 2017).

movements that advance Indigenous resurgence, self-identification and self-determination in Thailand (Prasit, 2019; Prasit & Meixi, 2018).

The following questions guide this dissertation:

1. How can schools be generative partners in expanding Indigenous communities' collective continuance – that is, how communities adapt “in ways sufficient for the livelihoods of its members to flourish into the future” (Whyte, 2014, p. 602)?
2. What happens over time, when researchers, teachers, Indigenous young people, and their families collectively design for teaching and learning relationships in Tutoría based in reciprocal co-creation, friendship, consent, and freedom as they move across and within the landscapes of home and school?

I belong to the Hokkien/Hokchiu-Chinese clans from Singapore. Another part of my identity also comes from Tam Tu Pu ถ้ำตูปู, the mountain ridges of Chiang Rai, the Kok River that runs through the city, Lahu lifeways, and Sahasat school. Both lands play a significant role in my own formation and identity during my growing years. Because of my long-time relationship with the lands of Chiang Rai and with Sahasat school, this dissertation is of particular personal significance to me. My own stories also weave into this work and has shaped our³ design from such a history and hope.

Image 1. Tam Tu Pu ถ้ำตูปู looking over Sahasat.



³ Research does not happen in isolation. Thus I intentionally use “our” and “we” when talking about our designs and collaborative work that this dissertation emerges out of.

Image 2. Coming in on boat on the Kok River with ถ้ำตุ้ปุ (Cave Tu Pu) to the north-west.



1.2 CHILDHOOD EXPERIENCES FROM CHIANG RAI TO SINGAPORE

As a 12 year-old, I remember my family taking our first trip to Chiang Rai, Thailand from Singapore. We arrived at a small village in ห้วยปลากั้ง (Huay Pla Kang) just outside the city and were welcomed with big hugs from Ajarn Marting, Ajarn Silat and his family. Ajarn Marting was head of the Lahu Council and Ajarn Silat was the to-be director of the hostel. They were two Lahu leaders embarking on a new project with Lahu young people. My family got to know Ajarn Marting and Ajarn Silat through mutual friends and we came to visit the project that they requested partnership on – a Lahu hostel for about 30 young people so that they continue on to secondary school in the city. My mom took my siblings and I and introduced us to Moli, Poten and Pola. “This is your sister, these are your brothers”, my mom told us. And from then on, we were family. Moli and many other took us in, showed us how to walk on the ridges of the rice fields, how to sit with the mountains who were watching over us, how to play brinjal and seed-bowling games at Christmas time, how to fall asleep with the stars, how to sing Lahu songs, how to drum and dance around the night fire. We played match-making games, we had fashion shows My brother says that even though our Thai or Lahu was not very good, we could always understand each other. My mom remembers the time we cooked curry chicken together, had soft drinks and ice-cream after the annual pig feast with the whole village. From then on, my family and I spent many cold seasons in that village.

Year after year, my families' continual participation in Lahu community life in Thailand grew to be a sharper and sharper contrast to my own life experiences. I remember how my friends spoke of wishing they spoke English like me, of how knowing Lahu was useless in a world like this, of how my friends were forced into marriages for the sake of their family. I would also remember sometimes going into class with my Lahu brothers and sisters at Sahasat school and trying to not be noticed by the teacher because I was not formally enrolled there. I remember feeling that home was so far away for so many of my friends as they lived in Chiang Rai city as going to school meant being away from family and village life nine months out of the year. Land-based knowledges like working with bamboo in construction or learning family traditions felt increasingly fragmented. Lahu language and lifeways was often seen as deficit by dominant Thai society. Most of all, I remember my friend Da who asked me to study for the both of us because she could not any longer. She asked me to keep studying so "this doesn't keep happening." I was 16 at that time. To a large degree, her ask drives my life's work. I'm trying and am slowly learning what it might look like to support Lahu communities as they reclaim their ways of knowing and connections to home and land.

I would also get upset that my family was part of facilitating such fragmentations with hostel life. At the same time, this is what the Lahu leadership wanted for their young people – it was all confusing as a kid. Some things never felt quite right. You would hear story after story of how being a highland Indigenous person limited hopes of being a teacher, of not being accepted by a partners' family, of never being good enough in Thai society. It quickly became apparent that issues of equity, the politics of difference were structural and routine (Prasit, 2019; Thongchai, 2000a; Vaddhanaphuti, 2005). They played out in state agendas to frame the "other" as a threat to national security that needs to be control and assimilation directives through state policies and the structures of school (Keyes, 2008; Keyes, 1991; Kwanchewan & Prasit, 2009; Prasit, 2019; Prasit & Meixi, 2018; Vaddhanaphuti, 2005).

It was a forced single story of who Indigenous people are or could be (Adichie, 2009). How could we design schools with radical relationality or as Ivan Illich (1973) calls, convivial modes of living so that we see begin to see each other – young people, families, teachers – within the complexity of their full lives, their multiple stories and relations? I explore this the following chapters.

1.3 FAMILY HISTORIES AND NAVIGATIONS

Building deeper relationships in Thailand at a kid also meant that we (my brother, sister, cousins, and I) grew up always navigating and moving across languages, knowledge systems, and cultures. My grandma, ah ma also tells of a time that this was not always the case or allowed. From her own experiences of needing to learn mandarin when the Singapore government banned Hokkien and Hokchiu radio stations and TV shows in the 1970s (Johnson, 2017), to having some dialects positioned as more important than others meant that as a result, I don't speak her language, Hokchiu.

Tracing even further back, our assimilation is almost so complete that ah ma does not know the mountains that her great-grandpa came from, just that we were mountain people, and that we have three long houses just outside China. My grand-uncle 舅公公 would tell me to keep remembering though. Ah ma also doesn't speak her grandmother's language. What we do have other traditions, ah ma's red rice wine, stories with the moon, lunar new year gatherings with more cousins that I can count. Experiencing the loss of stories and knowledges in my own family and life that seeing similar trends happen to my Lahu friends is part of the core of this work.

Assimilation also came with "benefits." Public education, English education was a huge investment by the government that loved their colonial masters, the English. I sat for national examinations that were administered and graded in England and speaking English opened doors. My dad could go to graduate school, I could go to graduate school, participate and benefit from capitalism.

I spent my undergraduate career trying to figure it out and find ways forward. I landed at Northwestern's school of education and social policy and how schools-community relationships rooted in history and land, mattered for justice across contexts⁴. I became a teacher at NorthLight school in Singapore and continued to see young people deeply wounded by school and internalized narratives of failure and deficit. I moved to Mexico to work with Gabriel Cámara and the Secretary of Education in a policy and program to disrupt powered constructions of expertise and how we were in relation with each other in school called *Tutoría* (Cámara, Castillo Macías, de Ávilas Aguilar, et al., 2018). It was in Mexico that I saw ways of building school life based in a continuous process of "convivial reconstruction" through the *Tutoría* dialogue, practices, and community of

⁴ I was mentored and guided in this work by Drs. Carol Lee, Jim Spillane, Jody Kretzmnn & Paul Artnson.

learning (Cámara, 2003; Illich, 1973). Constructing convivial collectives is a political vision to maximize individual freedoms based in radical interdependence (with humans and more-than-humans), to diversity modes of production so that local communities can “change and renew their lifestyles, their tools, their environments” (Illich, 2015 as cited in Escobar, 2004, p. 10; Illich, 1973). Tutoría, based in creating conditions of freedom, by matching anyone who has an interest to learn with another who has developing expertise in a particular topic (Cámara, 2003; Rincón-Gallardo & Elmore, 2012). It intentionally intervenes in normative power hierarchies in teaching and learning to create ones of consent, trust, and respect, conviviality (Cámara, 2003; Rincón-Gallardo, 2015). I explain the Tutoría practice and system in detail in Chapter 2.

In my time in Mexico, I stayed in rural community in Zacatecas, working in Tutoría across young people, teachers, the Redes de Tutoría team, and community members. Soon, I felt myself too, began to heal⁵. My journey has been one of (re)making, (re)pairing, (re)storying. Soon after I returned from México, former colleagues and I began working in Tutoría in schools in Singapore and Thailand (1 school in Singapore and then 4 schools in Thailand). Through this work I have come back to Chiang Rai, to Sahasat, back to family and I have found my way here to you.

1.4 WHY SCHOOL?

I find myself into this work through schools, not because schools are the only places to do this work, but because schools are places where young people often experience everyday epistemic violence, cultural erasure, repeated lacerations and fragmentations of our possible selves (Battiste, 1998; Marker, 2003; Olson, 2009). I have witnessed how colonized relations in schooling continues to deny fundamental heterogeneity of everyday life by valuing some knowledges over others and destructively focused on perpetuating logics of production and consumption (Bang, Warren, Rosebery, & Medin, 2012; Escobar, 2018; Heath, 1983; Illich, 1971, 1973; Rogoff, 2003; Rosebery, Ogonowski, DiSchino, & Warren, 2010).

I am a former teacher in Singapore at NorthLight school and then at Shuqun Secondary, and also have worked with teachers in México and in Thailand. I have felt the daily tensions of desiring something different for my students, needing to adhere to state exams while actively designing ways to participate in class to move to more humanizing and dignifying forms of

⁵ I have healed by being vulnerable, by sharing story, and finding meaning in learning at school. This work is documented in a paper I wrote, the Healing Power of Tutoría in 2012.

learning. I have been an unaware agent of the nation-state and have also designed with other teachers to think about how schools can be generative places for grassroots movements to gain support and political change. I continue to organize and build with other teachers with the Redes de Tutoría team in México, and have formerly worked with San Diego county's Juvenile Court and Community school district and Mapuche schools in Chile with Educación 2020⁶.

More than anything, I cannot stand on the sidelines when more and more children are disposed from their homes or sent to youth prisons, when more families and communities are seeing their lifeways erased with increased schooling, and we are increasingly imbalanced and violent as a human people because of it (Belcourt, 2018).

I share these histories because knowing who I am is knowing who I am connected to with my system of relations. My relations to across lands (to red rice, to families past, present, future) have helped me to remember that (1) the stories we tell matter and (2) how we listen to each other's stories also matter. Jo-Ann Archibald (2008) calls the processes of storytelling and storylistening, *storywork*. This paper theorizes how storywork sometimes disrupts macro-level systems of power. For example, designing for micro-level relationalities in how we interact, hold, and be in story with one another, can alter powered knowledge hierarchies and Indigenous erasure. Stories can enact, expand, and become the dignifying learning environments for each other that we seek to create in the world (Vossoughi & Booker, 2017).

I come to this research as a sister, daughter, aunty, and teacher, with both settler and colonized roots. This dissertation explores our journey to heal settled hierarchies of power – across students and teachers, teachers and teachers, teachers and families, school and home so that we better account for the heterogeneous ways that people make meaning and navigate their worlds. I suggest that openings for everyday acts renewal and resurgence in school could help strengthen our systems of relationships and Indigenous communities' collective continuance – again referring to a communities' capacities to adapt “in ways sufficient for the livelihoods of its members to flourish into the future” (Corntassel, 2012; Whyte, 2014, p. 602). A communities' collective continuance is based in cultivating strong moral relationships and responsibilities that members have to each other, to care and contribute to the well-being of their family, land, and community (Whyte, 2017). We have much to lose otherwise.

⁶ As of November 2019, I only continue to work with Redes de Tutoría in Mexico.

1.5 OVERVIEW & PURPOSE

The goal of this dissertation is to illuminate possibilities and pathways to Indigenous futurity in Thailand. Emerging from a three-year participatory design research (that is still ongoing) collaboration with a large urban Indigenous school called Sahasat school (Bang & Vossoughi, 2016), I study how we intervened with Tutoría to shift relational positions of power in ways that expand Indigenous futures and communities' capacities to socially dream together (Espinoza, 2008). My dissertation is divided into three manuscripts.

In the first manuscript, I trace shifts in our design at Sahasat school through the stories teachers told to each other. This paper is titled: “Our stories of school: Growing heteroglossia in design” and offers theoretical contributions by demonstrating how collective storywork opens up more humanizing and equitable forms of teaching, learning, and research (Archibald, 2008; Archibald, Lee-Morgan, & De Santolo, 2019). Dian Million (2014) writes that “[Stories] are a felt knowledge that accumulates and becomes a force that empowers stories that are otherwise separate to become a focus, a potential for movement” (p. 31-32). Through bringing “otherwise separate” stories across the landscapes of home and school, I ask: *How and in what ways did the politics and ethics of our participatory design research shift over time through stories?* I follow two sets of 17 teacher stories from two events (three years apart) and locate these stories within the context of Thai national education policies and global education reforms. I find that teachers' storywork (Archibald, 2008) – the storytelling and story listening with each other both seemed to help surface multi-voiced or heteroglossic (Bakhtin, 1984) alternate imaginaries of learning in ways that resonated with them *and* strengthened our collective resolve to design towards families' collective continuance at school (Whyte, 2017). Teachers' reflective sense-making of our designs also made visible the ethical deliberations of pedagogical choices that come with attempting to challenge formal constraints of colonizing and homogenizing school practices.

In the second manuscript, “Our stories of home: Mathematics from within families' axiological grounds,” I examine a key point of evolution of our design where we began walking and storying home villages with two families – one Hmong and one Lanna Thai. Within two multi-site case studies (Yin, 2013), I use epistemic network analysis (Shaffer et al., 2009), interaction analysis (Jordan & Henderson, 1995), and vulnerable observation (Behar, 1996) to illustrate the ways that home is a site of rich intellectual and ethical work. I use axiologies to refer to families'

underlying worldviews and value systems that guide of how they understand what is good, true, right and beautiful and how to be in the world (Bang, Faber, Gurneau, Marin, & Soto, 2015; Brayboy, Gough, Leonard, Solyom, & Roehl, 2011). I explore: *What mathematical practices emerge as families walk and story important places and practices in their community? How do families participate in and navigate the multiple systems of home, economic, and school life? Through self-reflection, in what ways did I/we, as outsiders, participate to “see” mathematics with families on these walks?* Using the two cases, I illustrate (1) how mathematics practices exist within multiple systems of relationships that families navigate every day and (2) how families’ homeland-based mathematical practices carried integral theories of being that uphold families’ responsibilities to human and more-than-human life in the village and forest. I suggest that rethinking mathematics from these grounds offers alternatives to extractivism-assimilation paradigms common in mathematics (Ascher, 1994; D’Ambrosio, 2009; Joseph, 1997; Klein & Simpson, 2017; Nelson-Barber & Estrin, 1995). Mathematics is often infused with normativity, sterilized of bias and political influence, and understudied in Indigenous contexts (Nelson-Barber & Estrin, 1995). This paper adds to current conceptions of mathematics from within Hmong and Lanna Thai knowledge systems. It also contains methodological contributions to growing literature on mobility and how land is an actor in the co-constitution of knowing in the learning sciences (Marin & Bang, 2018; Taylor, 2017).

Finally, in the third manuscript, I focus my analysis on unfolding student-teacher dialogues within a two-day design session where the same six young people selected an important family practice and designed a lesson from home to teach their teachers at school. In “Our stories of designing with homelands: Social poetics and possibility within teacher-student interactions,” I ask, *How and in what ways are subject-subject-object relations transformed with designing with homelands in Tutoría? What ethical and political emplaced possibilities are foreclosed or expanded for the young people and their teachers?* I use social poetics as a framework to examine how poetic moments of co-creation among teachers and young people have implications for how we change or reproduce relations of power, at the level of interaction and across the worlds of school and home. Through interaction analysis, I study the unfolding dialogue of six young people who designed lessons in school that begin with home knowledge and important family practices. This paper suggests that shifting the ethical qualities within everyday teaching and learning interactions have the potential to destabilize hegemonic relations in school in ways that sustain

and revitalize multiple forms of life. This research adds to a growing body of literature on community-based teacher education literature and how designing with homelands in Tutoría mattered for building collective imaginaries of change at Sahasat. Often theories of change in schools are focused on interventions in improving teaching pedagogy and practices. This dissertation foregrounds attention to the microinteractional within social dynamics as the first lever of social change. Attuning to the ways in which people learn, be in relationship with lands and each other, can “give us new eyes to see” the multifaceted and vibrant ways human communities make meaning in ways that matter to them. Beginning from this trajectory can make different sets of possibilities available for young people, families, and teachers in school (Rosebery et al, 2010; Lee, 2001). It generates learning theory from the ground up – from within designing and enacting learning together, as it dynamically unfolds. It is concerned with repositioning relations of power to make visible...

The purpose of my dissertation is two-fold. First, it generates learning theory on how participatory and community-based designs evolve and shift over time because of distinct repositionings and transformations of subject-subject relations (Bang & Vossoughi, 2016). Second, this dissertation contributes to much-needed scholarship in Indigenous studies by showing how self-identified Indigenous people in Asia are adapting and expanding their own possible futures and collective continuance, with implications for similar work in trans-Indigenous contexts. There are currently about 260 million Indigenous- identifying people in Asia, almost two-third of the world’s Indigenous population (Asian Indigenous Peoples Pact, 2010; Errico, 2017). This work grows out of a 18 year-long relationship with Sahasat School and hopes to add to ongoing movements for Indigenous education that persistently taking root in Thailand (Prasit, 2019; Prasit & Meixi, 2018).

Chapter 2. PLACE-ING SAHASAT SCHOOL

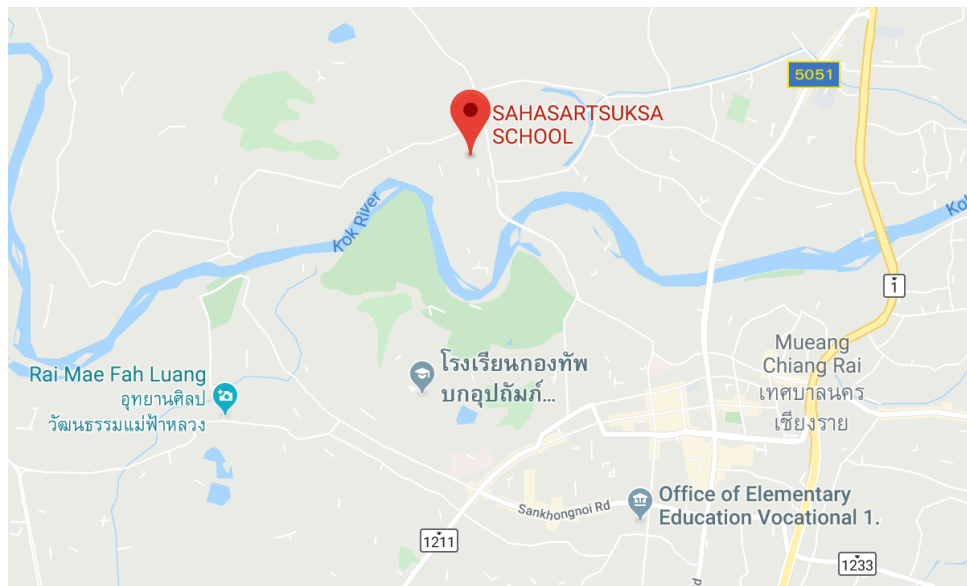
2.1 SAHASAT WITHIN ITS LOCAL CONTEXT

Sahasat school is a private welfare educational school โรงเรียนเอกชนการกุศลประเภทการศึกษาสงเคราะห์, one of eight of its kind in Chiang Rai province. Located in Chiang Rai city, Sahasat's buildings are in an urban area across the river from the downtown of Chiang Rai city (south of the Kok river). Sahasat receives government funding for all their students so that every student attend school for free, but is run privately. As an accredited school, Sahasat still follows the national curriculum and tests while having more managerial and programmatic flexibility. Sahasat's languages of instruction is Thai and also offers Thai-as-a second language classes for students that need it, teaches English on top of that, as well as tries to have students maintain their identity as Indigenous people in Thailand (Sahasat, personal communication).

Over the last 15 years the area where Sahasat is located has been undergoing rapid changes to and increasingly shaped by human-designed landscapes. Surrounding the school are a host of student hostels and villages similarly located north of the Kok River where the majority of Sahasat's students come to stay nine months out of the year. Each hostel has a range of 20 to 100 students and Sahasat has a hostel of its own for about 300 students, managed by some of their own teachers. There are 59 other hostels that Sahasat's students live in during the school year (Sahasat, personal communication).

At the beginning and end of every school day, mini vans, and trucks and buses driven by the heads of the hostel drive to ferry young people to and from school from those hostels. The school day typically begins at 7.30am and ends at 3.30pm. The school is divided into building which house the kindergarten, lower primary school, upper primary school, lower secondary, and upper secondary. There is a canteen, sports hall, and crafting and music room, along with a large football sized field in the middle of the school compound.

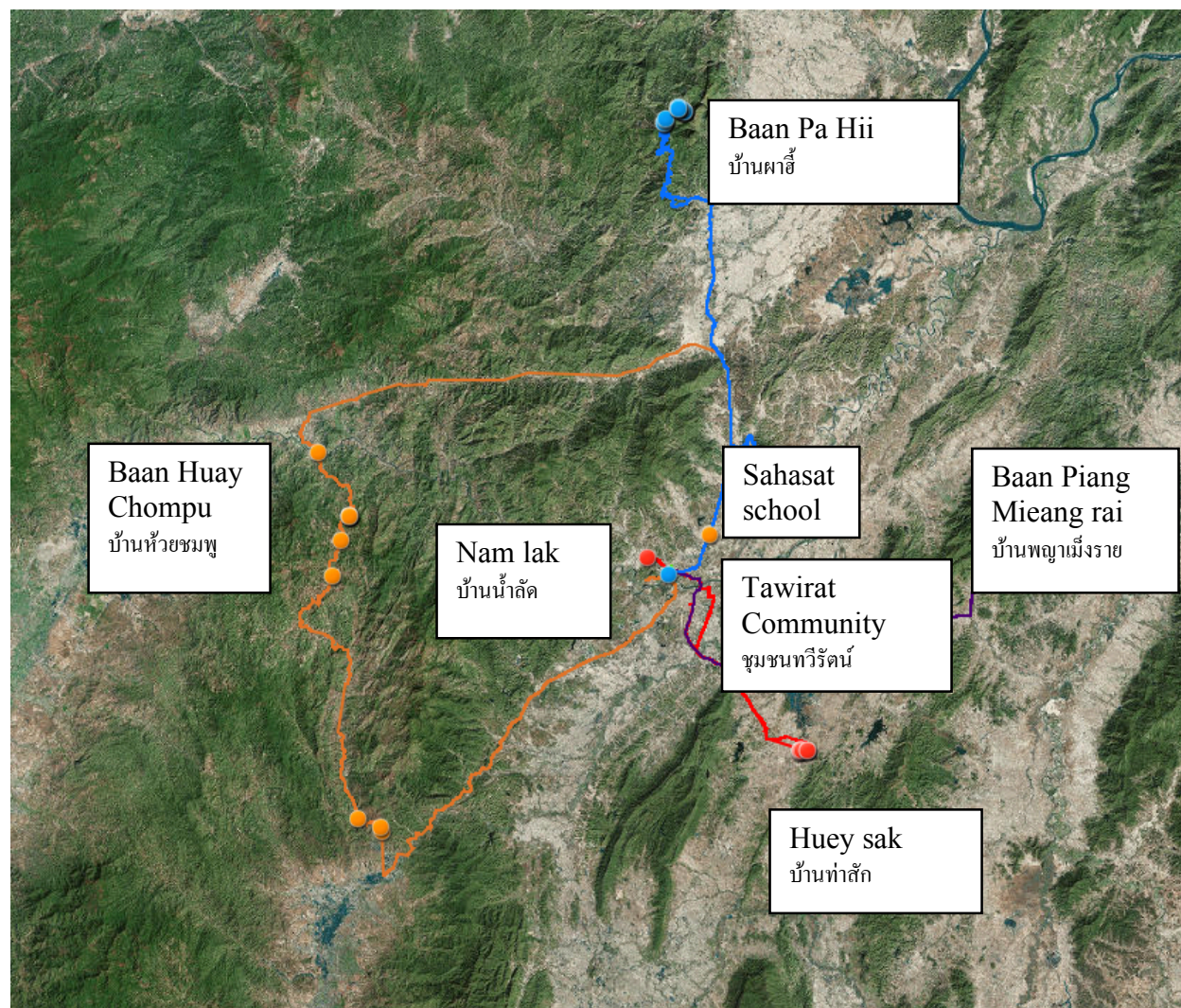
Image 3. Terrain view of Sahasat school in Chiang Rai



2.2 SAHASAT IN RELATION TO HOME LIFE

The young people from Sahasat come from over 300 home villages – from villages as close as the Karen village (Baan Nam Lak บ้านน้ำลัด) behind the school, to a three-hour car ride in the high mountains closer to the Chiang Mai province (Baan Huay Chompu บ้านห้วยชมพู), tucked within the mountain ranges that line the northern Thai-Myanmar border (Bann Pa Hii บ้านผาฮี้). Thus many of the young people at Sahasat call the mountains and forests their homelands. Image 4 provides a sample of six villages that we visited in the span of three years designing together with teachers and families.

Image 4. Sahasat and a sample of six villages that young people were from



2.3 SAHASAT SCHOOL IN ITS NATIONAL CONTEXT

Sahasat’s students come from around 13 different ethnic groups: Akha, Lahu, Karen, Hmong, Lisu, Yao, Chan, Thailue, Lawa, Chinese, Khmu, Plang, and Northern Thai (See Image 6). Most of these groups are highland tribes and with the exception of the Northern Thai students, are part of the 42 currently registered ethnic groups in Thailand, according to the National Council of Indigenous people in Thailand, with a population totaling over 4 million in the country (Prasit & Meixi, 2018).

The history and current state of Indigenous education in Thailand is complex and contradictory (Prasit & Meixi, 2018). Particularly since the Cold War, the extension of compulsory education for highland Indigenous peoples by the Thai-state was aimed at “civilizing” and

assimilating non-Tai ethnic peoples into a cultural homogeneity of “Thai-ness” or *ความเป็นไทย* *kwarm pen tai*) (Keyes, 1991). This came about for a few reasons. First, European colonization enforced a kind of boundary mapping of Siam, Thailand’s name prior to 1939. To maintain Siam’s independence, Thai leaders between 1884 – 1993 had to undergo negotiations with the French and British where “geo-body (of Siam) was being created literally on paper” (Thongchai, 1994, p. 127). Multiethnic kingdom where diverse groups lived and worked under the same ruler; all habitants of the kingdom were their “subjects” classified by their residency, ethnicity and language were not encompassed in a new nation-state (Thaweessit & Napaumporn, 2011). Education thus became a tool to prevent the fragmentation common to the pre-modern states, Thai leaders undertook a nation-building project to demarcate both a territory and a specific population to unify the nation (Thongchai, 1994). They transformed a diverse population into a relatively mono-ethnic group and created a new “Thai” identity by conflating the concept of culture and nationality. In Thailand, compulsory state education tries to assimilate all ethnic-linguistic groups under the blanket of “Thai-ness” or *ความเป็นไทย* (Keyes, 1991).

During and after the Cold War, Indigenous communities in the border and highland areas of Thailand were see as communists threats, a site of forest destroyers, and drug production (Hongladarom, 1999). The need for education towards “Thai-ness” intensified in the Cold War era, where “Thai-ness” reflects the importance of ethnic homogenization in nation-building and modernization, where conversely, heterogeneity is a threat to national security and nationhood (Laungaramsri, 2003). “Thai-ness” translates into speaking Thai, practicing Buddhism, and having loyalty to the Thai state as a means to remediate cultural and social deficits of non-Tai groups (Keyes, 2008; Keyes, 1991; Prasit & Meixi, 2018). Through the formation of the nation-state to the Cold War, education was seen as a tool to forge allegiance to the Thai nation-state through centralized curriculum, language policies, and compulsory state education and testing (Goodman, 2013; Hyun, 2014; C. Keyes, 2008; Kwanchewan & Prasit, 2009; Vaddhanaphuti, 2005).

However, assimilation policies are further complicated by a multitude of actors in formal and non-formal education, border police schools, Royal projects, and debates surrounding what is an “appropriate” level of ethnic and cultural diversity as represented in the centralized national curriculum (McNabb, 1993). Growing concerns with the over-centralization of curriculum prompted a new education act in 1999 to have 30% be provided and developed by the local community, but this is not a yet reality in many schools, urban or rural (Prasit & Meixi, 2018).

Teachers often do not collaborate with local community leaders to develop and implement local curriculum (ibid).

Image 5. Student demographics at Sahasat 2017 (This table hangs on a school wall)

ข้อมูลนักเรียนจำแนกตามชนเผ่า ปีการศึกษา 2560
STATISTICS OF STUDENTS TRIBES 2017

ลำดับ NUMBER	เผ่า RACE	TRIBES		จำนวน TOTAL NUMBER OF STUDENTS		
				ชาย MALE	หญิง FEMALE	รวม TOTAL
1	ลาหู่	LAHU		301	351	652
2	อาข่า	AKHA		484	517	1,001
3	กะเหรี่ยง	KAREN		101	113	214
4	ลีซอ	LISU		25	34	59
5	เย้า	YAO		22	39	61
6	ม้ง	HMONG		84	107	191
7	ไทยใหญ่	CHAN		17	17	34
8	ไทยลื้อ	THAILUE		5	8	13
9	ละว้า	LAWA		20	11	31
10	จีน/จีนฮ่อ	CHINESE		12	6	18
11	ขมุ	KHMU				
12	ปลัง	PLANG				
13	พื้นเมือง	NORTHERN THAI		153	148	301
รวมทั้งสิ้น TOTAL NUMBER OF TRIBES				1,224	1,351	2,575

The impacts of colonization within urban schooling on Indigenous young people are *felt* as they navigate life in the city (Kwanchewan & Prasit, 2009; Million, 2008). Speaking Thai with an accent is framed as deficient when contrasted to Thai normativity and culture. Similar to how the label “English-language learners” often reinforces “deficit-oriented, uncomplicated, and uneven narratives about students” from non-dominant communities (Gutiérrez & Orellana, 2006, p. 503). Highland Indigenous students are “Thai-language learners” that need to become “Thai” in hopes of increased mobility in Thai society (Kampe, 1997; Vaddhanaphuti, 2005). Furthermore, despite the diversity within and across tribes, being “Thai-language learners” essentializes such a group and with it, comes assumptions about academic, social, and cultural deficits or disadvantages (Moll, 2000; Nasir, Rosebery, Warren, & Lee, 2006; Rogoff, 2003). Embedded within these

messages is that knowledge from home is regarded as less developed as compared to Thai or Western standards of modernity and systems of knowledge (Chandraprasert, 1997; Kwanchewan & Prasit, 2009). Thus, re-mediating powered relations of learning and teaching towards heterogeneity and Indigenous self-identification and determination is still political and contested.

2.4 SAHASAT SCHOOL IN ITS GLOBAL CONTEXTS: GLOBAL EDUCATION REFORM MOVEMENTS

Indigenous education in Thailand does not exist apart from the context of current global education reform movements. Thailand, while never colonized, always had strong ties to the West, its identities and ideologies (Harrison & Jackson, 2010). Such “allure of the West” (Harrison & Jackson, 2010) is also prevalent in the national Thai education system. For example, “global languages” like English and Chinese are offered in also every school and is valued more highly than Indigenous languages. This dominant narrative is further fueled by globalization, international economic cooperation, and global exchanges. These global phenomena not only continually shape the world we live in, but also connect our education systems in unprecedented way and drastically altered the nature of public schooling (Akiba & Legendre, 2009 as cited in Paine & Zeichner, 2012). The interconnectedness of the globe and by extension, education systems, has had unprecedented effect on teachers and their work and lives. In a complex web of relationships, national, subnational, and global pressures act upon local communities and educational policy directions are taken up in varied ways through an intersection of cultures and policies that try to match up to global standards and governance agendas (Paine & Zeichner, 2012; Totto & Plank, 2007).

Furthermore, there is heightened attention and visibility of teachers and the teaching profession but yet invisibility in the agency and power of teacher to actually make the decisions over their moment to moment curricular decisions (Robertson, 2012). Teachers are the center of attention in policy discussions but absent from the discussions and decision making process. Teacher are often framed as the problem - objects of governance, rather than important actors in the global conversation about how to improve educational opportunities in more diverse and locally driven ways. Professional learning settings often are sites that are used to move teachers towards global pressures to narrowly define student success with an emphasis to standards, and alignment to reform initiatives (Tabulawa, 2003).

Thailand's reliance on the Program for the International Student Assessment (PISA) scores to measure global competitiveness is one driving factor to based national education reform initiatives on Western ideas of production. On March 1, 2016, the Bangkok Post had a piece to "Declare education in a state of emergency" (Bangkok Post, 2016) citing the low PISA scores, the International Mathematics and Science Survey and the World Bank reports and their Thai national test, O-NET also "disastrous" where the average scores of O-NET in with of eight go the nine subjects as below 50%. The start of Teach for Thailand in 2013 is part of a national call to improve standardized scores and prepare young people for the workplace as it exists. The call to better prepare and develop pedagogical support for teachers in Thailand has often been taken up in ways that reify already dominant social relationships between schools and communities, and education in the service of unquestioned goals and ideals of economic production.

2.5 SAHASAT SCHOOL IN ITS GLOBAL CONTEXTS: TRANS-INDIGENOUS MOVEMENTS

Even if the Thai nation-state and its educational policies that are experienced by at the local school level are influenced and shaped by global education reform movements, local grassroots movements also challenge hegemonic controls of power (Tsing, 2005). Friction refuses the lie that "global power operates as a well-oiled machine" (Tsing, 2005, p. 6). Schools have the potential to extend settler-logics and also create the conditions by which counterhegemonic practices can be sustained.

2.5.1 *Who are the Indigenous peoples of Thailand?*

There are about 62 distinct non-Tai speaking groups residing in Thailand (Prasit, 2019). Among those were more than 60 dialect groups throughout the country and 10 highland ethnic groups were labeled "hill tribes" or ชนเขา (chao khao) in Thai, the Karen, Lua, Hmong, Mien, Lisu, Lahu, Akha, Khamu, Htin, and Mlabri (McCaskill, Prasit, & Shaoying, 2008). Previously known as ethnic minorities, or the "others within" (Thongchai, 2000), these groups are still not being officially recognized as Indigenous by the Thai government. However, highland leaders have been engaging in a process of self-definition to recognize themselves and their national movement as Indigenous peoples of Thailand. This group has chosen to call themselves Indigenous people, ชน

พื้นเมือง (chon pheun mueang) or ชนเผ่าพื้นเมือง (chon pao pheun mueang) or literally “people of the land.” The term chon pao phuen muang ชนเผ่าพื้นเมือง (was agreed upon and adopted by the committee members of the National Council of Indigenous Peoples in Thailand (NCIPT, สภาชนเผ่าพื้นเมืองในประเทศไทย in Thai) during the October 31, 2558 (2015) workshop at Inter-Mountains Peoples Education and Culture in Thailand Association (IMPECT) in Chiang Mai, Thailand (Prasit, 2019).

Indigenous people of the Greater Mekong sub-region have always “challenged the limits” (Prasit, McCaskill, & Kwanchewan, 2008) of nation-state education and continued to strengthen their own identities, practices, and lifeways. Within and beyond formal education, local communities have long been advocating and holding power for the self-determination of their own communities and the resurgences of community-based knowledges and practices, to (re)mediate the long-term impacts of nation-state education.

Since the 1980s, regional movements of Indigenous people in Thailand grew into national and transborder ones, building upon collective energies of other First Nations and Indigenous people in the Americas, in Oceania and beyond. A global flow of ideas (Appadurai, 1996) and connections to Indigenous alliances created momentum to form the Network of Indigenous Peoples in Thailand (NIPT) in 2007 to give voice to Indigenous issues in Thailand (Prasit, 2019) Indigenous peoples in Thailand have drawn on the concept of “indigeneity” being promoted by the United Nations as people who are not just first peoples but colonized or oppressed ones too (Baird, 2016). Thus, concurrent with the UN Declaration of Indigenous Peoples’ Rights in 2007, Indigenous Peoples’ Day in Thailand was celebrated publically for the first time in 2007 to recognize and celebrate distinct identities in relation to the nation-state.

Finally, I locate myself within these global cultural flows. I had introduced *Tutoría*, a grassroots movement from México, to schools in Thailand. While this paper does not explicitly go into different forms or the ways that *Tutoría* has been locally adapted to the Sahasat context, I am cognizant of my own body and person as a vessel for the spread and iteration of ideas over time and space. *Tutoría* in México was similarly introduced against the backdrop of dominant global narratives of global education reform – and was an intentional break-away from dominant, pre-existing forms of activity. This holds true our work in Thailand, and in particular for many of the teachers at Sahasat school.

I locate Sahasat's case study in the context of both global education reforms and global Indigenous movements to reaffirm the specificity of this case while always remaining cognizant of the relevant Indigenous global (Allen, 2012). It also addresses a seeming paradox that arises within encounters between transnational forces in revitalizing place-based Indigenous knowledge systems within nation-state institutions.

2.6 SAHASAT WITHIN THE TUTORÍA MOVEMENT

2.6.1 *History of Tutoría*

This work with Sahasat also takes place within a larger Tutoría pedagogical movement that originated in Mexico. Tutoría is both a practice and form of organizing teaching and learning. It was conceptualized, iterated, and practiced under the leadership of Gabriel Cámara, a close collaborator with Ivan Illich and Paulo Freire since the 1970s. Over the years, the Tutoría network has become a grassroots movement that is sometimes supported by educational policy. It is driven by educators and public school teachers, young people, and families in México who have been reclaiming the right, practice, and desire to re-imagine their schools to be generative places of freedom, generosity, and solidarity, spaces that allow us to become more fully human (Cámara, et al., 2018).

Tutoría finds deep theoretical and ethical alignment with work in the learning sciences – they are fundamentally concerned with designing for and making visible the ways young people have deep expertise within heteroglossic collective communities of practice (Brown & Campione, 1998; Gutiérrez & Rogoff, 2003; Lave & Wenger, 1991; Lee, 2001). *Tutoría* is to “profoundly trust in people and their creative power” (Freire, 1970, p. 73), to maximize conviviality, or “individual freedom realized in personal interdependence” (Illich, 1973, p. 24). It is an act of friendship, from one who has something to offer to another person who wants to learn it (Cámara, et al., 2018). Through offering ourselves freely to one another in dialogue, we work towards entering into communion and poetic co-creation with another (Freire, 1970; Shotter, 2010). I suggest Tutoría creates the “conditions for convivial work are structural arrangements that make possible the just distribution of unprecedented power” (Illich, 1973, p. 26).

Through a series of events and political administrations, *Tutoría* has undergone various transitions and forms (Cámara, et al., 2018; Rincón-Gallardo, 2012, 2015). *Tutoría* first originated

as an emergent model for secondary education in Mexican rural and isolated communities where only elementary school had been available (Cámara, 2003). In 2004, *Tutoría* model spun off to an NGO (at present called Redes de Tutoría), receiving support from some educational authority at the regional, state, or national level, in Mexico or outside (Cámara, et al., 2018). In 2009 - 2013, *Tutoría* became a national strategy to work with 9000 public schools. At this time, I spent a year (2011 – 2012) with the Mexican team working in rural telesecundarias in largely isolated and small communities across the country and then in further depth with the team in one state, Zacatecas. In 2015 - today in 2019, with the Consejo Nacional de Formento Educativo (CONAFE), the *Tutoría* system has been extended to enact this same ethic of dialogue and freedom in 33,000 rural communities across the country (Cámara, et al., 2018). Although support from the educational authorities has provided the entry point for the *Tutoría* model into the educational system, teachers, young people, and families have been the driving force behind the spread. *Tutoría* has been characterized as a social movement of educators who desire educational spaces that humanizes and uplifts the other (Rincón-Gallardo & Elmore, 2012). Counterhegemonic practices such as *Tutoría* have found a way into traditionally stagnant educational institutions also because of widespread frustrations about the failure of school systems and the necessity to try different approaches (Rincón-Gallardo, 2015). This is especially true at the margins, where the least advantaged students are served and where grassroots movements have long taken hold.

Returning from México to Singapore and Thailand, my colleagues and educators who heard about *Tutoría* in México, similarly wanted to build a similar kind of ethic in their schools. Because *Tutoría* necessarily adapts to the interests, history, and context of place, it was important for us to locally iterate, build and design *Tutoría* from sociopolitical context of movement actors (lands, teachers, students, families) at Sahasat. Sahasat is the third school in Thailand to take up *Tutoría* and the only Indigenous school to do so. While *Tutoría* has long operated within various Indigenous communities in Mexico (e.g. Nahuatl, Mazahuas, Tarahumara/Raramurí), together with teachers, young people, and families, we had to a unique opportunity to explore, adapt, and design *Tutoría* according to the political context of Indigenous education in Thailand. In this case, expanding *Tutoría* to consider lands and homelife as fundamental to our design at school and ultimately shift the purposes of school towards Indigenous and community futures in Thailand.

2.6.2 *Tutoría Pedagogy and Practice*⁷

7 Principles in Tutorial Relationships- Based on research in Mexico (Cámara, et al., 2018)

- 1) Matching interest with expertise
- 2) Growing and personalizing dialogue
- 3) Reflection
- 4) Openings
- 5) Community
- 6) Learning to Tutor
- 7) Academic exchanges

Principle 1: Matching interest with expertise

The *Tutoría* dialogue begins with the tutor trying to understand the needs and interests of the learner they are working with. With this understanding, they then offer or suggest to the learner a range (or one) possible “*Tema*” they have expertise in, that they have already studied and have within their repertoire of *Temas*. Examples of a *Tema* include the analysis of a poem or passage, unpacking division of fractions, cedar basket weaving with its stories, seeing global flows of produce and globalization, understanding the circuits and inner workings of a car engine, or studying food sovereignty practices. These *Temas* usually hold curricular connections.

Principle 2: Growing and Personalizing Dialogue

One of the most human and fundamental parts of the tutorial relationships is that each learning project is tailored to the tutor-learner’s history, culture, and family and community contexts. Learning is differentiated in a personalized dialogue, making sure each student reaches deeper levels of analysis, criticality, and understanding in their chosen *Tema*. In its best form, *Tutoría* is an act of joint, poetic co-creation of meaning (Shotter, 2010). The responsibility of “teaching” is distributed among the members of the classroom, making one-on-one attention possible in the classroom. This ensures each person can learn at their own pace and digests the first material before they move on to the next *Tema*. Once the tutor-learner are together, they are party to a fundamental *compromisio*, a commitment, that the tutor will foster the tutee’s agency to learn on their own (Cámara, 1999).

⁷ This is copied from a piece that I wrote with Miguel Morales Elox for Critical Praxis Newsletter (Meixi & Morales Elox, 2019)

Dialogue

Temas are explored through thoughtful questions that check, solidify, reaffirm, and build upon students' existing language, repertoires of practice for the play and practice of concepts and ideas with their tutor, a kind of guided participation and mutual co-sustaining an object of joint attention (Goffman, 1964; Barbara Rogoff, 1994). Using an array of pedagogical materials and relationships (e.g. textbooks, experiments, land, walking) to observe patterns, experiment, discover and understand highlighted concepts of that field or topic. This may come in the form of a learning activity or begin with a problem that scaffolds and structures the student's learning trajectory. The pair engages and continues the dialogue until the tutor determines that the learner has achieved the agreed-upon learning outcomes.

Learning based in dialogue opens up for a different kind of ethical treatment and ethical relationships in school spaces. Through dialogue, each *Tutoría* intentionally seeks to “flatten” top-down learning relationships into bidirectional personalizing ones. As the dialogue between two beings continues, they engage in a kind of ‘seeing together’ and learn to navigate various ways of thinking, ways of being, and ways of enacting values. Based on underlying belief that difference and heterogeneity is fundamental to building rich learning environments (Rosebery et al., 2010; Shotter, 2010), *Tutoría* holds space for learners to navigate worldviews so that new understandings emerge within and across cultural perspectives, social histories, time, and space (Habermas, 1981). Habermas (1981) posits that such subject-subject emancipatory communicative actions are the foundation for understanding ourselves and creating a more participative and democratic society and moral order – a foundationally different ethic from how we have designed for learning in public classrooms at a large scale.

Principle 3: Reflection

Reflection happens at multiple layers and levels. It happens throughout the dialogue and also is explicitly given priority and time after the tutoring. When the learning dialogue comes to a close, both tutors and learners need to reflect on their learning outcomes and learning process. This reflection can happen on two levels. First, learners are practiced into keeping a learning log or a “record” of their learning pathways. Learners are encouraged to pay particular attention to points of confusion as necessary parts of learning and deepening understandings. Second, the learner also reflects on the practice of tutoring. They think about how to teach that same *Tema* to someone else. There is deliberate self-reflection and critical inquiry.

Principle 4: Openings

After both the tutor and learner come to feel satisfied and feel they have achieved their learning goals, the learner then begins to look for areas within the *Tema* that they just learned to explore a tangential line of inquiry. These “openings” for learners as they move through the *Tema* could be sprouts for the learner to make the *Temas* their “own” and also for the subsequent development of *Temas* that can then be shared with the collective. They gain ownership and responsibility of not only their own learning but for the learning of their classmates and communities.

Principle 5: Community – Learning is stronger as it is shared

The first way that community is engaged is that the learner is expected to share what they have learned with others in the community of practice through a public presentation. At the end of the term¹, students usually come together for a public presentation or sharing of *Temas* completed during that term. This is an opportunity for the tutee to share what they learned with a larger learning community usually consisting of classmates and family members, sometimes including academic authorities or other visitors. A *Tema* is thus often “completed⁸” when the learner can present to others what they have learned. These presentations show the community how the learner 1) has extended the *Tema* to their own interests, 2) involves the larger school and family community in their examining and evaluation of their work, and 3) invites others who are interested in that *Tema* to learn that same topic with them. This is an important part in creating a shared learning experience in the classroom and establishing a culture of continual learning in community at school and beyond.

Community and Curriculum

Furthermore, in the Thailand context, home, cultural, and ecological knowledges are gaining importance in curricular design. Towards these ends, building relationships with community has been a particular focus of our work. We work with young people and their families to develop curriculum that allows for the navigation of multiple perspectives, knowledge systems, and worldviews (M. Bang & Medin, 2010). As our design was localized to place in Sahasat, we began basing our work building from Indigenous knowledge systems, cultural and ecological knowledge.

⁸ Mastery and completion are not seen as arrivals but kinds of good stopping points where both the tutor and learner feel satisfied with meeting the agreed upon goals of the *Tema*.

This included 1) designing and visiting students' home communities with teachers and school leaders, 2) co-developing *Temas* with students, teachers, and families based on important and significant cultural and familial practices, and 3) designing and doing presentations of learning in place with community members, and 4) involving family in our *Tutoría* learning community where parents also join in the tutoring and learning network.

Principle 6: Learning to Tutor

The responsibility of a learner to then become a tutor of that same *Tema* is a fundamental part of the commitment and expectation to further learning as a collective. Everyone in the network plays and shifts between the roles of learner and tutor. The expectation of every tutee is much greater; their role is not just to learn, but to learn well enough so that they can share and teach it to someone else. The collection of a learners' *Temas* is then stored in a personal catalogue that one may offer to anyone interested in learning it.

This shared responsibility to learn and teach recognizes the inner capacities of each child and actor within the network. Thus students take more pride in their work; for, the opportunity to teach is the best opportunity to learn and it also signifies acquiring a caring, solidary role within the practice community so that no one is left behind (Meixi, 2016). Teachers learn the *Tutoría* practice in the same way. They become students to tutors who have topics they want to learn and convert into tutors themselves after mastering the topic. In this way, all those who participate in the *Tutoría* network of learning gain expertise in both academic content and the practice of tutoring (López Salmorán & Rincón-Gallardo, 2003).

Principle 7: Academic Exchanges

Tutoría is intentional about making sure learning continues across place, and in particular beyond just school. This has taken various forms – exchanges between families and students, learning journeys to visit other schools who also work in *Tutoría*, organizing regional festivals of learning so that a collection of schools come together to extend and refine their practice. For many, bringing the practice across space continues to motivate teachers and students in the practice. These academic exchanges are real opportunities to first, spread and strengthen the students as tutors, share values through it and feel part of a larger movement as we build a community of learners who are united by the practice of *Tutoría*.

Article 1

Chapter 3. STORYWORK OF SCHOOL: GROWING HETEROGLOSSIA IN DESIGN

3.1 INTRODUCTION

But there were many things that I got from students here, that is, that when we come to Sahasat, it means we are Sahasat teachers. One thing that I don't like it at all – whoever says that Sahasat is bad, the teachers are not good, the students are stupid. So even if it's small small little little things that our students can do, like, sometimes the teachers may see or may not see it, but whoever notices it like – when the students go compete or do, whatever is good and the result is good, it can be their studying or their behavior. We also see that it is good, we feel good. When we go somewhere, even if the little admiration isn't from the majority, we feel good. I feel, feel that our school is coming to be stronger. - Kru Noon (Academic Head, Sahasat)

Kru Noom, the academic head at Sahasat, an urban Indigenous⁹ school in Thailand, shares that how we notice the “small small little little things that our students can do” can illuminate pathways building different possible worlds, especially the worlds of school. How we notice and story everyday moments matter for taking seriously Indigenous children’s sensibilities, diverse interests and full lives. This often goes against homogenizing structures of compulsory state education in Thailand (Kwanchewan & Prasit, 2009). Moreover, Kru Noon adds that schooling as a dehumanizing space is *felt* by students and teachers at Sahasat. This paper explores how in schools, re-sto(y)ing and designing for learning in microinteractional ways can have profound implications for destabilizing educational hegemonies (Bang & Vossoughi, 2016; Sengupta-Irving, Redman, & Enyedy, 2013; Marin & Bang, 2015). The field of the learning sciences has long been concerned with sensitizing us with new eyes to make visible the dynamic and diverse ways human people learn and make meaning as the first lever towards social change making (Bang et al., 2012; Cole & Griffin, 1983; Engeström, 2011; Gutiérrez & Rogoff, 2003; Lee, 2001; Nasir et al., 2006; Rogoff, 2003; Rosebery et al., 2010). This paper attunes to the ways that stories and storywork

⁹ I use the term Indigenous people in Thailand to mirror the movements and efforts of self-identifying Indigenous peoples in Thailand (Prasit, 2019; Prasit, McCaskill, & Kwanchewan, 2008). I explain the history of this term in the introduction of the dissertation.

with educators can re-organize power (Archibald, 2008, Archibald, Nicol, & Yovanovich, 2019; Bang et al., 2014; Barajas-López & Bang, 2018a; Marin & Bang, 2015; Sengupta-Irving, Redman, & Enyedy, 2013) and contribute to the learning and becoming of diverse collectives.

Over three years, I explore what emerges when teachers, researchers, students, their families and I intentionally worked to disrupt powered constructions of teaching and learning through a practice called *Tutoría* in Sahasat. *Tutoría* refers to a pedagogical system that began intervening in the instructional practices of Mexican public schools to transform settled hierarchies of control in teaching and learning, towards more horizontal, humanizing relationships of dialogue, respect, and reciprocal learning (Cámara, 2003; Cámara, et al., 2018; Meixi & Morales Elox, 2019; Rincón-Gallardo, 2015). Deeply aligning with work in the learning sciences, *Tutoría* is driven by a fundamental belief that consensual dialogue can transform intersubjective relationships – the relationships between and among students, teachers, and families – and can make visible the interests, creativity, and expertise of children (Brown, 1992; Brown & Campione, 1998; Gutiérrez, 2008; Lee, 2001; Nasir, 2002; Nasir, Rosebery, Warren, & Lee, 2006; Bang, Warren, Rosebery, & Medin, 2012). Since 2013, I, alongside a team in Thailand began building a similar *Tutoría* network in Thailand. This started both at both the request of Thai educators, as well as my own interests to work with highland Indigenous communities given that I too spent time as a child learning and spending time with the Lahu tribe in northern Thailand.

Tutoría shifts dominant relations of power this way: In a *Tutoría* community of learners (Brown & Campione, 1998), students choose a line of inquiry of their interest from a catalogue of topics that someone else is offering and has developing expertise in. Through guided participation and joint co-creation of emergent meanings (Rogoff, 2003), tutors and learners engage in dialogue based in consent, respect, and reciprocity (Cámara, 2003; Cámara, et al., 2018). With an object of joint attention (e.g. a text or a math problem), the tutor identifies and leverages what the student already knows, pointing out relevant information within the sources being reviewed, introducing new forms, perspectives, and questions for learners begin to form their own ideas and perspectives. Students then demonstrate publicly what and how they learn to the group, and often to parents and the larger community. Once a student develops expertise in that same topic, they then have the responsibility to offer and teach what they have learned to others and contribute to the intellectual health of school. Thus, in a *Tutoría* community of learners, the role of tutor and learner are in constant flux as learning is shared across people and place. Who teaches and learns is determined

by interest and expertise, not by the formal roles assigned in school. Sometimes adults serve as tutors of students, and students tutor their peers and even adults. People move through and across the network to share teaching and learning across schools and communities.

I have been visiting Sahasat since I was 12, a school that most of my Lahu friends went to growing up. The invitation to design at Sahasat school was thus particularly special for me and my family. In this paper, I was interested in asking: How Tutoría taken up by the teachers at Sahasat over our three years together? I write this paper from stories and felt theories of teachers at Sahasat – their everyday affective theories, embodied knowledges, narratives practices and experiences – to explore how they storied the changes that we were trying to reach for and how their stories shifted over time (Million, 2008, 2011).

3.1.1 *Tutoría and the Sahasat Context*

Historically, schooling in this context has otherwise been complicit in “selective integration” since the Cold War (Keyes, 1991; Kwanchewan & Prasit, 2009; Vaddhanaphuti, 2005) and constructing narratives that erase and devalue family and community life (Keyes, 2008; Keyes, 1991; Kwanchewan & Prasit, 2009; Vaddhanaphuti, 2005). From dominant perspectives, growing cultural-linguistic heterogeneity can be perceived as a threat to national security and nationhood (Keyes, 1991; Laungaramsri, 2003). In this paper, I suggest that transforming the relational qualities of teaching and learning mattered in the context of Indigenous education in Thailand. It not only destabilized hegemonic Thai nation-building and modernization initiatives that are predicated on cultural homogenization for “Thai-ness” (ความเป็นไทย) and but also for who students and families imagined they could be. Tutoría’s insistence on taking seriously young people’s full lives meant that our design needed to be pushed to further align with their lands and homes. This paper traces the trajectory of our design across two time points – at the beginning of our time together as a team of teachers in February 2015 and then again in December 2017 as Tutoría was expanded within and across lands, in particular knowing and learning young people’s respective homelands and villages.

Sahasat school is a private welfare school (โรงเรียนเอกชนการกุศลประเภทการศึกษาสงเคราะห์) located in Chiang Rai city with a student population of about 2600 young people and 100 teachers. At from Primary 1- Secondary 3 (Grades 1-9) classes sizes average 40 -50 students a class and this drops slightly to 35-40 students a class in Secondary 4-6 (Grades 10-12). Sahasat’s

students come from 13 different ethnic groups and tribes: Akha, Lahu, Karen, Hmong, Lisu, Yao, Chan, Thailue, Lawa, Chinese, Khmu, Plang, and Northern Thai, from around 300 different villages across Chiang Rai province. Driven by a nexus of non-profit groups, family decisions, and also lack of post-primary education in the villages, there is a steady trend of young people coming to the city to continue on to secondary education and leaving home and family life for nine months out of the year. This is often fueled by narratives of modernity and development in central city life and a “superior present” (Kwanchewan & Prasit, 2009; Thongchai, 2000b). At Sahasat, 57% of students from Primary 1 to Secondary 6 (Grades 1-12) reside in 59 different youth hostels or rental units, away from their families and communities (Sahasat, personal communication)¹⁰. Students often return home once, if not twice a year to their families. Fragmentation of school and home life is prolonged, desirable, and even encouraged. Conversely, for Indigenous young people, connection to land and family often not emphasized as the focus is access and participation in dominant Thai society.

The goal of our¹¹ participatory design research design was to intervene in powered expertise relations in teaching and learning at Tutoría (Bang & Vossoughi, 2016). This started out focused on transforming subject-subject-object relations, where relationality across teachers and students, school and home as the domain of transformation itself (Bang et al., 2015; Bang & Vossoughi, 2016). This goal then expanded to interrogate other forms of powered relations in the course of our time together which also had implications for how teachers problematized settled knowledge hierarchies reflective of colonial narratives and agendas in public schooling. Because our design was enacted alongside teachers, I explore how teachers were making sense of our design at two points: at its inception in February 2015 and almost three years later in December 2017.

3.1.2 *Research Questions*

In tracing our stories of school over time, I follow two sets of 17 teacher stories across three years to examine how storywork – the storytelling and story listening with each other – educated our hearts, minds, and spirits (Archibald, 2008). Dian Million (2014) writes that “[Stories] are a felt

¹⁰ By grade categories, Kindergarten – 12% of children lives away from their families, Primary 1-3, that increases to 53%, in Primary 4-6, 57% of students away from their families, Secondary 1-3 - 57%, Secondary 4-6 - 58%.

¹¹ I use “our” when describing the ongoing work at Tutoría to acknowledges how it was collectively enacted by the leadership at Sahasat, especially Amornrat Pinwanna and the Tutoría team. This work is also co-led with Alison Ling, Sukanda Kongkaew and Panthiwa Theechumpa, Transformative research is cannot be done alone.

knowledge that accumulates and becomes a force that empowers stories that are otherwise separate to become a focus, a potential for movement” (p. 31-32). Through bringing “otherwise separate” stories of teachers together as they work across the landscapes of home and school, I ask: *How and in what ways did the politics and ethics of our participatory design research shift over time through stories?*

Specifically,

1. What sensibilities and potentials for movements emerged in teachers’ stories?
2. How did they shift across these two storywork events at Sahasat school?

Storywork events here refer to events where teachers story-told and story-listened together (Archibald, 2008; Archibald, Lee-Morgan, & De Santolo, 2019). I was interested in how (re)storying the sways we are in relation with one another in teaching and learning might have ethical and political implications, creating the potential for collective movement at school. Through teacher stories and reflective sense-making of our collective work, I hope to honor the everyday experiences and stories of people, in particular how the stories of those closest to the work reflected our designs and also how our designs shifted through story and restor(y)ing practices and relations within Sahasat school (Bang et al., 2014; Sengupta-Irving & Enyedy, 2015).

3.1.3 *Colonized relations in schooling & Potential for Different Possibilities*

These teacher stories live within a variety of sociopolitical entanglements of power at school (Nespor, 1997). Teachers are often unaware agents of the nation-state (Jukping, 2008). They grapple with pedagogical choices in the face of constant demands of the nation-state and global agendas and yet can be the ones to imagine new possibilities for the purposes of school (Robertson, 2012). On one hand, we know that Indigenous presence and resurgence have always challenged the hegemony of school (M. Bang, 2009; M. Bang et al., 2012; Corntassel, 2012; Davis, 2013; Prasit & Meixi, 2018; Villegas, Neugebauer, & Venegas, 2008; Vizenor, 2008). At the same time, reform attempts to humanize education (Esmonde & Booker, 2016; Lee, 2008; Nasir et al., 2006) run directly against powerful forces that continue to uphold colonial, neoliberal, and capitalistic agendas that require the assimilation of children to a singular set of criteria (Cole, 2012; Simpson, 2014; Tabulawa, 2003; Tatto & Plank, 2007).

In schools, dehumanization and ongoing colonization is a historical and present-day reality (Brock-Utne, 2000; Freire, 1970; Keyes, 1991; Olson, 2009). In the context of Thai national education policies and global education reforms, colonized relations in schooling operates at various scales – it is ideological, structural, and socially constructed in moment-to-moment interactions, in how teachers hear, talk, and treat students’ ideas and cultural practices (Bang & Vossoughi, 2016; Erickson, 2004; Lee, 2012; Shah & Leonardo, 2016; Vossoughi & Booker, 2017). This is further complicated by global education reforms where teacher practices, tools, materials, curricular content, standardized testing, and Eurocentric knowledge systems are based in colonial logics of modernity and discourses that controls difference (Illich, 1971; Mignolo, 2007; Paine & Zeichner, 2012; Tabulawa, 2003; Tatto, 2006; Tatto & Plank, 2007). These continue to limit forms of participate in teaching and learning and controls the bounds of permissible sense-making (Bang et al., 2013; Rogoff, 2003).

Powered hierarchies in teaching-learnings relationships where knowledge is reduced to one person or one state-sanctioned curricular source are everyday assaults on Indigenous communities’ knowledge systems and lifeways (M. Bang et al., 2012; Brock-Utne, 2000b; Kwanchewan & Prasit, 2009; Marker, 2006; L. B. Simpson, 2014). Homogeneity, individualistic competition, the placelessness of learning, and the separation of schools from homeland knowledges, are dissonant with Indigenous ways of knowing and being (Bang et al., 2012; Cámara, 2003; Marker, 2006; Pelletier, 1969; Rincón-Gallardo & Elmore, 2012; Rogoff, 2003). This is a kind of “cognitive imperialism” and “epistemic violence” that separates and discredits nondominant forms of knowing while validating Eurocentric knowledge are often based in capitalist ideologies and settler logics (Battiste, 1998; Marker, 2006; Meyer & Benavot, 2013; Tabulawa, 2003). As arms of the colonial state, schools are funded and purposed to further nation-states’ economic and political agendas. They are designed for extractive-assimilative ends – extraction towards capitalistic production, and cultural assimilation into dominant ways of being that try to sever relationships to land and disregard the richness of family and community life (Bang et al., 2012; Battiste, 1986; Klein & Simpson, 2017; Lee, 2001; Nasir et al., 2006; Rogoff, 2003; Rosebery et al., 2010; Simpson, 2014). These agendas often take precedent, rather than ones that ensure the flourishing and collective continuance of families and communities (Whyte, 2014, 2017).

However, hegemonic relations of power are also never foreclosed; they can be undone in interaction by living and enacting possible new worlds, and I would add, through story (Tsing,

2005; Vakil, Royston, Nasir, & Kirshner, 2016; Vossoughi & Booker, 2017). Despite the encroachment of systems of schooling on family life, Indigenous communities have always ensured and strengthened their own aptitude for being adaptive in ways sufficient for the livelihoods of its members to flourish into the future” (Whyte, 2014, p. 602). This work at Sahasat was part of ongoing work in school to try to uphold that.

3.1.4 *Our Design Trajectory*

Over three years, our design shifted and iterated based on the interests and needs of the design group. In Year One, we focused on (1) consistently practicing Tutoría with students and each other at Sahasat and (2) shifting school structures such as timetables and creating teacher-student leadership teams to create the conditions by which Tutoría could flourish (See Appendix A for list of design sessions).

Our second year continued to refine our practices from within the Tutoría dialogues and expanding the Tema designs work with students and teachers. In December 2017, our design shifted significantly, when we began following six young people across the landscapes of homes and school.

In Year Three (May 2017), we physically moved across the landscapes of home and school and began walking lands with the six young people’s families as part of our design (See Article 2). An increased attention to homelands then prompted the design of a two-day session with these six young people who were designing Temas with their homelands (See Article 3). In this session, these same six students worked with their families to design a Tema based on an important family practice. Six teacher then paired up with a student and learned with this home-based Tema. Year Three represented a shift from just focused on dialoguing in Tutoría to designing with important land-based family practices on students’ respective homelands.

The stories from this paper come from year one and year three during two storywork events that I will detail later in the paper. This paper joins a growing body of literature in the learning sciences that sees narrative and storytelling as central ideas to learning, development, and the expansion of possible futures (Buenrostro & Radinsky, 2019; Marin & Bang, 2018; Nuñez-Janes, Thornburg, & Booker, 2017; Sengupta-Irving et al., 2013; Tzou et al., 2019). It further theorizes the role of stories in teacher education (Archibald et al., 2019; Bang et al., 2014; Barajas-López & Bang, 2018b; Marin & Bang, 2015; Sengupta-Irving et al., 2013) and underscores its relational

implications in creating and carrying diverse collectives in schools that have the potential to shift the purposes of school towards family and community ends, that ultimately destabilize educational hegemonies.

3.2 THEORETICAL FRAMEWORK

I begin with the assumption that learning is always cultural & historical, entangled with power, and always carries political and ethical implications, and embedded in stories. I draw from two main theoretical orientations - Sociocultural perspectives in learning & Storywork. First, from sociocultural perspectives, macrolevel systems filter down and impacted by microlevel interactions. Colonized relations in school are as much ideological, structural, and political, as they are interactional (Lee, 2012). Relationships of power and hegemony are socially constructed in moment-to-moment ways and play out in the ways that teachers hear, talk, see, and treat students' ideas, cultural practices, and home lives (Erickson, 2004). Second, as people participate and make meaning across settings, we learn and carry stories with us – the theories about how to be in the world (Bang et al., 2014; Brayboy, 2005). Drawing on these two frameworks, this paper makes visible how we are in story with each other matters for repairing, humanizing, and re-mediating their worlds of school.

3.2.1 *Sociocultural perspectives on Learning & Design*

I situate this work within sociocultural perspectives on learning and development that takes as its foundational premise that all learning is a situated, historical, and cultural. People shape and explore, and make sense of their worlds in ways that are dynamically tied to constellations of relationships, practices, values, goals, identities and worldviews of individuals and their communities (Bang et al., 2013; Cole, 1989; Gutiérrez & Rogoff, 2003; Lee, 2008). Learning and routine human activity are thus fundamentally tied to social reproduction and social change. Through heterogeneous meaning-making practices come into contact with one another to “generate new understandings, extend navigational possibilities, and adapt meaning-making practices to new forms and functions” (Rosebery, Ogonowski, DiSchino, & Warren, 2010, p. 324).

3.2.1.1 Heteroglossia

Foundational to learning from this perspective is heterogeneity or heteroglossia (Rosebery et al., 2010). Bakhtin's (1981; 1984) concept of heteroglossia describes a condition of everyday life that understands the social world as made up of a polyvocal voices and perspectives – what Bakhtin calls a multiplicity of languages (Rosebery et al., 2010). Languages here encompasses specific points of view in the world, how one conceptualizes, represents and evaluates the world (Bakhtin, 1981). Heteroglossia exists among a multitude of forms – from the utterance to gesture, to institutional structures that are inherently linked to class, race, gender, ability and fundamental conceptions of the diversity of life. There are two co-occurring forces that operate alongside each other to expand and limit heteroglossia – centripetal forces and centrifugal forces (Bakhtin, 1981).

Centripetal forces are centralizing forces that “serve to unify and centralize the verbal-ideological world” (Bakhtin, 1981, p. 343). Their centralizing tendencies try to limit the realities of everyday heteroglossia to enclose the kinds of speech and language forms in dialogue and interaction (*ibid*). At the same time, centrifugal forces continue the process of “decentralization and disunification” (*ibid*, p. 344). Conversely, because each utterance is always emplaced in time and space, it exists within a particular history and system of relationships; utterances are never foreclosed. As Bakhtin says, (1984), “The world is open and free, everything is still in the future and will always be in the future” (p. 166). These centrifuging tendencies thus continue to widen and deepen the multiplicity of languages, perspectives, speeches and genres – maintaining heteroglossia as long as speech and language is alive. In this sense, noticing and attending to heteroglossia allows for dialogue, meaning, and social interaction to expand possible ways of sense-making across languages.

Even though healthy heteroglossia is a condition of the everyday, schools and classrooms designed towards empire building has often denied the fundamental heteroglossia of life through restricting the kinds of utterances – and hence the everyday languages – that are used in school spaces (Rosebery et al., 2010). I suggest that schools operate akin to a kind of macro-level centripetal force that restricts how teachers respond and attune to the multivoiced perspectives, interests, values, languages that keep us and our communities alive. At the same time however, telling and listening to the diverse stories of students, teachers, and families is a similar then to everyday centrifugal forces to keep expanding and orienting towards multiple possible futures.

3.2.1.2 Heteroglossia and Axiological innovations

Heteroglossia and the centripetal and centrifugal forces that limit or expand it carry axiologies dimensions; they are value-laden. Axiologies refer to what one values as ethical, true, and beautiful (Bang, Faber, Gurneau, Marin, & Soto, 2015). Within worlds of social heteroglossia, Lemke (2002) posits that how we make sense of texts is value-laden and contains particular axiological stances “towards itself and other voices” (p. 39). Lemke (2002) writes, “Every social voice within the heteroglossic whole is positioned in relation to every other not solely in terms of its thematic and rhetorical-generic uses of language, but also in terms of its axiological use of language” (p. 39). By extension, the ways that we make meaning of texts and interactions are always in relation to other texts, in relation to ourselves, and in relation to our systems of relations – what we value, and hold to be true and beautiful.

At the same time, “social heteroglossia ensures that members of social groups with opposed interests will rarely agree in any of these respects” (Lemke, 2002, p. 53). How we view others’ moral and ethical judgment, “depends on the match or mismatch of our axiological stances and theirs” (ibid). Hegemonic forces common in state-driven schooling are often axiological mismatches with Indigenous and nondominant communities. As such axiologies are ubiquitous and routine parts of human interaction, inherently linked to power and politics, (Bang et al., 2015; Vossoughi, Jackson, Bang, Warren, & Rosebery, 2018). I suggest that the stories and storywork of teachers carried implications for teachers axiological positionings “of self and others with respect to knowledge, knowing”, they are openings “in the conceptual, emotional and affective states that shape inter-subjectivities and possible futures in interaction” (Bang et al, 2015, p. 2).

Our design with Tutoría was reaching for axiological innovations in what we assume to be “good, right, true and beautiful” at school (Bang et al, 2015). Tutoría interrogates what we considered to be beautiful and true in nation-state schooling in Thailand in hopes of cultivating learning environments that support “axiological heteroglossia toward decolonial, just, and sustainable futures” (Bang et al., 2015, p. 2). For example, instead of homogeneity, we proposed a design based on distinct axiologies that expands heteroglossia at school. On one level, Tutoría is positioning children as intellectual beings with deep expertise, pedagogical styles, and important knowledges. Tutoría apprentices teachers into noticing, building upon, and expanding the languages and voices that were permissible in school – towards conditions of everyday healthy heteroglossia. On another level, as teachers worked with students in Tutoría, it seems that these

re-positioned teacher-student relations of power also had implications for how teachers understood themselves in relation to knowledge and knowing, in ways that mattered to them. I posit that such transformed subject-subject-object relations through storywork also created space for teachers to expand their collective imaginations of schooling and the ethical and political possibilities that they enacted in our design. Given the tightening centralizing tendencies in Indigenous education in Thailand that are further complicated by global narratives of modernity, a re-mediation of teaching and learning relationships holds space for divergent, heterogeneous meaning-making processes to come into contact with each other. It refuses the normative centralizing forces of school. This paper mirrors that ethic by making visible the heteroglossic ways teachers storied this work over time.

3.2.2 *Stories and Storywork*

Stories have also been a dimension of previous work in the learning sciences concerned with learning, becoming, and the positionings of self in relation to others (Bruner, 1990; Heath, 1983; Ochs & Capps, 1996; Rymes & Wortham, 2011; Wortham, 2001b). Within Indigenous education, stories are key to remembering and advancing Indigenous knowledge systems towards pathways of decolonization (Archibald et al., 2019; Bang et al., 2014; Barajas-López & Bang, 2018b; Marin & Bang, 2015). Bang et al. (2014)'s work on re-stor(y)ing lands illustrates the importance of story in pathways of becoming, and how they help “move toward Indigenous identity and possibility” (p.14). Building upon such prior scholarship, I am interested in how human people and communities become environments for each other's learning through story and storywork; how they keep and hold each other to make social dreaming – the joint orientation to a pursuit of new horizons possible (Espinoza, 2008).

I center this paper in teacher stories because they reflect who we interpret we are and emerge out of our everydayness (Million, 2014). In this way, “Story has always been practical, strategic and restorative” (Million, 2011, p. 322). Stories can help theorize and build collective movements that refuse colonial paradigms (Archibald, 2008; Bang et al., 2014; Brayboy, 2005; Million, 2014; Zavala, 2016). Within Indigenous methodologies, stories are theories, meanings, and methods (Brayboy & Maughan, 2009; Kovach, 2009). Within the Sahasat context, where part of theoretical and methodological foundations of this research engages with practices from within Indigenous knowledge systems; thus stories and storywork are central to that.

3.2.2.1 Stories and Heteroglossia

Storywork both holds heteroglossia and a collective because it involves dynamically “go(ing) into the story” to awaken imaginations to educate the heart, mind, and spirit (Archibald, 2008, p. 134). As we go into the stories of each other, we experience and understand more deeply the basic content of the story and its teachings for our own lives (Archibald, 2008). The teachings for each person is different, and different with time (Fernandes, n.d.). Kovach (2009) also reminds us that “stories are never decontextualized from the teller and are recounted relationally. They tie us with our past and provide a basis for continuity for future generations.” Telling stories with each other builds our collective “power to make one think, feel, and reflect on one's actions” (Archibald, 2008, p. 81; Archibald et al., 2019). At the same time, storywork— the storytelling and storylistening – helps close the distance between the other as we come to interrelate with story and one another. Through storywork, justice is not a lofty ideal but a mode for relating, a practice for teaching and learning, a way of life.

Storywork became a routine part of our design at Sahasat on three levels. Storywork at Sahsat involves (1) being in Tutoría together with students and other teachers, (2) telling each other stories of how we came to be during design meetings, meals, and walks together, and (3) storying our collective work as research methodology. These stories held a multiplicity of teachings about identity and relations to place. They were part of growing understandings about our emerging roles and responsibilities as teachers in school with families and communities. This paper draws on storywork event during two design sessions where teachers came together to tell and listen to each other’s personal and collective narratives of the work. It examines how through story, multiple sensibilities in teaching and learning emerged, shifted and stayed the same over time.

As a methodology, storywork repositions otherwise colonial power paradigms between Indigenous research methodologies and Western ones in ways that are generative and based in hope (Archibald et al., 2019). Collective analysis and writing of this research was a kind of storywork that called me back to collective relationships and responsibilities to our group. As I gathered stories with teachers, storywork was also done in me. I am learning to resist re-inscribing normative powered hierarchies of a single story of research, written and told from the domain of a researcher (Adichie, 2009). Instead I try to purposefully live out heteroglossia in this data analysis and writing of this paper. I engaged in collective analysis and the telling of multiple stories to illustrate the many ways teachers took up the design in ways that were resonant to

them (See methods section). Chimamanda Ngozi Adichie (2009) says “Stories matter. Many stories matter. Stories have been used to dispossess and to malign, but stories can also be used to empower and to humanize. Stories can break the dignity of a people, but stories can also repair that broken dignity” (Adichie, 2009). Through telling a range of stories, we tried to move closer towards a world of hope, of heterogeneity, and collective continuance (Whyte, 2014, 2017, 2018) of the many families and communities we come from and care about.

Rice has a special relationship with water. In all its varieties and forms needs water to grow and be cooked. Rice celebrates water, and water celebrates rice. In turn rice paddies are created wetlands that serve as breeding grounds, shelters, and feeding sites for wildlife, fish, insects, snakes and others. Stories are like the water that support rice – the heterogeneous forms of rice to thrive and grow.

3.3 METHODS

This dissertation is meant to be an act of reciprocity. It grows out of a 18 year-long relationship with Sahasat School where I used to spend time as a child. It tells stories of how teachers, young people, families, and researchers worked to tell new stories, collective stories. As teachers told stories to each other, stories did a work in them. Now listening to the teachers’ stories again for this research continued to do a work in me.

3.3.1 Storywork and Relational accountability as methodology

Relational accountability discusses the importance of ethics in research (Wilson, 2009). The same code of ethics that govern our relationships with each other and lands, should also guide our research (Smith, 2012). From Indigenous paradigms, research has always been rooted in and guided by relationships (Archibald et al., 2019; Bang et al., 2014; Bang & Vossoughi, 2016; Brayboy, Gough, Leonard, Solyom, & Roehl, 2011; Kovach, 2009; Smith, 2012). Relational accountability is based on assumptions that knowledge is shared and it is the *relationships* that hold the ideas together (Wilson, 2009). Instead of seeing knowledge as gained or owned by just an individual, an Indigenous paradigm in research “comes from the fundamental belief that knowledge is relational. Knowledge is shared with all creation” (Wilson, 2009, p. 176). The four Rs in Critical Indigenous Research Methodologies – relationality, reciprocity, respect and responsibility are fundamental values and axiologies that guide how we should engage in design, research, and analysis that (re)claim Indigenous lifeways for young people and communities (Brayboy, et al, 2011).

Guided by these four Rs, we engaged in storywork and collective analysis as two relational accountability methods. Methods here refer to the tools and practices for data collection and analysis that reflect methodologies, that is, the philosophies and theories of the work (Brayboy et al., 2011). First, storywork as method with teachers (native and non-native at Sahasat) was a way to “story-talk, story-listen, story-learn, and story-teach...and to understand our stories with respect, reverence, reciprocity, and responsibility” (Archibald et al., 2019, p. 7). Storywork was an important practice for us to renew our responsibilities to Indigenous young people and community futures at school. Second, we also engaged in collective analysis as a method to code data and select codes together as part of our practices and relationships. There are multiple practices, tools, and strategies to enact relational accountability as method, and such methodologies are meant to be openings for heteroglossia. I discuss these two methods in more detail below. While our research has not yet been based in and driven by community members, this paper offers a way in which relational accountable methodologies could be imagined and practiced within Indigenous research paradigms in school spaces.

3.3.2 *Relational Accountability in Participatory Design Research*

I suggest that Tutoría is a kind of participatory design as we were fundamentally interested in relationality as the object of transformation in the process of partnering. Bang & Vossoughi (2016) characterize participatory design research as concerned with how critical historicity, power, and relational dynamics “shape processes of partnering” that refuse normative structures of power and also social change-making in the here and now (p. 174). Through multidimensional role re-mediations that see design activity as endogenous to everyday activity, participatory design research complicates static roles of “researcher”, “designer”, “teacher” for more porous roles in design and data analysis (ibid). Enacting relational accountability in our design across student-teacher-family-researcher towards critical reflexivity, heterogeneity and transformative agency over time so that we could better critique normative structures like epistemic homogeneity while also creating new forms of relationality for collective social change-making at Sahasat (Bang & Vossoughi, 2016).

3.3.3 *The Design Team*

The design team began with myself, Alison, Sukanda, Panthiwa, and Suraj who were began piloting and supporting the introduction and growth of Tutoría at Sahasat. When we began this work in 2015, Alison and I have long-standing relationships with Sahasat in smaller-scale projects for the past 15 years. Sukanda was a new team member and had been part of the Tutoría networked community of practice for about a year. Alison and I personally spent many summers at Sahasat running in the field or attending class with my friends from the Lahu tribe but we had never formally engaged in an ongoing, multi-year program at Sahasat prior to this. This initial team met with the academic head, Ajarn Noon, three times before she decided to organize the Tutoría camp with us. Thus, when she invited us to design a pilot camp to see if the teacher and students took to, and were interested in using Tutoría at school, this was particularly significant for all of us.

Tutoría necessarily involves everyone – students, teachers, families, and researchers in the network as part of the design team in porous roles and designers in different capacities and at multiple levels (teaching, design, analysis) (Bang & Vossoughi, 2016). As a result, we can say that over the course of our time together, the external Tutoría team, teachers, and school leadership became friends and family. We had many dinners together, we danced together at the local night market, we harvested lettuce at one of the teachers' village together, we stayed at the academic head's house, and would keep up with teachers' health, and life experiences of pains, and joys. While we only see a glimpse of these teachers and their lives featured in this paper, these stories are part of larger ongoing histories and relationships. At the core, relational accountability as method asks: how do these methods come from, honor, and further these relations? Specifically, the story analysis methods employed here attempts to find practices to do this.

3.3.4 *Gathering Stories at Storywork Events*

Throwing a string and making a SHS Tutoría web: this makes me impressed that working is teamwork, it's not working alone. About the memorable moments, there were so many things, but what I see that it's a point that is good is that we have been together.

โยงเชือกสายใยแห่งทิวทอเรีย ครูสหศาสตร์ เพราะทำให้ประทับใจถึงว่าการทำงานนั้น คือทีมคณะมิใช่ทำเพียงลำพัง อาศัยจุดของเรื่องราวที่เราจำ ก็มีเยอะมีเยอะมากแต่ที่ฉันเห็นว่าเป็นจุดที่ดีอย่างหนึ่งก็คือการที่เราได้อยู่ร่วมกัน ทุกคนได้ใช้เต็มมาได้สอนแล้วเราก็นั่งคุยกันเป็นวงกลม

เหมือนกับเป็นการแชร์แล้วก็เป็นการที่เราได้ให้ความคิด บางทีอาจไม่จำเป็นต้องให้ความคิด แต่เป็นการให้กำลังใจมันก็สามารถใช้ในหลายๆกรณีได้นะครับ

Kru Chuti looking back on the 2015 Storywork Event I

Desire-based research engages a fundamental transformation of how stories are reported, taken up and used in communities and to what ends (Tuck, 2009). In contrast, damage-based research often creates master narratives that participate in the ongoing colonization of people. Heteroglossia (Bakhtin, 1984) was thus a way to create some data collection practices and analytical tools by which to understand the multiplicity of stories that teachers were sharing with me and each other. Furthermore, Kovah (2009) reminds that “stories were the vessels for passing along teachings, medicines, and practices that can assist members of the collective” (p. 95) – we didn’t just transform the stories that were told, but were trying to understand the power of stories in the transformation of ourselves and our relationships to each other.

3.3.5 *Storywork Events*

In February 2015, we began with 20 teachers and saw some teachers leave or retire the school before December 2015. In total we have stories from 16 teachers and the school academic head (N = 17) that have been at both storytelling points.

Storywork Event 1 (February 2015). Storywork Event I was embedded within a two-day Tutoría camp¹² in February 2015. The purpose of the camp to have teachers and students experience the face-to-face dialogue in Tutoría and then practice designing a lesson that they might use in the Tutoría learning system. At the end of camp, a team of 20 teachers were to decide if they wanted to collectivize and build out the practice in their classrooms. Our design team (myself, Sukanda, Suraj and Alison¹³) worked with the academic head to plan and invite teachers to join the camp.

¹² The camp was organized in four main sessions that built upon each other. The cycles are as follows: Session 1 of the camp, was organized in four rounds that built upon each other where individuals would master a *Tema*, and then be responsible for sharing it with another group that was added to the camp. In Round 1, teachers learned a *Tema* from various students in CVK and then designed their own *Tema*, based on their subject of interest with an eye toward topics common to the Thai national curriculum. In Round 2, these teachers would tutor students that they invited to the camp and then work with them to become a tutor of that same *Tema* to a new group of students in Round 3. In this way, the cycles of participation iterated upon each other and shifted relations of power as the groups converted from learner to teacher at the end of each cycle. For a full description of the two-day Tutoría camp program, please see Appendix B.

¹³ Panthiwa joined the team a year later in March 2016.

It was critical that participation in the Tutoría Camp was voluntary and fundamentally based on consent. An open invitation was given to all 80 teachers at Sahasat and from those interested teachers, the academic head chose 20 of them to form the first group of teachers across a variety of disciplines and teaching experience to begin and co-design the Tutoría network. These teachers too, then selected two of their own students each join the camp.

Data from storywork event I comes from last session of the Tutoría. This session was called the Web of Passions¹⁴ where we (design team and teachers) stood in a circle with a ball of string. In the circle, each person told stories of how and why we came to be educators and if the Tutoría system of learning aligned with their visions of change. The prompt to teachers was: *Share with us your passion for education and how that fits with Tutoría. After you are done sharing, you will throw the ball of string to another person and this is the expression of your commitment to the work.*

When one person was done sharing, they held onto one end of the string and threw ball on the other end to the next storyteller in the circle. With each new story, the string that was passed around creating a kind of web of interconnection, intersecting relations, connected by their visions for education, a web of passion (See Image 1).

Image 1. Picture of our team in February 2015 at the end of the Web of Passion



Storywork Event 2 (December 2017). The second point in time that these teacher stories come was over a teacher lunch in December 2017. After almost 3 years of working together, I had to begin figuring out the story to tell in my dissertation. The more I thought about our work together, the more I felt that this was not solely my story to tell. Both feeling that this work and research was not “mine” and at a loss of where to begin telling these stories that we collected on our journey, I went back to the teachers, young people, and their families to ask them what stories we should tell of this work together and what they wanted to share about our work together.

That afternoon, there were 10 teachers and the academic head present to tell stories. With the teachers, we engaged with a similar process as storywork event 1. We were sitting in a circle over steamed fish, veggies, and rice and where each person took turns to share out stories of the work that we important to them. We began the session by sharing some of the youth stories that we had heard earlier in the day about which three moments and stories were important to the young people. Teachers responded to the following prompts:

1. What was a tense moment that your beliefs were challenged?
2. In our time together, what is a moment that you’ll always remember?
3. What was an important or special moment for you?
4. What is the story that you’d like to tell others of what we were doing at school?

The seven other teachers who were not there at the event, wrote their stories out instead and sent them to our group chat for the others to read.

Table 3.1. Summary of stories gathered

	Storywork event I	Storywork event II
Oral stories – Video	20 stories	11 stories
Written stories – Artifacts	None	17 stories

3.3.6 *Analysis*

Units of Analysis. I center teachers’ stories as the unit of analysis in this paper over two storywork events. I use the idea of “events” based on Wortham’s (Wortham, 2001a) analysis on storytelling and narrative events, where dialogue and those who participate and make meaning in with need to understand narrated content only by taking into account “various aspects of the storytelling event

in which the utterance occurs” (Bakhtin, as cited in Wortham, 2001, p. 20). In the findings I juxtapose the stories of six individual teachers at the two storywork events and suggest emerging sensibilities at each event and how they shifted from one event to the next.

Translations. The stories were transcribed in Thai and then translated into English. However, the transcripts in both Thai and English were used during the analysis. Translation in qualitative studies is complex (van Nes, Abma, Jonsson, & Deeg, 2010). Scholars have noted on how “language is a two-way process; language is used to express meaning, but the other way around,, language influences how meaning is constructed” (van Nes et al., 2010, p. 314). We perceive and experience the world differently based on the language of use and the languages that we know. Each language and the ways that people move through them also has its own affordances and constraints. It was often hard to capture the full and multiple meanings and sentiments in Thai as in English. Thus as much as possible throughout the data collection and reading process, we have tried to use both Thai and English in our coding as well as writing of this study. As we worked with Indigenous families, other languages such as Akha and Hmong were also used and as the researchers’ did not have proficiency in these languages, we relied on the young people who also provided translations for our team.

My parents speak like 2-4 languages. It’s common in a lot of other places in the world – instead of hegemony, it was about multiplicities, we learned each others’ languages. As I kid, I also grew up hearing different sounds from my ah ma, ah gong and from the aunties in the neighborhoods – Chinese, English, Hokkien, Malay, Hokchieu. I started speaking Thai at 12 but have little formal language learning in it. I learned a little Lahu, sang Lahu songs in the village but speak little. I move through worlds easily because of it but I often feel the burden of doing much of the work of translation across and between time and space. I also think I like seeing how things move and make different sense based on the languages that we see and how we read the world. I hope the use of the two languages (albeit dominant languages), helps to bring out the multiple ways discourse can be read and interpreted to get us to a fuller picture of human sense-making and our dreams for it.

3.3.7 Collective Analysis

I’ve always wondered about what it would mean to do collective analysis of a work. This is far from being able to tell collective and heteroglossic stories within the paper. Methodologically, what would it mean to move closer to having coding selected by those whom we research with? Especially if stories are gifts, how do we honor this data, these stories?

Coding Round 1: Creating the Code Book. The initial development of codes of the data used a Grounded Theory Analysis (Charmaz & Belgrave, 2002) where I began by coding a random sample of 1/3 of the stories (6 teachers' stories) to develop the first round of coding. This code was presented to the research team who was familiar with the data, the teachers, and the context (Sukanda, Panthiwa, and Pam) and a colleague Mario Guerra who was familiar in qualitative coding but was not part of the study. Each member of this collective then coded these six teachers individually using an excel spreadsheet and/or Dedoose. I then compiled our points of consensus and questions in excel. Using this master spreadsheet, we then met to come to collective consensus on 1) our code book and definitions of each code, 2) our coding table (why we felt that code was present or not), 3) iterate on our coding scheme, adding or modifying the codes that we were using, and 4) clarify translations as we moved between the languages of Thai and English to ensure the teachers' voices carried as much of its meaning in its English translation as well as Thai.

Coding Round 2: Coding for Emergence. With a corpus of agreed-upon codes and code book, I returned to the full dataset to continue coding the rest of the teachers' stories. To ensure I paid attention to heteroglossia, I coded the rest of the stories looking for emergence and difference. There were two other codes that emerged from the other teacher stories, "changes in teacher learning" and "renewed practice" as teachers talked about how Tutoría wasn't a new practice, but one that was renewed and re-storied, as an extension of what they have always done as teachers. I added those two codes to our corpus and conducted one last round of re-coded the rest of the stories.

Coding Round 3: Collective code selection. With our confirmed codes the research/ design team returned to the schools in January 2019 to share our initial analysis with the group of teacher leaders at Sahasat. This comprised of a large group meeting and three small-group PALS team meetings (PALS teams are similar to teacher working group, divided by Upper Secondary, Lower Secondary, and Primary-level teachers).

At the large group meeting, we showed pictures of ourselves both in Feb 2015 and October 2018 to begin reflecting on how we have changed in our time together and the role of stories in that. We then watched video of the stories we told in the Web of Passion session (Picture 1 below).

Then we met individually with the PALS teacher teams to provide more in-depth reflection around about how storytelling and story listening impacted us as teachers and educators.

Image 1 & 2. Sahasat Tutoría team in February 2015 and in October 2018



Within these smaller groups, Sukanda, Panthiwa and I then presented our codes of the teacher stories and the visual maps of their conceptual ecologies. I showed them the codes and app I had created in Shiny where you could select from our corpus of 50 codes their top 5 codes that they wanted to see mapped in a conceptual ecology visual.

After the large team meeting, we met with three PALS teams that comprised of all the active Tutoría teachers at Sahasat. To do this collective code selection, each group discussed their top five codes that they were interested in. There was some overlap – namely the codes for “relationships”, “exchanges”, “home-and-school knowledge”, “interest and enjoyment”, and “student development”. There was a request to modify codes too. For example, instead of separating “home” and “school” knowledge, teachers were interested in how they as a group were thinking about the connections between home and school and requested for the code “home-and-school knowledges.” Similarly, instead of separating student and teacher learning, the group had proposed using reciprocal learning. Thus the iterations of the coding scheme and the selection of codes used in this study is primarily based on the conversations with the teachers that day about what we should pay attention to in these stories (See full code book in Appendix C). Based the teachers’ request, I focused on the codes they selected and iterated upon again to how these were extended in the data. The final codes used in this study are:

Teacher selected codes	Emergent codes
Student development	Difference (Heteroglossia)
Student learning	Possibility
Teacher learning	Futurity
Interest & Enjoyment	
Relationships/ Relational affinities	
Exchanges (Reciprocity)	
Home knowledge	
School knowledge	

Analytic memos. To begin the analytical memos, I created epistemic network graphs (Shaffer, 2017) for each teacher in R. The purpose of these were to visualize (1) what codes were present for each teacher and (2) how they were connected to each other. These analytical memos captured initial interpretations of the data and how the codes were connected to each other for each teacher, and the stories as a whole. These memos were shared with two other colleagues outside the project scope data so that they could support or refute the codes and interpretations how the codes seemed to be in relation with the others.

3.3.8 *Stories-so-Far*

The learnings in this study only analyzes stories from teachers two time points over three years. This is not to assume or create misperceptions of teachers going through a linear trajectory of learning – our trajectories of making and re-making relations with each other were far from that. As Tutoría is continued to be taken up in school, various points of power remain unchallenged, reconstituted, and dynamically intertwined in a nexus that shifted and remained the same over time and space. These changes were not linear, nor do they continue to be. This does not mean that shifts in teachers’ meaning-making were definitive, stable, nor foreclosed, but rather part of a network of relations that opened up through story. They were our stories-so-far (Massey, 2005). The stories I present in this paper comes out of the many relationships formed over the course of three years. Building relationships to people, to places, and to ideas took time; our ethical commitments to these relationships were emergent and tested through “cycles of ethical negotiation, regulation, and action” (Booker, 2016, p. 24).

3.4 FINDINGS/LEARNINGS

Stories and storywork remains undertheorized in teacher education and how they create possibilities for the joint pursuit of new horizons possible. Teacher stories illustrate storywork as a theory of learning that has epistemological (ways of knowing), onotological (ways of being), and axiological (ways of valuing) implications for who teachers imagined themselves to be in their own trajectories and in relation to each other. If stories are the theories to be in the world (Archibald et al., 2019; Brayboy, 2005), then teacher stories can illuminate what they consider important, their philosophies of teaching and learning, and their visions for change at school. I find that storywork (1) shifted teachers' designs and visions for change over time and (2) collectivized change for expanded ethical and political possibilities at Sahasat.

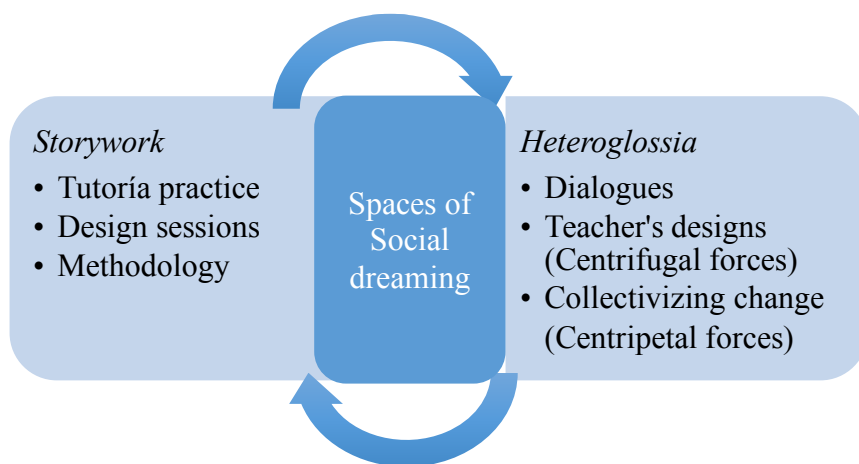


Figure 3.1. Relationship between storywork and heteroglossia towards social dreaming

In the findings, I go through the stories of six main teachers at each storywork event. For each teacher, I organize the findings by first presenting their story at the first storywork event and discuss some emergent themes. I follow that practice for storywork event II. Third, I juxtapose their stories from one storywork event to the other to suggest some shifts that can be observed from their two stories. I pay particular attention to their stories of school – (1) their shifting axiological sensibilities over time and (2) how they dreamed of iterating our design moving forward in ways that were important to them. I end each teacher's story with similar themes from others in the teacher team.

Across the two storywork events, I illustrate how heteroglossia grew in complexity across our designs. I find that teachers' narrated attention to heteroglossia in Tutoría had implication at two levels. First, I gather the implications heteroglossia had on our design and pedagogical decisions at Sahasat. Second, I show the ways heteroglossia through storywork shifted relational qualities and possibilities for collectivizing around humanizing work at school.

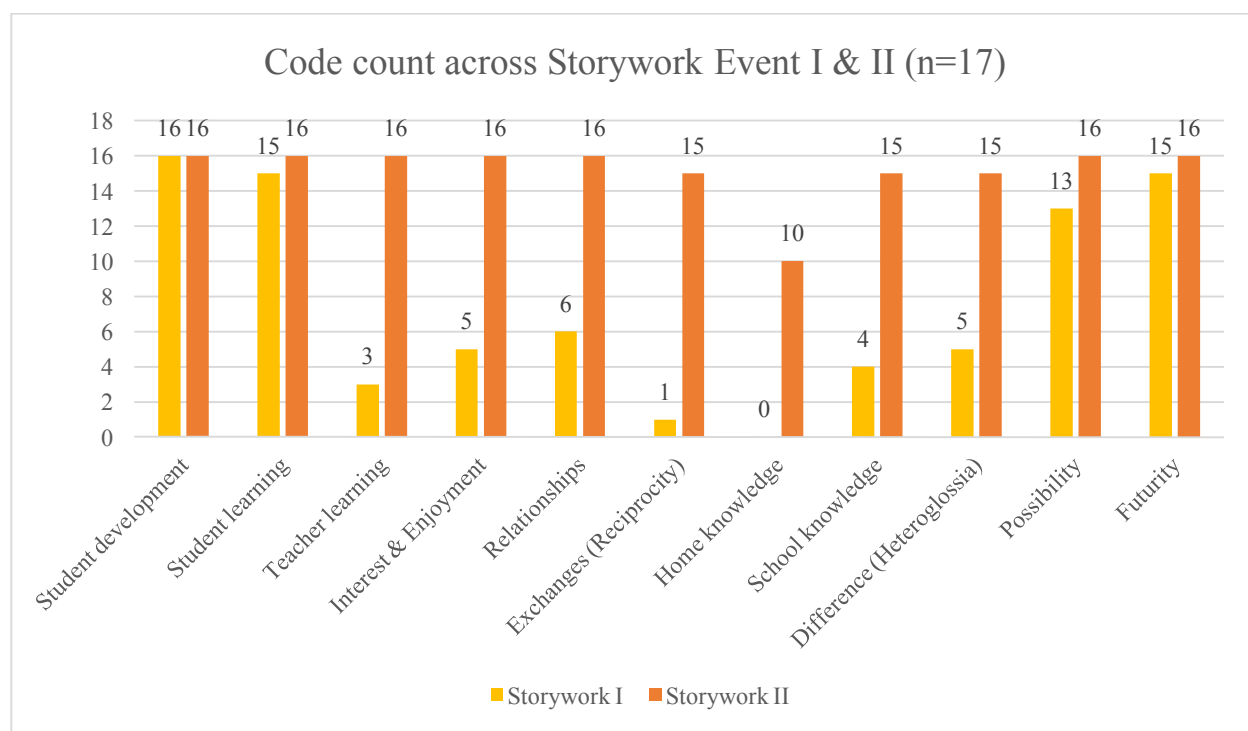


Figure 3.2. Summary of code counts across storywork event I & II

From Figure 1.2, we can see that all codes were coded more frequently in storywork event II. The codes that increased the most in descending order are: exchanges or reciprocity (increase of 14), teacher learning (increase of 13), school knowledge and interest and enjoyment (both an increase of 11). Difference (heteroglossia), home knowledge, and relationships all increased by 10. It is also interesting to note that student development, student learning, possibility, and futurity code already began as important codes in storywork I and remained high at storywork II, but their *designs to get there* shifted across time. At storywork event II, student growth and future possibilities now were connected to heteroglossia, relationships, home knowledges, reciprocity, enjoyment, and teacher learning. As I continued to sit with their stories, what seemed evident was teachers' attention to heteroglossia or difference. This was an emergent code in the data and it

seemed characterize the diverse and divergent ways teachers paid attention to, enacted, and grew heteroglossia at Sahasat in ways that felt powerful to them. I thus explore how heteroglossia was connected to the various other codes and what the implications for growing heteroglossia at school expanded for us in our design (See Table 3.2 for the multiple ways that heteroglossia was taken up).

Table 3.2. Summary of the ways teachers were growing heteroglossia through story

<i>Teachers</i>	<i>Centrifugal forces</i>	<i>Centripetal/ Collectivizing forces</i>
Kru Ann	Heteroglossia as adaptive storylistening	Heteroglossia as friendship
Kru Rungroi	Heteroglossia as family and community knowledges	Heteroglossia as designing participation with students, families, and communities
Kru Jan	Heteroglossia as storylistening for alternate styles and knowledges to reframe deficit	Reciprocity across generations
	Heteroglossia as reciprocity among student and teachers	Heteroglossia as reciprocity among student and teachers
Kru Surang	Heteroglossia as Invitations (as opposed to interventions)	Heteroglossia as (Re)storying roles
Kru Noom	Heteroglossia as Tribal exchanges	Heteroglossia as Tribal exchanges
		Heteroglossia as pride and unity
		Heteroglossia as sustainable development
Kru Noon	Heteroglossia as starting from home	Heteroglossia Movement Building through Storywork

Teachers seemed to cultivate heteroglossic multiplicities that refuse assimilative paradigms common in nation-state schooling. Each teacher started growing heteroglossia in different ways that were meaningful, resonant and powerful to them. Using teacher stories, I illustrate the many ways that heteroglossia was expanded at school. We begin with Kru Ann.

Kru¹⁵ Ann

Kru Ann is an upper secondary (Grade 10-12) Chemistry and Health teacher. She is Thai and had been teaching at Sahasat for almost 10 years.

¹⁵ Kru or ครู means teacher. I have always acknowledged them as such and wish to continue to do so in recognizing my own place in the work in relation to these group of teachers.

Storywork event I

1. The very first problem that we met with since we were teachers was that students didn't
2. dare to express themselves; for example, doing the experiment even though they had
3. learned already, with us, they had experimented already, and they had experienced it
4. themselves and learned it by themselves. but when we asked them to share it in the front,
5. they didn't dare to speak. They don't – it seems like they do not have confidence in
6. themselves. They also will not dare to speak even though they had got held or caught,
7. [what they learned]. They have already finished learning everything to the end. But when
8. we took it to apply with uh what Tutoria, this (thing), which is at least when a friend
9. taught a friend like this, at least they could express their opinion. He had the courage to
10. talk. He passed on what he knew to others. [...]“why did I become a teacher, right?” At
11. first I hadn't thought about it. I hadn't thought (laughs)... but.. because I wanted at first
12. when I came to apply (for this job) because I had never been a teacher before, but
13. wanted to have experience. But then I became a teacher and there was my first generation
14. of my students who graduated and they are going to college and they are going to
15. graduate from their Bachelor's degree. And also many students from later generations
16. who finished M. 6 (Grade 12)/ They came back to us (school) on special days such as on
17. Mother's Day. Even though I never had my own child, they came with a jasmine and told
18. me that I was like his/her mother and thanked me, that I helped them I led him/her to
19. think, led him/her to think about continue studying and in the near future, they will
20. become successful soon.

ปัญหาแรกที่เรพบตั้งแต่แรกที่เรเป็นครูก็คือเค้าจะไม่กล้าแสดงออกเช่นการทำการทดลอง ถึงแม้ว่า เขาจะได้เรียนแล้วกับเรา เค้าได้ทำการทดลองแล้ว เค้าได้สัมผัสเองแล้ว เรียนรู้อเองแล้ว พอให้นำมาพูดข้างหน้าเนี่ยเค้าจะไม่กล้าพูด เค้าจะไม่มีความมั่นใจในตัวเอง เค้าก็จะไม่กล้าพูดทุกๆ ที่เค้าจับ เค้าเรียนมาหมดแล้ว แต่ว่า นำมา apply กับเออ อะไรนะ Tutoria เนี่ยก็คือว่า อย่างน้อยในการที่เพื่อนสอนเพื่อนอย่างเนี่ยจะค่อนข้างน้อย เค้าก็ได้แสดงความคิดเห็น เค้าได้กล้าพูด เค้าได้ถ่ายทอดให้คนอื่น [...] ทำไมถึงต้องมาเป็นครู ใช่ไหมคะ ตอนแรกก็ไม่ได้คิดอะไรคะ ไม่ได้คิด แต่ว่า (หัวเราะ) เพราะว่า แรกๆ ที่มาสมัครก็เพราะว่า เราไม่เคยเป็นครูก่อน แต่ว่าก็อยากมีประสบการณ์ แต่ว่าพอได้เป็นครูไปแล้ว และก็มีความสุขรุ่นแรกที่เรียนจบอะคะ ก็ตอนนี้ เค้ากำลังจะเรียนจบชั้นปริญญาตรี แล้วก็ลูกศิษย์หลายๆ รุ่นที่ ที่จบ ม.6 ไปแล้ว เค้ากลับมาหา หาเราในวันที่เป็นวันพิเศษต่างๆ ไม่ว่าจะเป็นวันแม่ ถึงแม้ว่าเราจะไม่เคยมีลูกแต่ว่า เค้ามีดอกมะลิมา แล้วบอกว่า เราเปรียบเสมือนแม่ของเค้า แล้วก็ขอบคุณเรา ที่ทำให้เค้าคิด ให้เค้าคิดที่จะเรียนต่อ และเค้าก็จะประสบความสำเร็จในอีกไม่นานนี้แล้ว

At storywork event I, Kru Ann shares she struggle with students who do not “dare to speak” or “express themselves” (Lines 2, 5 & 6). She attributes this to a lack of confidence in her students even though “they already finished learning everything to the end” (Line 5-7). However, with Tutoria, the changing contexts of when “a friend taught a friend... at least he could express their opinion” (Line 8-9). This perceived lack of confidence was a blanket “problem” that teachers have with students in general. While Kru Ann never really thought about why she wanted to be a teacher, but the motivation for her continuing in the profession is seeing her students who had come back to school “and thanked me, that I helped them I led them to think, led them to continue studying... to be successful soon” (Line 18-20). Seeing her former students graduate and continue onto university to get their Bachelors degree was gratifying for her as “they will become successful

soon” (Line 20). She saw took up a “mother” position for her students and was part of their success, with pathways to success being elevated as continuation in systems of education. Her student’s return of gratitude was important to her too. In storywork event II, Kru Ann shares another kind of struggle, not with her students, but within herself.

Storywork event II

1. The most stressful time is when we first knew about and adopted Tutoria. There was a
2. fight in my mind and I myself asked a question, if this kind of teaching and learning
3. works with my subject? I had to struggle with my own thoughts, that I had to change my
4. methods of teaching to be like that (Tutoria), or creating Temas so that they aligned with
5. what I had been doing, and taking the same knowledge, but change strategies of teaching
6. in order to make student more interested in and help students have more responses with
7. me. I had to create more kinds of questions and think about how to link them with the
8. content and how to get the preferences from the students.

คือช่วงเวลาเริ่มแรกค่ะที่ได้รับที่ได้รับทิวทอเรียมาค่ะ คือเราจะต้องต่อสู้กับความคิดของตัวเองว่าเราจะต้องเปลี่ยนวิธีการสอนของเราไปอย่างนี้เนาะ หรือการที่เราจะต้องสร้างเต็มมาเพื่อให้เข้ากับสิ่งที่เราเคยทำจากเดิมอะ ไข่ม้อยคะ แล้วเราก็ต้องมาเอาความรู้เดิม แต่เอามาเปลี่ยนกลยุทธ์การสอนเพื่อให้มันเด่น น่าสนใจขึ้นแล้วก็เด็กได้โต้ตอบกับเรามากขึ้น เราต้องคิดว่าเราจะต้องตั้งคำถามอะไรหรือจะต้องเชื่อมโยงยังไงเพื่อให้เข้ากับเนื้อหาของเราแล้วเด็กจะต้องชอบด้วย

Heteroglossia as Adaptive Storylistening

Kru Ann talks about “the fight in my mind” and “the struggle with my own thoughts” (Lines 2; 3) when she had tried to see if Tutoria would work with her subject, Chemistry while also growing into storylistening with her students. She speaks about needing to use the same content that “aligned to what I had been doing...but change the strategies of teaching”, to storylisten and be closer to the interests of her students (Lines 4-5). At storywork event II, she now saw herself as the one needing to adapt and change, rather than her students. Furthermore, Kru Ann speaks of centripetal and centrifugal forces at work – to both use the same content in chemistry *and* needing to change the ways that they work so that they can be more adaptive and responsive to the interests of their students. Even within “the same knowledge” Kru Ann found ways to “create more kinds of questions” to “help have students more responses with me” (Lines 6-7). Seeing and valuing the diverse and heteroglossic interests of students was a kind of new axiological commitment that required Kru Ann to be adaptive with them. I suggest the way Kru Ann’s describes her internal struggle illustrates how difficult it is to design learning at school for healthy heteroglossia, where students’ interests, diversity of thought, and multi-voicedness are seen as important cultural resources for teaching and learning. Pedagogical choices carry with them axiological stances and

ethical qualities and I characterize Kru Ann’s move through such a struggle as a kind of everyday disruption of power relations where alternate possible futures could be illuminated through opening for heteroglossia.

Heteroglossia as Friendship

Kru Ann in storywork event II also shares a story about shifts in relationships among teachers at school that have changed. Usually school is segregated in that the secondary teachers work together and do not go to other buildings but through tutoring and working with other teachers, new friendships based on mutual care seemed to surface.

1. I am the one who don’t make friends with those in different buildings. It’s easy to say that
2. most of the Mathayom Plai (Upper secondary) teachers are with Mathayom Plai (Upper
3. secondary) teachers, and the Prathom (Primary) level teachers who are quite old, mostly
4. they are in their level group and they will not make friends who are in different
5. buildings [...] When I talked with P’Kung again, I asked her what was her impression
6. during the two days that we were together. And she told me that she was impressed since
7. the first sentence that I asked her if she had eaten something. Actually, that was not I
8. intended. It’s just a warm up question about what energy is. But P’Kung said that this
9. question made her feel that I cared for her, so I got a good friendship in return [...]
10. Tutoría helped us have more friends and have relationships with other people. Tutoría
11. fully pulls the potential that we have. I can think independently for sharing with
12. other people; for example, creating Temas from local knowledge is pulling out the
13. knowledge and local wisdom out. Tutoría helped us know who is good at doing
14. something or what they are good at so we can support them in ways to go further.

อ้อเนี่ยจับได้พี่กุงภาณุมาศซึ่งอยู่ตึกประถมต้นคะแล้วเราจะเป็นคนที่ไม่คบเพื่อนข้ามตึกพูดง่าย ๆ คือส่วนใหญ่ก็อยู่ ม.ปลาย ครูประถมส่วนใหญ่ก็จะแยกหน่อยเขาก็จะอยู่ช่วงชั้นของเขา เราจะไม่คบเพื่อนข้ามตึก [...] ก็พอได้คุย กับพี่กุงว่า ถามพี่กุงว่า เราที่ได้อยู่ด้วยกัน 2 วันนี้พี่กุงประทับใจอะไรหรือ พี่กุงเลยบอกว่า ประทับใจตอนประโยค แรกคะที่อ้อถามว่า พี่กุงกินข้าวมารึยัง อย่างงี้คะ จริงๆ แล้วมันไม่ใช่คะ มันถาม โดยบังเอิญเพราะมันจะเข้าสู่เนื้อหา ว่าพลังงานคืออะไร แต่พี่กุงกลับบอกว่า คำถามนี้ทำให้พี่กุงรู้สึกที่อ้อเนี่ย แสดงความใส่ใจ หรือว่ามีความห่วงใย ให้กับพี่กุงอย่างงี้คะ แล้วก็ อ้อก็เลยได้รับมิตรภาพที่ตึกกลับมา ณ วันนี้นะ ก็เลยคุยกับพี่กุงคะ แล้วก็เลยมีเพื่อน รุ่นพี่เพิ่มขึ้น [...] ทิวทอเรียทำให้เรามีเพื่อนและการปฏิสัมพันธ์กับผู้อื่น ได้ดึงความสามารถที่มีอยู่ออกมาได้อย่าง เต็มที่ ได้มีอิสระทางด้านความคิดเพื่อแลกเปลี่ยนกันเช่น การทำเต็มมาจากความรู้ในท้องถิ่น เป็นการดึงความรู้ และภูมิปัญญาออกมาทำให้รู้ว่าใครเก่ง หรือถนัดเรื่องอะไร และเราจะส่งเสริมเขาได้ในทางไหน

Here, Kru Ann recounts a time working with a teacher she did not know for the first time, a primary school teacher, P’Kung. Part of the Tutoría practice is to be in face-to-face dialogue with one another, and teachers too come into Tutoría dialogues with one another. At the level of utterance, when Kru Ann asked “her if she had eaten something” (Line 7) as a way to start the dialogue. This was related to Kru Ann’s Tema on nutrition and energy but P’Kung understood it as a gesture of care, and “made her feel that I cared for her” (Line 9). I suggest that moment-to-moment storywork and storylistening was an opening for different voices to come together. While Kru Ann’s

introduction was taken up in a way that was not “intended” and just a “warm up question” (Line 8), her explicit listening to heteroglossia was a way to understand another person in their fullness, a gaining of “friendship in return” (Line 9). Finally, Kru Ann talks about how Tutoría “helped us know who are good at doing something or what they are good at so we can support them where to go further” (Line 12-13). It seemed that it was in listening and valuing heterogeneous forms of “good” that supports collectives to “go further” (Line 13). Listening seems to be a kind of centrifugal and centralizing force that expands heteroglossia to transform relational activity that actually helps collectives “go further”, an opening for social dreaming (Line 13).

Six other teachers expressed similar sentiments as Kru Ann when working with new teachers, while four other teachers felt working among were both points of tension for them due to age or tensions with working with other teachers. Overall, however at storywork event II, 16 out of the 17 teachers mentioned how they have become closer as a collective (among students and students, teachers and teachers, teachers and students), where “closing the distance between the self and other” as potentials for sustaining a movement (Levinas, 2003 as cited in Zavala, 2018).

Similarly, Kru Kate, an Akha upper secondary English teacher shares,

1. Normally, when we the teachers finish teaching, we don't sit together and chat or share
2. about how the students are after we teach this/that. But Tutoría is something that after we
3. roll out in class, we can meet and share with each other about how each person feels after
4. he/she has applied it. That's what I like when we return to meet and share. The various
5. stories that I want to tell about tutoría in SHS is doing tutoría at SHS has made the
6. relationship between teachers and teachers, teachers and students, and students and
7. students better.

ปกติแล้ว คณะครูจะสอนเสร็จแล้วก็ไม่ได้มานั่งคุยกันแชร์กันว่าสอนเรื่องนี้แล้วเด็กเป็นอย่างไร แต่ว่าทิวทอเรียคือ พอนำไปใช้ในห้องเรียนแล้ว แล้วก็มีการมาแชร์กันและพบปะกันว่า แต่ละคนรู้สึกอย่างไร นั้นไปใช้แล้วเกิดผลอย่างไร รู้สึกชอบตรงนี้ค่ะ ที่กลับมาแชร์กัน เรื่องราวต่างๆ ที่อยากเล่าเกี่ยวกับทิวทอเรียที่สหศาสตร์ศึกษาคือ ทิวทอเรียในโรงเรียนสหศาสตร์ศึกษาทำให้ปฏิสัมพันธ์ระหว่างครูกับครู ครูกับนักเรียน นักเรียนกับนักเรียนดีขึ้น ได้เห็นความสามารถในการถ่ายทอดของนักเรียน จากวิถีชีวิตในหมู่บ้านของนักเรียน ทิวทอเรียกำลังเติบโตขึ้นเรื่อยๆ ในการติในโรงเรียนสหศาสตร์ศึกษาค่ะ

Kru Kate talks about the benefit to “return to meet and share” after they “roll it out in class” (Line 3, 4). Interspersed with working in classrooms, teachers were designing for storywork with each other, in ways that made the “relationship between teachers and teachers, teachers and students, and students and students better” (Line 6-7). Storytelling and storylistening with each other about “how each person feels after he/she has applied it” (Line 3-4) seems to be the basis of deepening

relationships among the teacher team. It seems listening to the different ways Tutoría could be implemented is a variety of contexts forms, is a way that teachers here acquired relations and friendships in school to collectivize towards everyday disruption of power. In this way, individual humanizing gives way to larger actions for collectivizing movements at school.

Storywork I &II

Across the two storywork events, Kru Ann offers insights to how storywork can expand heteroglossia towards social dreaming. Storytelling and storylistening within teaching and learning can help teachers be adaptive with their practices to take into account the varied interests and expertise of children for transformed relational activity at multiple levels. Furthermore, reciprocal relationships were not among just teachers and students, they had lateral impacts with how teachers collectivized among themselves. Tutoría's focus on changing the interactional activity through horizontal relationships of teaching and learning did not just impact the classroom but impacted the school structure itself. Storywork was an opening for heteroglossia with their students and with each other in ways that also re-mediated overall school structures and the possibilities for co-creation and collective social dreaming.

Kru Rungroi

Kru Rungroi was the third speaker of this storywork event. He is from Isarn (the Northeast of Thailand bordering Laos) has been a long-time teacher at Sahasat school. He teaches upper secondary biology (Grade 10-12) and Head of Quality Assurance in Sahasat school (หัวหน้างานประกันคุณภาพ).

Storywork event I

1. Because I want, want to pass on my/our knowledge to children so that they can
2. know that being a teacher is difficult. I want to inspire the children to want to be
3. teachers too so that they will pass on my/our knowledge. Observe the one that, the
4. ones who come to be tutors. They have a qualification/characteristic of being a
5. teacher which is a starting point of being a teacher. It is in line with my dream. I
6. want to produce more teachers, create people.

เพราะว่าอยาก อยากถ่ายทอดความรู้ของเราเองให้กับเด็ก ให้เค้าได้รู้ว่า การเป็นครูเนี่ยมันยาก อยากสร้างเด็กที่อยากเป็นครูด้วย ให้เขาถ่ายทอดความรู้ของเรา เป็นครูนี้ไม่ได้เป็นครูได้ง่ายๆ นะครับ แล้วการสร้างความเป็นครูของเราเนี่ย มันใช้กับ Tutoria ยังไงนะครับ สังเกตคนที่ คนที่มาเป็น Tutor เนี่ย มันจะมีคุณสมบัติหนึ่งก็คือ การเป็นครู เป็นจุดเริ่มต้น แล้วก็มันก็ตรงกับความฝันนะครับ อยากสร้างครูเพิ่มขึ้น นะครับ ช่วยสร้างคน จบครับ ก็สร้างคน ใจครับ สร้างคน ให้เป็นครูเหมือนที่ผมอยากสร้างใจครับ

In storywork event I, Kru Rungroi's sees learning as linear knowledge transmission and focused on reproduction from one generation to the next. He wants children to be teachers so that they will subsequently "pass on my/our knowledge ถ่ายทอดความรู้ของเรา" (Line 3). This seems similar to Bakhtin's professional or generic languages that are intent on "verbal-ideological centralization and unification" through centripetal forces (Bakhtin, 1981, p. 272). Ensuring the continuity of settled knowledges was thus Kru Rungroi's politic in storywork event I. At storywork event I, Kru Rungroi perceived Tutoría as a way to reproduce that linear trajectory to "produce more teachers, create people," particularly those who also already have the desired qualifications or characteristics of being a teacher" (Line 4).

Kru Rungroi's story of education to "pass on my/our¹⁶ knowledge" to children also is read as unidirectional. The idea of "passing on knowledge" (ถ่ายทอดความรู้) is echoed by seven others in storywork event I. Teachers talked about passing on knowledge, to create a "lineage of knowledge, the lineage that is endlessness" that Tutoría could help create (Kru Chuti). The directionality of the passing of knowledge often was from teacher to student (14 out of 15 stories) for the purposes of apply that knowledge in their everyday lives (5 teachers), building of student academic futures (5 teachers), students who could then pass that knowledge on to their friends (11 teachers), and to see larger changes within Thai society (3 teachers).

One of the reasons knowledge should be passed on is so that "so that they (the students) can know that being a teacher is difficult" (Line 2). Kru Rungroi feels that students are unaware of the labors of being a teacher and thus perhaps are seen as appreciative of the efforts of teachers at school. Another teacher, Kru Nid also shares that she wants "Thai children, be more responsible because at present Thai children don't have a sense of responsibility. Tutoría is a way of making children be more responsible." Kru Noon, the academic head at Sahasat affirms this in her story when she shares that "One thing that I don't like is that if there is somebody says that Sahasat is bad, the teachers are not good, the students are stupid... Teachers are tired of teaching, we know that the tasks, the teachers' task are many... The students don't want to go to class, some of the students don't want to study. Kru Rungroi once opened a free class for them, free. The kids still didn't come" It seems that at storywork event I, teachers are sharing labored sentiments and being

¹⁶ In spoken Thai, the word เรา can mean both my and our simultaneously.

discouraged by how they as a school is framed with deficits by dominant Thai society. Teachers then seem to be mirroring those sentiments with their students that contribute to the devaluation of Indigenous ways of life by those who say that “Sahasat is bad, the teachers are not good, the students are stupid.”

Storywork event II

1. We at Sahasat have brought the knowledge from communities to be added in the
2. Tutoria activity on our special Science Day. We have arranged various knowledge
3. zones such as toys from banana leaves, making papaya salad, making Thai dessert,
4. cooking Kua Ham Kai, making flowers from Pandan leaves, and raising fighting cocks
5. etc. What we can see is that getting knowledge doesn't have to be only in the
6. academic way, but it can be from our everyday ways of life and it is applicable. We
7. can arrange and invite teachers, students, parents, and communities to participate in
8. learning activity. This made us at Sahasat happy after we have attended Tutoria
9. Relationship for three years.

พวกเราสหศาสตร์ศึกษาได้นำความรู้จากชุมชนมาจัดกิจกรรมการเรียนรู้แบบ Tutorial Relationship ในวันสำคัญ เช่น วันวิทยาศาสตร์ โดยทำเป็นฐานให้ความรู้ เช่น ของเล่นจากใบตองกล้วย การทำส้มตำ การทำขนมเทียน การทำข้าวแฉ่มไก่ การพับดอกไม้จากใบเตย การเลี้ยงไก่ชน เป็นต้น ซึ่งมีครูแกนนำ(ครูพี่เลี้ยง) และแนวทางให้กับครูเครือข่าย ที่เป็นเพื่อนครูในการนำการดีวให้กับนักเรียน และมีการส่งต่อความรู้แบบมีความสุข จะเห็นได้ว่า การได้มาซึ่งความรู้ นั้นไม่จำเป็นต้องเป็นวิชาการแต่เป็นวิถีชีวิตที่เราใช้ในชีวิตประจำวันของเราและสามารถนำไปใช้ได้จริง และเราสามารถจัดให้ครู นักเรียน ผู้ปกครองและชุมชน เข้ามามีส่วนร่วมในการจัดกิจกรรมการเรียนรู้ในครั้งนี้ และเป็นเรื่องที่ทำให้พวกเรา ชาวสหศาสตร์ศึกษามีความสุขมากๆ หลังจากเราเข้าร่วม การเรียนรู้แบบ Tutorial Relationship เป็นเวลา 3 ปี”

Heteroglossia as Family and Community Knowledges

In storywork event II, Kru Rungroi uses the word “added in” instead of “pass on” when talking about knowledge systems and learning at school. In the physical set up of “science day” they arranged for “various knowledge zones” (Line 8-9). In Kru Rungroi’s opinion, Tutoria contributed to problematizing singular conceptions what counts as knowledges. He says, “What we can see is that getting knowledge doesn't have to be only in the academic way, but it can be from our everyday ways of life and it is applicable” (Line 11 -12). Storywork with young people also helped him storylisten and design for other kinds of stories, stories from families and communities to “be added in” at Sahasat. Such “everyday ways of life” gained power while the “academic way” seemed to lose its stronghold for learning at school. This is similar to a kind of de-linking from colonial logics – a building towards other possible worlds and alternative modernities to resist settled knowledges at school (Bang et al., 2012; Mignolo, 2007). The recognition of the intellectual

and epistemic resources from home embedded within young people's "everyday ways of life" especially in tribal communities was mentioned by 10 of the 17 teachers.

Heteroglossia as Designing participation with students, families, and communities

As our design shifted, so did teachers stories of the design and how they are continuing to iterate on it. In our designing with homelands session, families that lived far away were not present at our designing with homelands session in August 2017. Kru Rungroi took this design iteration up in his story, stating a desire and need to "invite teachers, students, parents, and communities to participate in learning activity" (Line 7) so that their heteroglossic stories and voices are part of the decentralization "alongside" centralization of languages at school with Tutoría (Bakhtin, 1981). Communities and parents are seen as part of expanding what counts as knowledge. I suggest that are similar to centrifugal forces, forces that are directed away from the center to grow social and historical heteroglossia where knowledges are grown and "added to" across home and school.

Storywork I & II

Juxtaposing storywork I to II, Kru Rungroi expanded linear "passing on" of knowledges to broadening both what counts as knowledge and who should participate in learning at school. For him it was important to design and have the participation of families at school. It seems school's centripetal forces lose power for Kru Rungroi but the place of school is thus appropriated to be a central gathering space for heteroglossic participation and the meeting of voices from a wide range of actors. Designing participation with such as "teachers, students, parents, and communities" (Line 7) has affective implications for the group; it "has made us happy at Sahasat" (Line 8).

Kru Jan

The next storyteller I turn to is Kru Jan who is a former student of Sahasat and Primary 6 English teacher. She is Karen and is one of the 4 Indigenous teachers in our group of 20 Tutoría teachers.

Storywork event I

1. When I work every day, I intend to pass on the subject knowledge to my students. I want
2. to give to everyone, especially our tribal students. Some students are kids with
3. inferior opportunities. So I want them to have a better foundation and to have better life
4. and better chances like those that I have met... However, mostly we lead the activities,
5. but this time it might be good for us when we separate our students into small groups and

6. we will have student leaders to help us lead their friends to do some activities and pass on
7. to other friends... Now I'll give the next chance to my teacher. She used to be my Social
8. Education Study teacher, Kru Surang.

มาทำงานทุกวันก็ คือ ความตั้งใจก็อยากจะถ่ายทอดวิชาให้ลูกศิษย์นะคะ คือ อยากให้ทุกคน ยิ่งลูกศิษย์ของเราเป็นชนเผ่า บางคนก็เป็นเด็กด้อยโอกาส ก็อยากให้เขา เขามีพื้นฐานชีวิตที่ดีขึ้นแล้วก็มีโอกาสเหมือน เหมือนกับตัวเองที่เจอ ก็คิดว่า วิธีการแบบ Tutoria ก็น่าจะเหมาะสมกับกิจกรรมบางกิจกรรมที่เราใช้สอนเด็ก บางกิจกรรม ที่เราเป็นคนสอนอยู่แล้วใช้ใหม่คะ แต่เราก็เป็นคนนำส่วนมาก คราวนี้ก็อาจจะดีสำหรับเราในการช่วยเราที่ เราจะได้แบ่งกลุ่มเด็กออกเป็นกลุ่มย่อยๆ และจะมีผู้นำที่จะได้มาช่วยเรานำกิจกรรมให้กับเพื่อน แล้วก็ถ่ายทอดให้กับเพื่อนคะ ให้กับคุณครูของหนูคะ เมื่อก่อนเป็นครูสอนสังคมคะ คุณครูสุเจษ

In storywork event I, Kru Jan's connects her dreams of educational change with her own life and her specific desire to work with tribal students. In her story, she combines self-reflection, personal history, and dreaming forward for tribal students. She speaks of the “inferior opportunities” (บางคนก็เป็นเด็กด้อยโอกาส) that some tribal young people face generally, mirrored in her own life and in the ways she continues to “work every day” so that others too might “have a better foundation and to have a better life and better chances like those that I have met” (Line 3-4). Narratives of inferiority and possibility are felt in Kru Jan's own life (Million, 2008). Kru Jan sees herself in her students and feels the responsibility to do that for other young people who are like her and then they too could pass it onto others.

Reciprocity Across Times & Generations

Through locating herself in her students' trajectories, Kru Jan imagines similar pathways of learning for her students. The use of “like I have met” draws parallels and pathways forward for her students. She uses the word “met” that has a passive quality to it, almost emphasizing that opportunities both present themselves to be encountered and yet can be altered if there are people and elders who help expand those possible futures for young people. In her story, she locates herself in past, present, and future times and speaks of a sense of reciprocity across times thinking of those before and after her. Within these reciprocal relations, she focuses on a common and uniform narrative of linear progressions from “inferior opportunities” to future possibilities, with teachers as the main actors of change for young people in a centralizing way.

At the end of her speech, Kru Jan publically acknowledges her former teacher, Kru Surang as a recognition of an elder who was part of her having a “better foundation” a “better life and better chances.” and how teachers can and have opened up space for tribal students like herself. Within her narrative, Kru Jan connects herself in time by acknowledging those in the past-present who

have expanded the opportunities that she has “met” and her responsibilities forward to continue to do so for others. This acknowledgement makes the intergenerational teacher-student relationships within the group felt by the group. After Kru Jan’s story, seven other teachers (8 out of the group of 17) then proceed to make visible past teacher-student relationships in the room through a verbal public acknowledgement and a placing of themselves in relation to others former students or teachers in the group.

Storywork event II

1. After I saw the students tutoring one another in the classroom, I saw the ways the
2. students tried to teach their friends, I was so impressed that they tried to use their
3. own ways to explain to their friends. They used their own styles. Some of them used
4. their own ways besides the way I taught them. So, it made me feel that the students
5. were capable of doing (Tutoría) if they had been trained by me and they gained some
6. confidence and encouragement from me... And what was memorable, I remembered
7. when the teachers were gathered and tutored, and the students tutored their teachers. It’s
8. not only the teachers who were tutors. The students could tutor their teachers because
9. sometimes we don’t know but the students know, so the students can function in tutoring
10. although we are more mature and we graduated from higher level than them. But the
11. students can do. I have seen from Arn who has changed my thinking and I feel that I
12. cannot underestimate him because actually he is able to perform well in his role.

เขาได้ตัวให้กันเนี่ยคือเห็นจากลักษณะของการเด็กพยายามที่จะสอนให้เพื่อนอธิบายให้เพื่อน รู้สึกประทับใจว่าเด็กพยายามจะใช้วิธีของตัวเอง อ่า ใช้วิธีของตัวเองที่จะพยายามอธิบายให้เพื่อนๆตามสไตล์ของตัวเอง บางคนก็เสียงดังหน่อย บางคนก็ใช้คือนอกเหนือจากที่เราได้ตัวให้เขาอะคะ เขามีวิธีของเขาด้วยจ้ะ ก็รู้สึกว้าว เอ้อ มันทำให้เรารู้สึกว่าเอ้อเด็กทำได้คะ ถ้าเด็กเขาแบบได้ฝึกจากเรา ก็เขามั่นใจได้กำลังใจจากเรา พอเห็นละเขาทำได้ จากที่ตอนแรกเราคิดว่าเขาจะทำไม่ได้เลยจ้ะคะ แล้วก็สิ่งที่เป็นสิ่งที่จดจำก็คือ ได้เห็นภาพครูได้มารวมกันแล้วก็ตัวให้กันคะ แล้วก็นักเรียนตัวให้คุณครูไม่ใช่ว่าครูจะตัวให้นักเรียนเท่านั้นแต่นักเรียนสามารถตัวให้ครูได้ เพราะว่าบางทีเนี่ยเราไม่รู้แต่เด็กเขารู้ใจคะ เด็กเขาทำหน้าที่ตัวเตอร์ได้ ถึงแม้ว่าเราจะเป็นผู้ใหญ่กว่า เราจบสูงมากกว่าเขา แต่เด็กทำได้คะ เห็นจากภาพที่ธนากร เขาทำให้เราคิดว่าเราประมาทเขาไม่ได้นะ เขาก็ได้ เขาทำหน้าที่ของเขาได้ ค่ะ

Heteroglossia as Storylistening for Alternate Styles and Knowledges to Reframe Deficit

In her narrative at dinner during storywork event 2, Kru Jan talks what she has noticed in her own students as “they tried to use their own ways to explain to their friends” Kru Jan here talks about a memorable moment for her in our time engaging with Tutoría together. She mentions that students “used their own styles”, they “used their own ways” (Line 2-3) after being “trained by me and they gained some confidence and encouragement from me” (Line 5-6). She notes that here was a kind of training and role of the teacher in their learning and development but repeatedly elaborates that students added their own flavors and styles to teaching and learning. In fact, it was

these styles that “it made me feel that the students were capable of doing (Tutoría)” (Line 4-5). Storylistening to students heteroglossia styles refused and reframed deficit for Kru Jan.

Furthermore Kru Jan also points to her experience learning from students as a memorable moment for her. She recalls the story of Arm, an Akha student in Grade 6 that was tutor to Kru Noom on a home practice of trap fishing during a session that we had in August 2017 to work with designing pathways home in Tutoría (I examine this session in depth in my Article 3). Within this story, Kru Jan highlights her growing role as storylistener to challenge her own framings of students and their potentials. Students were not simply recipients of a teacher’s guiding but “students could tutor their teachers because “sometimes we don’t know but the students know” (Line 8-9). Kru Jan makes a distinction saying that “students can function in tutoring although we are more mature and we graduated from higher level than them.” While not discrediting the maturity and training of teachers, she acknowledged that there are sometimes and some things that teachers do not know but that students do, again presenting a challenge to singular settled definitions of who holds knowledge that counts. She emphasizes to the other teachers, “But the students can do” (Line 10-11). Students both had different styles that they could bring to the same content, *and* had knowledge that teachers could learn from as well. Kru Jan closes her stories with sharing reflections on how her prior beliefs were challenged. Arm “has changed my thinking and I feel that I cannot underestimate him because actually he is able to perform well in his role.” (Line 11-12). Storylistening to Arm allowed Kru Jan to articulate changes in her own deficit-thinking and underestimating the cultural and land-based knowledges that young people brought to schools, an opening for expanded heteroglossia.

Heteroglossia as Reciprocity Among Students & Teachers

Kru Jan acknowledges the role of teachers in the training and the preparing of young people in school. However, she moved from speaking about teachers from playing the sole role of opening and providing better opportunities for young people forward in time to one where reciprocity was also experienced within everyday teacher-student relationships. Intergenerational, reciprocal relationships were not only carried forward in linear time but also in the present. It is no longer the sole role of teachers to create learning opportunities for students but notions of who helped whom was complicated and expanded so that students too have a role in creating and contributing to the intellectual health of the group in reciprocal ways.

Storywork I & II

In comparing storywork event I and II, Kru Jan moves from framing students as have “inferior opportunities” to having “their own styles,” “their own ways” and “know things that sometimes we (teacher) don’t know.” Storywork afforded renewed possibilities for Kru Joy to expand the bounds of permissible knowledges and sense-making at school by attending to heteroglossia, engaging in reciprocal teaching and learning, and begin learning from young people. The scopes of knowledge or where learning could occur were no longer limited to just teachers; students could add to the multiplicity of styles of learning, to what teachers might not know and contribute to the richness of learning at school. Similarly, reciprocity in teaching and learning was expanded from a reciprocity of “giving back” across time (storywork event I) to include contesting powered teacher-student relationships where teachers could learn from students. For Kru Jan, it was less about reproduction forward and more about expanding the heterogeneous ways that people brought themselves into teach and learn in a Tutoría community of learners. Learning from students was mentioned by 9 other teachers from stories that came from storywork event II.

In storywork event I, Kru Jan passes the string to Kru Surang. We now turn to her stories.

Kru Surang

Kru Surang (Thai) is one of three veteran teachers in the group. She has been the social studies teacher to at least five other teachers in the group and was three years from retirement at this point in time. She is given the string by her former student Kru Jan who is mentioned above.

Storywork event I

1. I often saw the students in that time, especially Sahasatsuksa¹⁷ students who lived in
2. dormitories and were often sick and regarding the wisdom to solve the problems, the
3. students didn’t have it. When I became as a teacher here, then I tried to train the
4. students to be leaders who dare to think, to do, to make decisions and solve a
5. variety of problems. At minimum, they could help one another among their groups
6. of friends.

มาเป็นครูทำไม อยากบอกว่า มาด้วยใจนะคะ มาด้วยใจ เพราะว่า ก่อนที่จะมาเป็นครูเนี่ยทำงานมาหลาย อาชีพแล้ว แต่ว่าสิ่งที่เจอ มักจะเห็นเด็กตอนนั้น โดยเฉพาะเด็กสหศาสตร์คะ เด็กจะอยู่หอพักและเด็กก็มักจะป่วยเป็นโรคภัยไข้เจ็บบ่อย แล้วก็ไหวพริบปฏิภาณในการตัดสินใจในการแก้ปัญหา เด็กก็ไม่มี พอมาเป็นครู ที่นี้แล้วก็พยายามฝึกครูเป็นผู้นำ กล้าคิด กล้าทำ กล้าที่จะตัดสินใจปัญหาต่างๆ ที่เกิดขึ้น อย่างน้อยเขาก็สามารถช่วยเหลือเพื่อนด้วยกันไปสู่คนภายนอกได้มากขึ้น

¹⁷ Longer name for Sahasat school.

Kru Surang expressed her concern with Sahasat students who “were often sick” and who did not have “wisdom to solve the problems” that they were facing. Kru Surang’s statements can reinforce singular narratives of Indigenous young people and their depressed conditions. At the same time, Kru Surang also recognizes the agency that students have to solve challenges and “help one another among their group of friends” as acts of mutual reciprocity (Line 5-6). Uncomplicated narratives of students – their lack of wisdom and also their potentials to make decision and take up agency in their lives were also circulated in the larger group.

Eight other teachers talked about the social contexts of discrimination, sicknesses, social ills in which Indigenous young people grow up as motivations to create leaders and teachers of their students. For example, Kru Thep talked about how “there are many dangers such as the different kinds of crimes, robbery, game addiction” and also wanting to “make my students be good citizens of our country, to be the powerful strength of the country in the future.” Teachers seemed aware of larger social contexts – usually ones of deficits that were playing out in the lives of their students.

Kru Surang’s intervention and vision of teaching was then to train students who “dared to think, to do to make decisions and solve a variety of problems” (Line 4-5). This is idea of “dare” is taken up by 5 other teachers within the circle and as an external critique of Sahasat school and students. This is reinforced by educational authorities who has left this critique with Sahasat to do better. Kru Noon (Karen) the academic head shares,

1. Every word that the Sor Mor Sor (Office for National Education Standards and Quality
2. Assessment) criticized was that students –Ajarn (Kru) Rungroi also heard- was that our
3. students didn’t dare to show their opinions. And therefore, myself, my own heart, wants to try but the attempt doesn’t just depend on myself.

ทุกคำที่ สมศบญรุ่งก็ได้ยิน เด็กของเราไม่กล้าแสดงออก จัดเวทีให้เด็ก จัดเวทีอะไรก็ได้ให้เด็กกล้า. ดิงมา อ .
พูด กล้าแสดงออก แล้วก็ คือ ก็ ตัวเองเนี่ย โนมแล้ว ใจของตัวเองเนี่ย อยากจะลอง นะคะ แต่ว่าการลองครั้งนี้
มันไม่ได้ขึ้นอยู่กับตัวเอง

Sahasat students are seen as not daring to think or speak, is framed as a problem in school and in Thai society at the National Education office. However, this blanket label is also given to characterize all or most of Sahasat students. Tutoria is seen as a solution to this, that with a change in the social context and ways students participate with each other in class with their teachers and peers, they will “dare to show their opinions” (Line 9). Visions of change were centered in students

where a change in social contexts might help young people “dare” to speak, instead of how teachers calibrated progress and how they see Indigenous young people. This is problematic because speaking up and stating one’s own opinion is a competency that seems based on western forms of participation and performance. Tutoría as a way to further that continues to uphold western values and forms of participation rather than Indigenous ones and could be a form of continued colonization. Second, teachers’ deficit framings of students might not have shifted but hopes to change participation were attributed to the students’ social context (working with friends and peers) rather than teachers as the contributing factor of this change.

Teachers spoke of students’ social conditions as space to intervene in. Teaching and learning was for them, a way to impact problems of health and violence especially in Indigenous communities. It seemed that they saw Tutoría as a way to working towards building young people who could be future agents of change. Thus, similar to Kru Jan, Kru Surang and others talk about reciprocal relationships within pass-it-forward relationships; a teacher’s responsibility is to develop young people who then can be actors of change in their own worlds. At storywork event II, Kru Surang is the first person to offer up her stories to the rest of the group.

Storywork event II

1. After that I created a club for the kids, first I asked the students in the club if they
2. wanted me to help them in any area, or to teach them anything... The students told
3. me, “Teacher, I want to learn about food and needlework.” Instead of providing
4. them topics in advance, I learned to ask students first, then I could help them
5. and they also helped me. At the 60th anniversary of Sahasat, I got the recipe to
6. make “Bean chili paste” from the student, and then cooked it. It’s so good. That is
7. what I learned from my students. We gave to the students and then they also gave
8. back to us.

ตอนหลังมาครูเจตจัดชุมนุมให้เด็กๆ ครูจะถามเด็กก่อนว่าเด็กต้องการให้ครูช่วยเรื่องอะไรบ้างมัย บอกเรื่องอะไรบ้างมัย... บางที่เด็กบอก ครูอยากได้อาหารบ้าง อยากไ้ทำงาน ก็กับการที่เราเดาไปเรื่อยๆเราก้ถามเด็กก่อนว่าต้องการอะไร แล้วก้ช่วยเขา แล้วเขาก้มาช่วยเรา ตอนที่งาน ปีของสหศาสตร์60ครูเจตได้สูตรน้ำพริกถั่วลิสงของเด็กๆมา ก็มาตำ อร่อยเราก้ได้ถ่ายทอดจากเด็ก แล้วให้เด็กได้เห็นจากเรา

Heteroglossic as Invitations (Intervention to Invitations)

In describing her most memorable moment, Kru Surang talks about growing into listening to the heteroglossic, multi-voiced interests of her students. Her openness “first ask the students if they wanted me to help them...or to teach them anything” (Line 1-2) was an invitation for consensual, adaptive, and expansive learning relationships. It invitation for the multi-facted, multi-styled

student interests that expanded the scopes of possible “correct languages” available to young people at school (Bakhtin, 1981, p. 343). It seems that Kru Surang’s club based on her students’ heterogeneous interests expanded reciprocal co-design possibilities for students to build intellectually healthy learning environments through their own languages and knowledges.

This opening for heteroglossia was also a basis for students to be as reciprocal partners for teachers. Teaching was no longer a mono-directional process where teachers determined the content to be taught to students, the recipients. Kru Surang talks about how she “learned to ask students first” about what topics to teach so that “I could help them and they also helped me” (Line 4-5). Kru Surang then provides the example of a bean chili paste that she has learned from her students saying “this is what I learned from my students. We gave to the students and then they also gave back to us” (Line 7-8). Her story highlights the dialogic nature of reciprocal giving from within her Tutoría club, and a space for centrifugal forces to expand heteroglossia at school.

Heteroglossia as (Re)storying roles

Kru Noon (Karen), the academic head at Sahasat expands:

1. Tutoria can relate home and school together. Each student has various interests and
2. expertise. The teachers can be their helpers who find the skills or abilities of the
3. students [...] and the teachers might have seen something more from the students.
4. The attitudes of the teachers might have been changed. The teachers might have
5. changed their own views a bit; that is, from what we used to think that we are better than
6. them. So from now, we have to see them in a new way, that actually we are on the same
7. level of exchanging learning. However, it also doesn’t mean that students are all better
8. than teachers.

ทิวทอเรียสามารถเชื่อมโยงบ้านและโรงเรียนด้วยกันได้ เด็กแต่ละคนมีความสนใจ มีความเก่งที่หลากหลาย ซึ่งครูสามารถเป็นผู้ช่วยในการดึงศักยภาพของเด็กออกมาได้ [...] และครูคงเห็นอะไรจากเด็กมากขึ้นและมุมมองของครูก็จะเปลี่ยนอาจจะเปลี่ยนมุมมองของตัวเองไปนิดนึงจากที่เราไม่คิดว่าเราเก่งกว่าเขา แต่เราก็ต้องแบบมองเค้าใหม่แบบอยู่ในระดับเดียวกันแล้วสามารถแลกเปลี่ยนเรียนรู้ แต่ก็ไม่ใช่เด็กเก่งกว่าครูไปหมด

Designing with homelands and homelife – the relating of home and school together allowed for heterogeneity to grow in complexity across our design. Homelands are a place where “each student has varied interests and expertise” and this brought into school contexts seemed to have important implications for shifting power at school. First, listening to the heteroglossic voices and interests disrupted normative hierarchical relations of dominance between teachers and students. It prompted attitude changes in teachers where teachers “don’t think that we are better than them” (Line 5-6) and actually that “we have to see them in a new way, that actually we are on the same level of exchanging learning” (Line 6-7). There is a (re)storying of roles where teachers now try

to help “find the skills or abilities of the students” instead (Line 2-3). Kru Noon is clear that Tutoría does not however position students above teachers either (Line 7-8), but it is sharing power through mutual co-creation of knowledges across lands and knowledge systems.

Storywork I & II

Between storywork event I and storywork event II, Kru Surang seems to shift from thinking about education as an intervention to an invitation. Teaching and learning in Tutoría became less about training students to solve problems, it was additive to the lives of the teachers and students in reciprocal ways. It seems that instead of understanding teaching as powered interventions into the lives of children that are then passed on to others (to future students, to peers), teaching and learning was a dialogic and co-constitutive invitations where teachers learned alongside their students in more horizontal and humanizing teacher-student relationships. This, I suggest is a disruption of hegemonic teaching and learning relationships where deeply valuing heteroglossia at school required teachers to invite difference and be adaptive rather than characterize divergent interests, languages, and knowledge systems as deficit. I suggest that “learning to ask the students first” (Line 4) is a kind of attentive listening of teachers that implied a shift in the relational qualities at school as well.

Kru Noom

Kru Noom is another Karen educator who was in his fifth year as a teacher at Sahasat during Storywork event I. In the circle, he was one of the only teachers who brought up the importance of students’ homes and communities. He builds upon Kru Surang’s idea when he reflects upon what story he would like to tell of our design and work together. He expands this vision to the local wisdom that young people bring to school and the importance of inter-tribal learning and exchanges.

Storywork event I

1. I want students and children to be changed in the terms of what Kru Surang have just
2. said that is quality of their lives, their next steps in education, and they can go back
3. to their communities and continue developing their communities to step forward.
4. It is my passion.

อยากให้นักเรียนแล้วก็เด็กเนี่ย ได้รับการเปลี่ยนแปลงในเรื่องของ เมื่อก็คครูสุเจษบอกไปบ้าง ก็คือ เรื่องของชีวิต การศึกษา แล้วก็สามารที่จะนำไปสู่ชุมชนได้กลับไปพัฒนาครอบครัว ในชุมชนของตัวเองนะครับ ก็เป็นภาระใจนะ ครับ

At storywork event I, Kru Noom echoes what Kru Surang, and seems concerned with wanting “student and children to be changed” in the “quality of their lives” (Line 1-2). He extends this further, not just so they can solve problems (see Kru Surang’s story from event I on p. 59), but so they “can go back to their communities and continue developing their communities to step forward” While there is an emphasis on going back to homelands and communities, it is unclear what Kru Noom means by “step forward” (Line 3). It does however, imply that 1) young people have a responsibility to remember their communities and 2) that community development is dependent on young people’s improved quality of life through school and their “next steps in education” (Line 2). Similar to Kru Jan’s giving back across time, progress is seen as giving back across place. However, students’ goals to “continue developing their communities” is spatially unidirectional, from school to society to (Line 3).

Kru Beam in the circle also talks about how students have agency to create changes in society. She says, “I want to take what those teachers have left in me to teach students, so that they learn to think and have their own ideas, so that there is no discrimination in the society. Being able to think analytically matches with Tutoria because Tutoria emphasizes on thinking analytically.” Tutoria is seen as being able to transform the forms of thinking and analysis and provide cases to show that students from Sahasat can think at high levels. 8 out of the 17 teachers within the group envision that school can and should contribute to home, community, and societal development and improvement. Development in these narratives however, are largely understood on similar terms of narrow constructions of modernity, instead of from within Indigenous knowledges and lifeways.

Storywork event II

1. I would like to tell about the system of teachers and students in Tutoria Relationship.
2. In the future, the various local wisdoms or tribal knowledges should be shared and
3. exchanged among different tribes by using our Tutoria system so that the students can
4. understand and have knowledge. They can be proud, understand, and be united. They can
5. live together in the society and have knowledge, understanding, and happiness.
6. So, Temas (lessons) of the teachers and students at school should cover (everything)
7. completely. I think it is a growing opportunity to develop sustainably in the future.

อยากจะบอกถึงความมีระบบของนักเรียนและคุณครูในการเรียนรู้ในระบบทิวทอเรีย ในอนาคตน่าจะนำหลักความรู้หรือภูมิปัญญาชาวบ้านหรือความรู้ของชาติพันธุ์ต่างๆ อยากให้เกิดการแลกเปลี่ยนกันระหว่างชนเผ่า โดยใช้ระบบการติวของเรา นักเรียนจะได้เข้าใจและเกิดความรู้ ความภาคภูมิใจ เข้าใจ และเป็นน้ำหนึ่งใจเดียวกัน อยู่ร่วมกันในสังคมได้ อย่างมีความรู้ ความเข้าใจ และมีความสุขครับ (ตั้งนั้นเต็มมา) Tema ของครูและนักเรียนในโรงเรียน ควรจะจัดเต็มในประมาณนี้ครับ ครูมองว่ามีโอกาสเกิดขึ้นและพัฒนาได้อย่างยั่งยืนในอนาคตครับ

Heteroglossia as Tribal Exchanges

In storywork event II, Kru Noom talks about how “various local wisdoms or tribal knowledges should be shared and exchanged among different tribes” (Line 1-2), with Tutoría as a way to surface this multiplicity. He qualifies that these knowledges are different and varied and that it is within that multiplicity, that “students can understand and have knowledge” (Line 3-4). He uses “ภูมิปัญญาชาวบ้านหรือความรู้ของชาติพันธุ์ต่างๆ” to refer to knowledges and practices from the village and then specifies knowledge and practices from ethnic/ tribal groups. Kru Noom uses the word “should” to extend this idea by explaining how *through* the unique knowledges that each young person brings from their family and tribe, reciprocal exchanges of learning across tribes at school could further “knowledge, understanding, and happiness” (Line 5). In Kru Noom’s opinion, designing for and attention to heteroglossic stories, languages, wisdoms, and practices from different tribes is the grounds by which new relational forms of knowledge can emerge.

Heteroglossia as Pride and Unity

Kru Noom also finds that learning from within reciprocal relationships across tribes might be part of facilitating cross-tribal unity. He says that through such exchanges, students “can be proud, understand, and be united” and “live together in society” (Line 4-5). The feeling of unity in Thai, literally, is to be of one heart (เป็นน้ำหนึ่งใจเดียวกัน). Kru Noom suggests that expansion and cultivation of centrifugal forces that takes into consideration everyday heteroglossia of life has implications on how we treat each other and find unity across distinct languages, knowledge systems, and practices.

Heteroglossia as Sustainable Development

Finally, Kru Noom ends with the hope that the Temas – the lessons that are used in Tutoría – can be ways to cover everything that one would need to “develop sustainably in the future” (Line 7). He uses the word “ยั่งยืน” for sustainability. If we draw upon tribal wisdom, learning is no longer about simple “development” but in a way that is balanced and sustainable for the future, an important aspect of Indigenous knowledge from home that are often distinct from those in school. What is hinted at here is Kru Noom’s desire and sensibility to keep Indigenous axiological groundings and responsibilities as a central guide to live and develop in a sustainable way.

Storywork event I & II

In comparing storywork event I and event II, Kru Noom shifts in seeing home and community as a spaces to be “developed” or stepped forward, but as places to draw upon local wisdom and that could be also brought into school. This suggests a disruption of knowledge hierarchies involving colonial logics of modernity that are ever present in state school curriculum, as well as hierarchies among tribes. Kru Noom shifts from seeing the role of school to help develop a “better quality of life” for tribal young people and their communities, to seeing schools as a place that can facilitate inter-tribal learning. His story in the second event implies that young people in fact have wisdom and knowledge to share among the tribes that could move their own communities forward. Furthermore, implicit in Kru Noom’s story is that tribal knowledges place emphasis on development in a sustainable way with the natural world. Heteroglossia at school is an opening to centralize tribes’ axiologies around development in a good way, development that ensures the long-term sustainability for tribes and community futures at school. Sustainable ways forward is still distal and removed from settled knowledges at school that are predicated on production and consumption. While not explicit, Kru Noom suggests that designing schools towards heteroglossia across tribes has could help make ecologically sustainable futures more central to the work of teaching and learning at school through the inclusion of Indigenous knowledges. Kru Noom’s design is a desire “otherwise separate” stories, a deeper listening to them so that teachers, students, and families can to “be proud, understand, and be united” as a collective (Line 4) (Million, 2011).

I now turn to two other ways that heteroglossia was taken up that has not been mentioned yet from Kru Noon, (Karen), the academic head at Sahasat.

Heteroglossia as Movement Building through Storywork

1. One, I want other people to touch Tutoria learning. I want them to see and experience that
2. students have their potentials which some adults cannot think of. Two, I want other
3. people to pay attention and change their mindset of learning to think that learning should
4. be parallel to making good relationships among one another. They should not focus only
5. on learning achievement results. Three, the policy of education leadership should truly
6. relate home or family to education at school. The goal of education should aim to
7. improve children’s abilities and this can start from children’s homes or communities
8. which are in reach of children and where they have grown up from such environment.
9. Education should enhance and sustain children’s learning.

หนึ่ง อยากให้บุคคลอื่นได้สัมผัสการเรียนรู้ผ่านการถ่ายทอดแบบทิวทอเรีย อยากให้สัมผัสกับเด็กๆ ที่เขามีศักยภาพในตนเองที่ผู้ใหญ่อาจคิดไม่ถึง

สอง อยากให้บุคคลอื่นได้สนใจและเปลี่ยนมุมมองด้านการเรียนรู้ว่าควรควบคู่กับการให้เด็กสร้างปฏิสัมพันธ์ที่ดีซึ่งกันและกัน ไม่ได้มุ่งหวังเรียนรู้เพื่อผลสัมฤทธิ์เพียงอย่างเดียว
 สาม อยากให้นโยบายของการจัดการศึกษาเชื่อมโยงบ้านหรือครอบครัวกับการศึกษาในโรงเรียนได้อย่างแท้จริง
 อยากให้การศึกษามีเป้าหมายเพื่อพัฒนาศักยภาพของเด็กๆ โดยเริ่มจากที่บ้านและชุมชนของเด็ก ซึ่งเป็นสิ่งใกล้ตัวและเด็กๆ และเข้าเติบโตมาจากสภาพแวดล้อมเหล่านั้น การศึกษาควรช่วยเสริมสร้างและต่อยอดการเรียนรู้ของเด็กๆ

Kru Noon here speaks of three dreams she has to build and grow the Tutoría work. First, she wants others to “touch Tutoría learning. I want them to see and experience that students have their potentials which some adults cannot think of” (Line 1-10). Within these sentiments is a desire to for others to have affective, felt experiences of storywork so that they might “touch” a relational kind of learning and shift what adults imagine to be possible at school.

Second, building towards these new imaginaries seemed to be fueled by “making good relationships among one another” (Line 4). Previously enclosed by educational measurement objectives, Kru Noon here offers that relational transformations are both the vehicle and substance of change that should be measured instead. She says, “they should not focus only on learning achievement results” but “change their mindsets” to change the student-student, student-teacher, and teacher-teacher relationships. In a way, state level educational measurement loses its strongholds on schools through renewed relation-focused activity. The nation-state is held up by these measurements and refocusing teaching and learning helped teachers at Sahasat disrupt being defined and enclosed by these narratives.

Heteroglossia as Starting from Home

Finally, Kru Noon shows that heteroglossia that start from home facilitates social dreaming. powered constructions of knowledge hierarchies and colonial modernities at Sahasat also seemed lose power while attention to heteroglossia simply “can start from children’s homes or communities which are in reach of children” (Line 8), a kind of storywork from home. Kru Noon extends this to educational leadership and how it should “truly relate home or family to education at school” where education “should enhance and sustain children’s learning” (Line 16-17) across these spaces. Such spatial transformation across home and school is antithetical to the nation-state.

In comparison to Kru Noon who at storywork event I, said “One thing that I don’t like it at all – whoever says that Sahasat is bad, the teachers are not good, the students are stupid,” she finds

strength to hold onto what resonates with her in educational leadership – student potentials, relationships and stories from homelife as new shared horizons for learning at Sahasat.

3.4.1 *Summary of storywork events I & II: Conditions for Social Dreaming*

At storywork event I, amidst feelings of domination and oppression, it seemed that teachers spoke of hope and beginning threads of social dreaming together where there was a joint orientation to a pursuit of new horizons (Espinoza, 2008). This was seen through teachers' narratives of students who, in their eyes, carried the potentials for actors of change with their peers in school life and in the hostels, for their families and communities, and to prepare and solve the challenges of living as an Indigenous person in dominant Thai society.

Furthermore, as teachers placed themselves in relation to others in the circle (former students to teachers), social dreaming here largely carried narratives of reproduction. For example, hopes for students were mirrored in the eight current teachers within the circle who were also former students in Sahasat. Such stories seemed to inspire each other as veteran teachers saw the living proofs of their labor, former Sahasat students, who were now teachers at the school. Thus a feasible pathway for change was to do the same for yet others in the future. Reciprocity existed within such reproduction through passages of time. The mirroring of intergenerational reciprocal learning and teaching relationships across time were apparent among these group of teachers and it was with this kind of dreaming that we moved forward the work at Sahasat school.

At storywork event II, it seems that the object of joint orientation in the Tutoría teachers' social dreaming shifted from storywork event I. There was a “partial discarding of now-inadequate objectives and motives, a fashioning and pursuit of new horizons” to now focus on instructional designs that re-mediated normative roles of school and home, of “teacher” and “student”, (Espinoza, 2008, p. 45). Reproducing the same pathways for young people now seemed inadequate for teaching and they seemed more concerned with creating connections, storytelling and storylistening with each other across the landscapes of home and school.

Designing schools to account for and expand heteroglossia through storywork in these multiple ways was humanizing. Teachers began to see students differently, and began to see home differently. While these stories were told by teachers, teachers vision for collectivizing at school explicitly included young people and families as part of this work. 11 out of 17 teachers at storywork even II mentioned the explicit need to design with families because home contributed

to the intellectual vibrancy of school. Storywork within and across teachers and students have profound implications for who teachers imagined who children and families could be, and also made visible collective desires for expanding heteroglossia through the participation of students and families as necessary actors in change making at school (A. M. Ishimaru et al., 2019). Becoming better storylisteners to young people and families carry potentials to disrupt normative power hierarchies typical of work across home and school to include community and family in the design work at school.

3.5 DISCUSSION AND IMPLICATIONS

3.5.1 *Storywork and Social dreaming*

This paper builds on previous scholarship that has found stories central to learning, becoming, and building pathways to Indigenous futures (Archibald, 2008; Archibald, Lee-Morgan, & De Santolo, 2019; Bang et al., 2014; Barajas-López & Bang, 2018; Brayboy, 2005; Marin & Bang, 2015). The teacher stories presented here extends this work to illustrate the ways (1) storywork at school has relational, ethical, and political implications and collectivizing impacts, (2) stories, heteroglossia and social dreaming are interrelated and (3) storywork can be a way to understand the evolution of participatory design research overtime. Being in story with each other seemed to surface alternate imaginaries of learning and education and strengthened our resolve to design towards communities' collective continuance in increasingly heterogeneous ways. These stories illustrate both how teachers took up everyday heteroglossia in teaching and learning with their students and with other teachers through Tutoría These multiple stories also show how teachers took up Tutoría towards various ends, and how our design grew because of it. Living in ethical, consensual relationships did not just happen at the level of instructional practice but was mirrored and prefigurative in how teachers iterated on the design in ways that mattered to them (Vossoughi & Booker, 2017; Yates, 2015). How we ethically and politically engaged with each other in interaction, mattered for the broader change we desired to see within schools and communities – it was the transformation itself. Repairing and re-making relations between students and teachers with heteroglossia also re-made larger systems of relationships that were openings to strengthen teachers' and students' collective capacities to thrive and be resilient in the face of neoliberal and

capitalistic demands within school systems (Whyte, 2014). It helped us to social dream in heteroglossic ways that resonated with our own places, histories, and contexts.

Scholars have called for increased attention to the axiologies of learning, an attunement to the ethical so that we can further understand, theorize, and find new methodologies to analyze, amplify, and sensitize us to how we engage with ethics and politics in the design of learning environments (Bang et al., 2015; Vossoughi et al., 2018). My friends' stories demonstrate how transforming teacher-student relationships to take seriously children's heterogeneous lives and interests has political implications. Renewed axiological responsibilities to taking seriously heteroglossia, reciprocity, and relationships at school disrupts powered expertise relations at the level of teacher-student, at the level of colonial logics so that other possible futures, Indigenous possible futures could be illuminated. Re-storying relations made visible the ethical and political dimensions of their work where state-mandated directives lose power while other possibilities, such as family and community futurities, gained power and purpose.

While this paper does not explore how teachers' stories build upon or "go into the stories themselves" (p. 134), I suggest that storywork with one another allowed for different ways of being together and the role of stories in social change making in both micro-affective worlds and the larger world of school. Stories renewed connections and held space for teachers to enact new relational positionings of power between and within teachers, students, and families. As Kru Chuti mentions when reflecting on our first storywork event, "throwing a string and making a Sahasat Tutoria web: this makes me impressed that working is teamwork, it's not working alone[...] is good is that we have been together." Stories are epistemological, ontological, and axiological openings that facilitated the ways in which teachers and I reinvigorated our purpose and their pedagogical imaginings of what is possible at school. Stories taught and reminded us "the importance of why you do something, why you do things a certain way" (Archibald, 2008, p. 81). To these ends, an important purpose of this paper for me was to "keep the stories alive" for my friends at Sahasat (Archibald, 2008, p. 81).

3.5.2 *Design Implications: Stories and Heteroglossia in Design & Teacher Education*

Relationality is increasingly a key explicit object of analysis in design-based research, particularly in community-based and participatory design research (Bang et al., 2015; Bang & Vossoughi, 2016; Booker & Goldman, 2016; Vossoughi & Gutiérrez, 2014; Zavala, 2016, 2018). This paper

adds to this growing body of literature to highlight how stories may carry important affective and transformative potentials for both (a) maintaining and advancing healthy epistemic, ontological, and axiological heteroglossia, and (b) unifying and collectivizing movements for social change-making in colonized spaces such as school. Heteroglossia in design draws on both centrifugal and centripetal forces where stories and storywork help build “open ended social innovations” that also hold collectives together across multiple times, roles, and levels of the activity system (Booker & Goldman, 2016; Engeström, 2011, p. 602). Storywork and heteroglossia in design may offer fundamental insights into how re(storying) relations at the most basic unit of a system (e.g. teacher-student relationships), has implications for our own self-understanding and willingness to learn (Gadamer, 2004), and subsequently for how we then began to impact lateral relationships (teacher-teacher) for collective change-making in teacher learning and development.

The incredible resilience of Indigenous communities has always continued to maintain and advance their own knowledge systems, ethical intelligence, and ways of being (M. E. Bang, 2009; Cajete, 1994; Deloria Jr. & Wildcat, 2001; Kawagley, 1995; Prasit & Meixi, 2018; L. Simpson, 2011; wa Thiong’o, 2008). Yet schooling has been persistent in ignoring the rich family-based knowledges that young people bring into classrooms debilitates the intellectual health of schools (Rosebery et al., 2010). At a global level, this structures the loss of human diversity through global epistemicide (Santos, 2014), turning us into an “imbalanced species that justifies violence to our planet and to others” (Belcourt, 2018, p. 117).

As we continue to reach for participatory learning designs that are consequential for families and communities and (Gutiérrez & Jurow, 2016), it is clear that we are at a critical point in schooling and human history. We can either continue to enact violence and dispossess children from lands and their home knowledge systems through Western forms of schooling (Battiste, 1986, 1998; Marker, 2003; Olson, 2009) or find ways to repair such fragmentations and re-mediate relationships towards more just and sustainable forms of life. Such re-mediations could move us closer to scaling relationality, a critical and expansive forms of relationality that refuses settler forms of kinship (Booker, 2019; Tallbear & Willey, 2019). We are desperate for points of connection when navigating the worlds of school and home a “place of generativity, rather than a place of reified histories defined by dominance” (Bang, 2009, p. 184). This paper suggests that stories, many stories might help us do some of this work – where listening and telling stories to each other is one of the most radical things we can do.

ARTICLE 2

Chapter 4. STORYWORK OF HOME: MATHEMATICS FROM WITHIN FAMILIES' AXIOLOGICAL GROUNDS

“According our beliefs, the belief that if we bring him (grandfather) and bury him here, he will help look after the garden.”

Ti, 15 years old
Hmong Village of Huay Mae Pao
หมู่บ้านห้วยแม่เปา

4.1 INTRODUCTION

Mathematics is often held as untouchable, rational, objective, logical (Ascher, 1994; D’Ambrosio, 2009; Joseph, 1997; Nelson-Barber & Estrin, 1995). Yet, mathematics has been long intertwined in extractive-assimilative logics that further political, economic, military and industrial complexes that continue to ravish bodies and allow violence (D’Ambrosio, 2009). It is a discipline often infused with normativity, understudied in Indigenous contexts, and also a site of resistance and struggle (Knijnik, 2002). What is a “mathematics” from distinct axiological grounds?

While there currently is no agreed-upon definition of mathematics, for purposes of this paper, I consider mathematics as practices involving patterns, quantities, measurements, rhythms, space, and relations (Aikenhead, 2018; Civil, 2007; D’Ambrosio, 2006; Lipka et al., 2005; Lloyd et al., 2016). This paper explores mathematics within family life, in particular from important family places and land-based subsistence practices in Thailand. With two exploratory case studies and family walks with a Hmong and Lanna Thai family in Thailand, I illustrate how mathematics emerges from and exists within families’ axiologies – or their “ethical frameworks that guide how we live and be in relation with others” (Coulthard, 2014 as cited in Simpson, 2017). These ethical sensibilities guide how we understand our roles and responsibilities to family and community, and how to live with lands and with others.

The two family walks in this paper are part of a larger participatory design research study based in an urban Indigenous school in Thailand called Sahasat that engaged Indigenous young people, their teachers, and families across the landscapes of home and school (Bang & Vossoughi,

2016). For purposes of this paper, I use the word landscapes to refer to both the physical geographic space and also the stories, ethics, practices, philosophies, ethics, relations (past, present, future with humans and more-than-humans), teachings, and ways of being of that place.

This paper comes from our¹⁸ second year at Sahasat, during a key point of evolution where we designed to walk and story homeland villages with six Indigenous young people and their families (Bang et al., 2014; Marin & Bang, 2018). This point in our design was significant for us because it laid the foundations for teachers and students to begin design with homelands at school in Year 3 (I explore this event in Article 3).

The learning sciences has long been concerned with making visible the ways that home is a site of intellectual, relational, and ethical work (Bang et al., 2014; Gonzalez, Moll, & Amanti, 2005; Gutiérrez & Rogoff, 2003; Gutiérrez, 2008; Heath, 1983; Ochs & Capps, 2002; Paris & Alim, 2017; Rogoff, 2003; Taylor & Hall, 2013). Using sociocultural understandings of learning, I explore the ways in which mathematics is cultural, interwoven within broader family and community relationships and responsibilities. Situated and sociocultural theories of learning are useful because they make visible how humans make meaning by participating in constellations of cultural practices that are dynamic, contested, varied, and situated in sociohistorical contexts (Cole, 1996; Engeström, 2001; Gutiérrez & Rogoff, 2003; Lave & Wenger, 1991; Lee, 2008; Rogoff, 2003; Vygotsky, 1978; Wenger, 1998). They help us see how meaning-making occurs within microlevel interactions, movements within and across spaces, and macrolevel systems of policies and beliefs as people shape, and are shaped by participating in situated and historical constellations of cultural practices (Bang, 2015; Cole, 1996; Engeström, 2001; Gutiérrez & Rogoff, 2003; Lave & Wenger, 1991; Lee, 2008; Nasir, Rosebery, Warren, & Lee, 2006). The cultural historical activity systems that families participate in, also reflect particular epistemic, ontological, and axiological orientations (Bang, 2015). In other words, family activity systems (and their mathematics practices) reflect their ways of knowing, being, and understanding what is right, good, and beautiful (Bang, 2015; Bang, Faber, Gurneau, Marin, & Soto, 2015; Cole, 1989; Gutiérrez & Rogoff, 2003; Lee, 2008; Rogoff, 2003; Vygotsky, 1978).

¹⁸ I speak of this design as “ours” to include the academic head at Sahasat, Amornrat Pinwanna other lead team members, Sukanda Kongkaew, Panthiwa Theechumpa, and Alison Ling, and the other teachers at Sahasat school.

4.1.1 *Families' Axiological Grounds through Land & Story* ศีลธรรม or วิถีปฏิบัติ

Our axiologies – our value systems, who we understand ourselves to be and our capacities to know – is emergent from lands and encoded in stories (Archibald, 2008; Brayboy, 2005; Bang et al., 2014; Cajete, 1994; Ingold, 2010; Marin & Bang, 2018; Simpson, 2017; Styres, 2017; Tuck, McKenzie, & McCoy, 2014). Ingold (2010) writes “Without the ground, we would lose much of our capacity to know (Ingold, 2010, p. 135 as cited in Marin & Bang, 2018). For this paper, I use axiologies to refer to families’ underlying worldviews and value systems that guide of how they understand what is good, true, right and beautiful in how to be in the world (Bang, Faber, Gurneau, Marin, & Soto, 2015; Brayboy, Gough, Leonard, Solyom, & Roehl, 2011).

Lands hold and sustain associated practices, stories, knowledges, values and ethics that make a family and community know who they are as a people (Armstrong, 2007; Bang et al., 2014; Goeman, 2008; Simpson, 2017; Styres, 2017), and who they are in relation with - including plant relations, animal relations, human family and community relations, ancestors, relations, and the spirit world. Axiologies are intimately linked to land and their associated practices – “our practices code and reveal knowledge, and our knowledge codes and reveals practices” (Simpson, 2017, p. 22). From Indigenous perspectives, these guiding dynamic axiologies are also our stories, the theories and teachings about how to be in the world (Archibald, 2008; Bang et al., 2014; Brayboy, 2005). Stories emerge from, reveal, and encode families’ axiologies; their guiding value systems are based in nuanced contexts and relationships with lands and each other. By walking and storying lands with families, I pay attention to how mathematical practices are interwoven within each families’ stories, their land-based axiologies and systems of relationships. For example, patterns or measurements practices can carry broader axiological commitments to relationships and responsibilities within a family and community.

This paper adds to a growing body of literature focused on political and ethical dimensions in learning that sensitizes us to axiological dimensions of sociocultural activity and human development (Bang, Faber, Gurneau, Marin, & Soto, 2015; Bang & Vossoughi, 2016; Booker, 2016; Booker, Vossoughi, & Hooper, 2014; Esmonde & Booker, 2016; Gutiérrez & Vossoughi, 2010; The Politics of Learning Writing Collective, 2017; Vossoughi, Jackson, Bang, Warren, & Rosebery, 2018). As we walked and storied lands with families (Marin & Bang, 2018), I focus on how families participate and narrate important subsistence practices like ricing and mango

harvesting on lands and the mathematics embedded within that. Understanding how mathematics is emergent from larger systems of relationships could add to current scholarship that challenges colonizing and dehumanizing views of mathematics and advances a radical re-envisioning of our discipline (Gutiérrez, 2007; Gutiérrez, 2017; Gutstein, 2009; Martin, 2009; Nelson-Barber & Estrin, 1995).

The following questions guide this exploration.

4.1.2 *Research Questions*

1. What mathematical practices emerge as families walk and story important places and practices in their community?
2. How is mathematics interwoven (or not) into families' axiologies as they navigate and participate in social and economic activities across the landscapes of home and school?
3. Through self-reflection, in what ways did I/we, as outsiders, participate to "see" mathematics with families on these walks?

4.1.3 *Our Design Context*

Sahasat school sits within this nexus of sociopolitical relations and cultural flows (Appadurai, 1996; Nesper, 1997). It is a K-12 private welfare school located in Chiang Rai city¹⁹ with a student population of about 2600 young people and 100 teachers. Sahasat's students come from 13 different ethnic groups and tribes: Akha, Lahu, Karen, Hmong, Lisu, Yao, Chan, Thailue, Lawa, Chinese, Khmu, Plang, and Northern Thai, from around 300 different villages across Chiang Rai province. Because of this distance, in 2019 around 57% of their students across Primary 1 – Secondary 6 (Grades 1 – 12) reside in 59 different youth hostels for around nine months out of the year, away from their homelands, families, and communities (Sahasat, personal communication). Students often return home once, if not twice a year to their families.

Our initial design politic at Sahasat school was focused on transforming powered colonial relationships in schooling to ones of freedom, reciprocity, and respect through a pedagogical

¹⁹ Chiang Rai is both a city and a province. Sahasat school is located in the Chiang Rai city and many of the young people come from surrounding villages in Chiang Rai and Chiang Mai province.

system of learning called *Tutoría* (Cámara, 2003; Rincón-Gallardo, 2019; Rincón-Gallardo & Elmore, 2012). *Tutoría* intervened in teaching and learning to transform subject-subject-object relations. Here subject-subject-object relations refer to student-teacher relationships in the presence of an object of joint attention, often a lesson topic and working through it mutual co-created dialogue, reflection, and moving across place to share learning with others in the network and community (Cámara, 2003; Rincón-Gallardo, 2019; Rincón-Gallardo & Elmore, 2012).

These transformed teaching and learning relationships led us to expand our design politic to repairing the fragmentations, policies of selective integration, and cultural assimilation that Thai public schooling has structured across the landscapes of home and school, particularly for Indigenous young people (Kwanchewan & Prasit, 2009; Vaddhanaphuti, 2005). In Thailand, state actions towards highland Indigenous peoples in particular are based on the assumption that their values, cultures, and knowledge systems are “obstacles to development” (Vaddhanaphuti, 2005, p. 163). In fact, fragmentation of school and home life is prolonged, desirable, and encouraged where separation from land and family is helpful in broadening participation in the “modern and superior present” in the dominant Thai society (Kwanchewan & Prasit, 2009; Vaddhanaphuti, 2005). Thus designing with homelands goes against structures of compulsory state education that have otherwise been historically complicit in constructing narratives of Indigenous erasure and devaluation of family and community life (Keyes, 2008; Keyes, 1991; Kwanchewan & Prasit, 2009; Vaddhanaphuti, 2005). In this schooling context, zero-point epistemology – which denies all other forms of knowing where only one singular perspective can exist, is still acceptable and widespread (Mignolo & Tlostanova, 2006). Thus in year two we expanded our design to take seriously Indigenous children’s diverse interests and full lives, especially their home lives and axiologies. It is in this context that we designed to physically enact connections home by walking and storying homelands with these six young people and families.

4.1.4 *Purposes and Goals of This Paper*

This paper broadens our understandings of mathematics and how it is interwoven within family and community life. It aims to make visible the ways that mathematics has been embedded in larger systems of relationships that was meaningful and resonant with families. Mathematics is part of community practices, knowledges, and responsibilities (Barajas-López & Bang, 2018a). I

suggest that grounding mathematical practices within larger systems of relationships challenges dominant extractivist mathematical paradigms that continue to assimilate nondominant communities into colonial logics. Understanding mathematics within its multiple systems of relationships it might offer us educators a way to radically shift how we do mathematics and why (Gutiérrez, 2017; Phillip, Bang, & Jackson, 2018). It could help build out generative, restorative forms of mathematics that contribute to a community's collective continuance – the ethical commitments that inform a community's ability to self-determine how it adapts to change to ensure that their lifeways flourish into the future (Whyte, 2014, 2017) and “a positive relationship between mathematics, people, and the globe” (Gutiérrez, 2007, p. 38).

4.2 WHY MATH? A REVIEW OF COMMUNITY MATHEMATICS SO FAR

As discussed earlier, learning is cultural and culture then, is far from ‘box models’ but are lived in human carriers as they participate in sociohistorical practices and cultural activities across contexts, maintaining regularities through jointly shaped goals (Bang, 2015; Cole, 1989; Engeström, 2011; Engeström, 2001; Gutiérrez & Rogoff, 2003; Gutiérrez, 2008; Lave & Wenger, 1991; Lee, 2002, 2017; Nasir, 2002; Nasir et al., 2006; Rogoff, 2003; Saxe, 1999). Humans and meaning-making are thus dynamic and contested; they shape and are shaped by moment-to-moment interactions and macro-level structures and systems of power (Bang & Vossoughi, 2016; Cole, 2012; Esmonde & Booker, 2016; Gutiérrez & Vossoughi, 2010; Lee, 2012). Mathematical practices, activities, and ideologies are also shaped by dynamic sociocultural activity and deeply entangled with power (Baker, Street, & Tomlin, 2003; Booker & Goldman, 2016; Gutiérrez, 2017; Martin, Gholson, & Leonard, 2010; Nasir & McKinney de Royston, 2013; Nelson, 2015; Shah & Leonardo, 2016; Yasukawa, Rogers, Jackson, & Street, 2018).

Mathematics as a settled, colonial discipline within broader interlocking systems of oppression and violence (D'Ambrosio, 2009; Gutiérrez, 2017) is increasingly being overturned by scholars-educators who:

- a) question the historical roots of mathematics (Gutiérrez, 2017; Joseph, 1997; Joseph, 2011; Powell, 2002) and from alternative logics called *ethnomathematics* (Ascher, 1994;

D'Ambrosio, 2006; Eglash, 2000, 2007, 2009; Gerdes, 1994; Sizer, 2000; Verran, 2000b, 2000a)

- b) recognize community and homelands as sites of deep intellectual mathematical work that refuse school-home binaries (Aguirre & Zavala, 2013; Aikenhead, 2018; Archibald, Nicol, & Yovanovich, 2019; Carraher, Carraher, & Schliemann, 1985; Civil, 2007; Civil & Andrade, 2002; Lave, 2011; Lipka, Andrew-Ihrke, & Yanez, 2011; Lipka et al., 2005; Nasir & Hand, 2008; Nelson-Barber & Estrin, 1995; Nicol, Archibald, & Baker, 2010; Saxe & Esmonde, 2005; Taylor, 2009).

These two broad strands necessarily overlap to build our mathematics from distinct axiologies. I briefly describe each one.

4.2.1 *Ethnomathematics*

A body of literature studying mathematics in community has come under the umbrella of ethnomathematics (D'Ambrosio, 1997, 2016). In this growing body of research in ethnomathematics, scholars are seeking to find a different center or more explicitly, a non-Eurocentric base (Joseph, 1997; Verran, 2000b). Through studies across various Indigenous communities from Oceania (Diaz, 2011; Sizer, 2000) to Africa (Zambia, Cameroon (Eglash, 1999), Mozambique (Gerdes, 2011), and others (Zaslavsky, 1999), there have been various efforts at making mathematical practices visible within family and community life and broaden what we currently define, understand, and see to be mathematical (Ascher, 1994; D'Ambrosio, 1997, 2016; Eglash, 2000; Gerdes, 1994; Lave, 2011; Sizer, 2000; Verran, 2000b). Particularly recent has been studies at the intersection of mathematics in cultural and community contexts (Baker et al., 2003; Beach, 1995; Cole, 2008; Nasir, 2002; Saxe & Esmonde, 2005; Street, Baker, & Tomlin, 2005; Taylor, 2009; Yasukawa et al., 2018), ethnomathematics (Ascher, 1994; D'Ambrosio, 1997, 2016; Eglash, 2000; Gerdes, 1994; Verran, 2000b) and Indigenous mathematics and culturally responsive mathematics education (Archibald et al., 2019; Barajas-López & Bang, 2018b; Barta, Brenner, & Frankenstein, 2009; Civil, 2007; Eglash, 2009; Lipka et al., 2011, 2005; Lloyd et al., 2016; Moschkovich & Nelson-Barber, 2009; Mukhopadhyay, Powell, & Frankenstein, 2009; Mukhopadhyay & Roth, 2012; Nicol et al., 2010).

4.2.2 *Mathematics in Community Contexts*

Mathematics is increasingly understood as integral parts of constellations of cultural practices with important connections to identity and mathematical goals (Jackson, 2009; Martin, Gholson, & Leonard, 2010; Nasir, 2002; Nasir & Hand, 2008; Nasir & McKinney de Royston, 2013), participation in family and community life (Civil, 2007; Lipka et al., 2011, 2005; Owens et al., 2011; Saxe & Esmonde, 2005) and for critical “reading the world” as people are trying to solve problems in the world (Barta et al., 2009; Frankenstein, 2005). Ascher (1994) in fact posits that the very separation and abstraction of “mathematics” is a Eurocentric and is not endogenous to many communities. This is not to mean that mathematical ideas or concepts about patterns, observation of shapes, relationships, numeracy, or space is not present in varied ways; “rather that others do not distinguish them and class them together” (Ascher, 1994, p. 3) as disconnected from other practices or relationships.

However, little attention within ethnomathematics and/or culturally responsive mathematics interrogates the ways in which educators, outsiders, and visitors to homelands (with a focus on critiquing myself) can and might continue to “miss the point” and slip into extractivism-assimilative processes in the design of mathematics curriculum from homes and community spaces. Movements that making families’ funds of knowledge increasingly visible can reproduce extractivist-assimilative mindset where lands, bodies, and minds are again purposed towards state-defined ends of schooling and narrow definitions of ‘development’ and ‘modernity’. To these ends, I take up vulnerable observation (Behar, 1996) as a dimension of analysis in this paper.

4.2.3 *Intellectual Extractivism & Mathematics*

Colonization and capitalism are founded on and seek to perpetuate the twin forces of extractivism-assimilation where lands, bodies, plant and animal relatives are resources to be used to further entrench strongholds within colonialism and capitalistic control (Klein & Simpson, 2017). In an interview with Naomi Klein, Leanne Simpson (2017) reinforces that the extractivism mindset removes relationship, extractivism removes meaning, it is a stealing that happens without consent or dialogue, or the recognition of that holders of these knowledges are intelligent, living, breathing people and nations. Intellectual extractivism has happened with the appropriation of technologies like the canoe or kayak, where “any technology that we had that was useful was extracted and

assimilated into the culture of the settlers without regard for the people and the knowledge that created it.” This is done in an extractivist-assimilationist way where there is little regard for the land, context, consent, and relationship by which these grounded normativities emerge, nor on the terms of Indigenous people (Klein & Simpson, 2017).

Intellectual or cognitive extractivism – the taking of what is deemed good for continued assimilation into state-defined and capitalist goals has long been a foundation in mathematics and mathematics education (D’Ambrosio, 2009; Gutiérrez, 2017). Mathematics as many of us know it is based from stolen knowledges from non-Eurocentric communities (Eglash, 2007; Joseph, 1997).

At one level, extractivism in mathematics has been perpetuated by both the stealing and erasure of the contribution of Indigenous, African, Chinese, Indian, and Arab intellects (and many others) to the evolving field of mathematics. This is evidenced by the stealing of foundations of computing by Bamana people’s sand divination practices (pseudorandom number generation) from the 12th century, the development of zero by the Mayans, and algebra by the Egyptians and Babylonians (Eglash, 2007; Joseph, 1997; Powell, 2002). This failure to recognize the diverse history of mathematical ideas is typical of mathematics classrooms and where mathematics is often held as untouchable, rational, objective, logical but yet deeply involved in interlocking political-economic complexes (Ascher, 1994; D’Ambrosio, 2009; Joseph, 1997; Nelson-Barber & Estrin, 1995). On another level, extractivism-assimilative mathematics, stripped of its heterogeneous axiological grounds within distinct communities, has been re-packaged to operate as whiteness and become oppressive to those very same Indigenous and nondominant communities.

Because “concerns about what mathematics is are generally the domain of philosophers and the historians who write its history” (Ascher, 1994, p. 3), we need expanded decolonial constructions of mathematics and a radical re-envisioning of this discipline (Gutiérrez, 2017). I suggest that within this expansion, it will be important to consider mathematics from within families’ land-based axiologies and broader systems of relationships. Understanding mathematics within its axiological grounds refuses the subordination of Indigenous mathematics to Eurocentric ones; it disrupts deficit framings that assume Indigenous people’s mathematical contributions are less complex or sophisticated, lacking the epistemic authority and ability to contribute to the field of mathematics in a real way (Barajas-López & Bang, 2018; Booker & Goldman, 2016; Nelson-Barber & Estrin, 1995; Powell, 2002). It disrupts the re-colonialization of communities through mathematics as co-constructed within other relations and practices and a necessary part of

establishing reconnections to practices, lands, and responsibilities (Barajas-López & Bang, 2018; Gutiérrez, 2007). This could help build alternative forms of math that “influences us and our relationships with others in the universe” that hold meaning for families and communities (Gutiérrez, 2017 p. 14)

4.2.4 *Indigenous Mathematics from within Families’ Grounded Axiologies as Alternatives to Extractivism-Assimilation*

“Life is not scientific, social scientific, mathematical, or even religious; life is a unity, and the foundation for learning must be the unified experience of being a human being.” (Deloria, 1999, p. 59).

Indigenous people have always been mathematicians, developing complex and dynamic mathematical practices from within their grounded contexts (Nelson-Barber & Estrin, 1995). Mathematics within Indigenous contexts counters the perspective that mathematics stands on its own, a discipline that is separate from cultural and community life and responsibilities (Archibald et al., 2019; Barajas-López & Bang, 2018; Lipka et al., 2011; Nicol et al., 2010) Reciprocity and responsibility – to deeply experience gratitude and the responsibility to give back to larger systems of relationships, is an alternative to extractivism (Kimmerer, 2014; Klein & Simpson, 2017).

Scholarship within Indigenous mathematizing is based on and expects a wisdom in the thinking, doing, and being with a mathematizing process is a holistic way (Aikenhead, 2018; Archibald et al., 2019; Barajas-López & Bang, 2018b; Lipka et al., 2011, 2005; Nelson-Barber & Estrin, 1995; Nicol et al., 2010). From within Indigenous understandings, mathematics involves the “interrelationships, flux, observation, and evaluation in context, and a more circular notion of time prevail...where “progress” may be conceived of more in spiritual and ethical terms than in terms of decontextualized knowledge” (Nelson-Barber & Estrin, 1995, p. 176). Mathematics exists in our “unified experiences of being” (Deloria, 1999), interwoven into their axiological grounds. For example, Barajas-López & Bang (2018) illustrate through clay making, how Indigenous young people constructed scientific and mathematical knowledges within meaningful nature-culture relations. Lipka et al’s (2011) work with math in a cultural context places geometry within Yup’ik stories, teachings, and cosmologies. Archibald, Nicol, and Yovanovich (2019) start with stories and storywork and its teachings as a context for mathematical teaching and learning. This does not pose Indigenous mathematics in opposition to Eurocentric knowledges but show how the

expansion of mathematics help with the navigational possibilities for Indigenous young people to navigate across home and school life (Bang & Medin, 2010).

The continued removal and distancing of children from family and school from communal relations make it easy for teachers and educational authorities ignore the impacts an extractivism-assimilative mindset on families and communities. Designing to walk and story lands with families is as a way to understand mathematics with and emergent from lands and story (Marin & Bang, 2018). This is not simply finding everyday practices of mathematics and mapping them onto curricular understandings of mathematics. Instead, it is trying to understand how mathematical understandings co-occur in relation to other ways of understand one's roles and responsibilities and ultimately family-and-nation building towards families' collective continuance – to strengthen the ethical qualities of their relationships and their capacities to adapt and ensure that their lifeways flourish into the future (Whyte, 2014, 2017).

This paper comes as both a critical analysis of how mathematics has often been extracted from broader grounded axiologies of families and communities, as well as a self-reflection of my own practices and as families and I engage in storywork on their homelands (Archibald, 2008). Storywork as theory and method refers to the storytelling and storylistening with each other to understand the teachings for your own life and context (J. "Q'um Q. X. Archibald, 2008). I pay attention to how I learned to storylisten with families to begin understanding mathematics from within family and community contexts. I then reflect on how researchers-visitors with families can reproduce normative systems of power steeped in continued capitalistic production and domination *and* potential of storylistening to do research from the axiological grounds of families as well.

4.3 METHODS

In this paper, I focus on two family case studies of walking and storying lands in northern Thailand (Bang et al., 2014; Marin & Bang, 2018). This study draws from two family walks with a Hmong and Lanna Thai family where they were showing researchers (myself included) important places and practices in their home villages. I use a dual-site exploratory case study to illustrate how mathematics emerges from and exists within families' dynamic grounded axiologies. In these walks, we sought to understand families' practices as emerged, embedded, and were sustained with the land, particularly in the context of northern Thailand, where homelands or home villages are typically where people live and work.

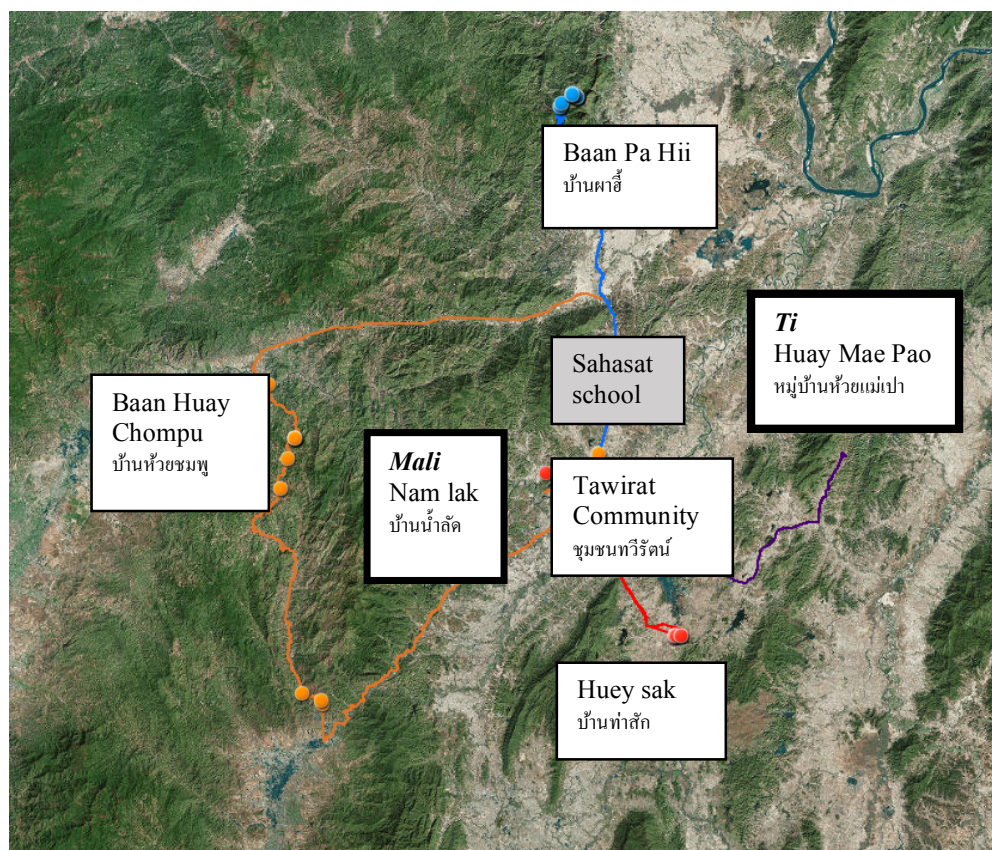
4.3.1 *Participants Case Selection.*

In December 2016, the teacher team, academic head, and the learning designers (myself included) gathered to select students that we wanted to study and follow for a year. Teachers selected students self-determined “ability” groups – those who were top performers in their grade, those who were average, and those whom teachers felt were struggling²⁰. We interviewed 9 students to learn about their home life and through the interviews, us as interviewers (Meixi, Khun Sukanda (Noi) & Khun Panthiwa) felt that we needed to follow these young people home to better understand their boundary and border crossings, their lives across multiple sites, and the meeting of multiple activity systems (Engeström & Sannino, 2010; Vossoughi & Gutiérrez, 2014).

Teachers played a key role in helping to coordinate these visits and Sahasat had helped with transportation to the various villages. Due to social constraints of three students whose families were unavailable, we finally ended up walking with only six out of the nine families in May 2017. These families are from geographically distinct villages or sub-districts (See villages on a map in Image 1), from four ethno-linguistic groups - Akha, Hmong, Karen, and Lanna Thai (Northern Thai). While all six walks were analyzed, I focus my analysis on two out of the six cases – Ti and Mali’s family. Ti and Mali’s families were selected out of the six for two reasons. First, in both cases, we were able to actually go out onto the lands where the practice they were focusing on is central. There is a particular focus on subsistence practices in this example specifically. For example, in Ti’s case we were able to walk the mango farm and talk about the family practice of caring for the mangoes. Similarly, Mali’s family talked about their practice of planting and growing rice at their rice fields. Second, these two walks consisted of intergenerational relationships – cousins, grandparents, and siblings were part of these two walks while this less obviously the case for the others. Furthermore, these two cases also were distinct and allowed for a broader range of comparison and connections across them. Ti is Hmong (an Indigenous tribe) at Baan Piang Mieang rai บ้านพญาเม็งราย and Mali is Lanna Thai and lives in the city in Baan Namlak บ้านน้ำลาด (Image 1). Within these two cases, I focus on reading and storying lands, while walking with families through their home villages.

²⁰ These categorizations are problematic but were used by teachers to think about how to select these young people.

Image 1. Sahasat and a sample of six villages that young people were from. Ti's and Mali's houses are bolded.



Ti.

Ti was selected by his teachers because in Grade 10, he was “average in everything”. Ti comes from the village of Huay Mae Pao (Hmong village in Phaya Mengrai District Chiang Rai province หมู่บ้านห้วยแม่เปา อำเภอพญาเม็งราย จังหวัดเชียงราย) and shares that his family has lived in the area for the longest time that he has known.

Mali.

Mali was invited to participate in this research by her teachers because they similarly saw her potential to grow as a teacher and learner. She lives close to the school in Baan Namlak (บ้านน้ำลาด) is Lanna Thai. Her family are all rice farmers and have a 10 rai rice field at the back of their living compound. In December 2016, she was in Grade 6 and was generally a quiet, “average” student in her teachers’ opinions.

4.3.2 Data Collection

Across the two families, the data for this paper is a mix of video data of family interviews and walks and artifacts such as family-created storymaps and photographs. I explain each kind of data in detail in the next section. Across the walks, we had team members (Khun Sukanda and Khun Panthiwa), teachers and academic leaders from Sahasat. Table 1 below shows a summary of the home visit and walk participants, and data collected.

Table 4.3. Descriptors of Walk Places, Participants, and Data Collected

	Case 1: Paj Family	Case 2: Hom Family
Date	May 8, 2017	May 12, 2017
Village	Baan Huay Mae Pao (Hmong village)	Baan Namlak (Lanna Tai village)
Focal practice	Mango farming	Rice planting
Walk participants	Ti ติ (Sahasat student) Pan (Mother) Beu (Sister) Kru Ton (teacher from Sahasat) Lung Seh (driver from Sahasat) Sukanda, Meixi, Alison (researchers)	Mali มะลิ (Sahasat student) Grandmother Bia (ເບີຍ໌ cousin) Big (ນີ້ກ, brother) Bas (ເບສ, brother) Sukanda, Meixi (researchers)
Data collected	Videos family interview (53 min) Video data of walk (39 min) Storymap Photographs	Videos of family interview (45 min) Video data of walk (26 min) Storymap Photographs

4.3.3 Design of Home Visits

I was interested in how these two families talked about mathematics and also embodied and understood it from within the lands and the practices that were important to them. Our home visits were designed with three main components: (1) family interviews, (2) storymapping, and (3) walking and storying lands around family-selected sites.

Family Interviews (Video data)

These interviews were semi-structured ethnographic interviews that took around 45-60 minutes with the young person's family. In both Ti and Mali's case, we had these interviews at their homes and video recorded.

Storymapping (Map artifacts)

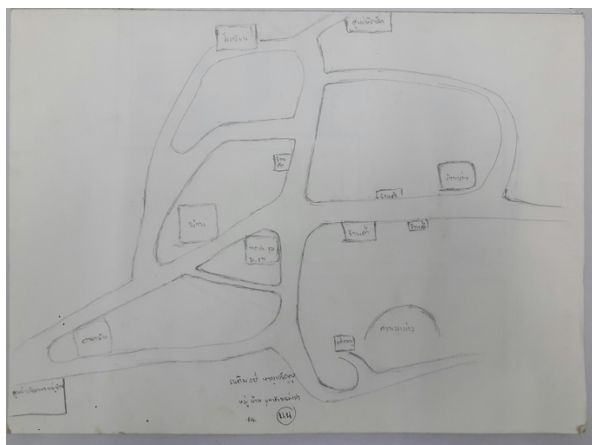
To hold the multiplicities of relations, before we walked the villages, each family was provided with an A3-sized paper to draw story maps of important places to them in their village. We used the following prompts to help young people imagine these maps and the stories of lands that were important, memorable, and powerful for them.

1. If you were to tell your teachers, what are your
 2. Where are your favorite places at home?
 3. What do you want to show us to understand your family & community?
 4. What are your memories/ important stories of home?
-
1. อยากขอนักเรียนนึกถึงที่ต่างๆที่มีความสำคัญสำหรับคุณและครอบครัวคุณ
 2. สถานที่ชอบที่มากที่สุด
 3. สถานที่ช่วยเราเข้าใจครอบครัวคุณมากขึ้น
 4. สถานที่จดจำ ชอบบรรยายและพาเราไปยังที่ต่างๆ ที่นักเรียนวาดในแผนผังและบันทึกไปด้วยกัน

With these prompts, the young people began drawing their village maps of places that were important to them and their family. We asked them then to describe their map and then take us on the walk with this map. In some cases, the young people drew their maps as a family interview was going on. Mali drew her map with her cousin Beia, while Ti drew his map and then used that to guide our walk. Both Ti and Mali discussed the routes and maps with their families before we went on the village walk.

Image 2. Storymaps from Ti and Mali

Ti's storymap



Mali's storymap



Walking and Storying Lands (Video data and photographs)

In the high mountains of Thailand, community forests and hunting practices that have been long parts of family and community life (Roth, 2008; Young, 1970). The two walks here were routes that families have walked often with growing mangoes (Ti) and working the rice fields (Mali). Within Indigenous concepts of time and space, time-space relations are not abstract forms in the present but are part of socioecological understandings that structure practice over historical scales and also unfolding moments of time (Bang & Marin, 2015; Smith, 2012). Drawing on Massey's (2005) definition of space, space is co-constituted by a multiplicity of relations, relations that are inclusive of past, present, and future relations. Walking and storying lands thus were ways to understanding complex, shifting relations with lands, specifically time-times relations as space is always open, dynamic and under construction and founded on a sphere of coexisting heterogeneity, a "simultaneity of stories-so-far" (Massey, 2005, p. 9).

Data from the walks consisted of about 25 – 40 minute video clips of families walking from their homes to various places in their village that were previously indicated on their storymaps or emerged as we moved around the village. In the Paj family's case, since the village was sizable, we went to some of the village sites by car and stopped at the community museum, a primary school, and a noodle shop. Video data of our walking and storying came primary from a walk through their mango farm. In comparison, we walked most of the family compound in Hom

family walk occurred from their house, passing longan²¹ fruit trees, a fish pond, on the way to the rice field and back. Walking villages also mattered because much of school is predicated on the explicit removal from land and land-based knowledges and practices that have sustained families across generations.

Before I began these walks, I was particularly interested in mathematics and how the everyday routine and important practices of families and students could be reclaimed as mathematical. In conversations with my childhood friend, Jamorn Jajong back in Chiang Rai who has long been a co-conspirator and collaborator in Lahu community, I asked him what would be important to show in this research? Jamorn said, we need to show how tribal highland people have knowledge and are doing mathematics. In Thailand, the complex mathematics from within home spaces and within the everyday practices of families are often erased where dominant and Eurocentric mathematics is valued and valid. Thus, the original intent was to make visible the rich knowledges – mathematical knowledges – within Indigenous life in Thailand.

However, because asking about mathematics from the beginning seemed both extractivist and narrow, we intentionally did not use ‘mathematics’ to frame families’ storymapping process or walks, nor explicitly ask about mathematics as we walked. Our intention was to understand first family practices and land, and from that, how and where mathematics emerged.

Despite that, knowing that the focus on mathematics was at the back of my mind, I kept looking out for mathematics, rather than families’ larger systems of relationships. *It is so easy to slip back into extractivism.*

4.4 ANALYSIS

The analysis in this paper takes the form of an exploratory case study within a dual-case design. I use three kinds of analysis in the paper – epistemic network analysis (Shaffer et al., 2009), interaction analysis of key episodes (Jordan & Henderson, 1995), and vulnerable observation through storywork (J. "Q'um Q. X. Archibald, 2008; Behar, 1996).

²¹ A type of fruit.

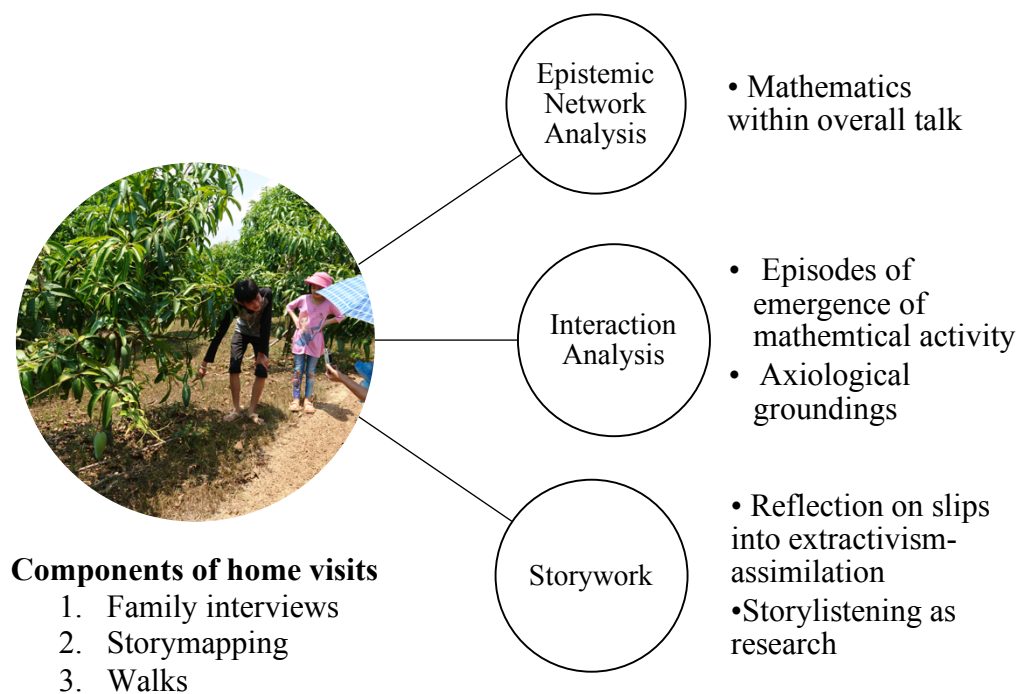


Figure 4.1. Data Analysis framework case studies of walking and storying lands

4.4.1 *Dual-case design: Exploratory Case studies*

For the first research question regarding the exploration of home practices and how mathematics is embedded within it, I use the family village visits as exploratory dual-case study to describe the variety of ways that cultural-historical home practices are contexts for mathematics (Yin, 2013). Since the participants were deliberately chosen because of their unique histories and profiles, I use two case studies to describe, compare, and connect the diverse ways in which mathematics is embedded within important family practices. Case studies are particularly useful for studying contemporary phenomena within real-life contexts using a variety of sources of data (Yin, 2013). Given the wide variety of my data sources (family interviews, village walks, story maps, etc), I use a combination of analysis methods – epistemic network analysis (Shaffer, 2017; Shaffer, Collier, & Ruis, 2016), interaction analysis of contextual configurations (Goodwin, 2000; Jordan & Henderson, 1995), and storywork and vulnerable observation (J. "Q'um Q. X. Archibald, 2008; Behar, 1996) to capture the complexities of family histories, practices, and relationships with lands. I use a combination of content analysis in the walks, asking what is mathematics connected

to, and pattern matching across the cases so see how each affirms, extends, and offers alternatives of each other.

4.4.2 *Unit of Analysis*

The unit of analysis within these two family walks was their talk around collective practices of importance to their family and community – primarily mango farming and rice growing in families’ respective villages in May 2017 at one time-point. Since these walks were our team’s first time with the families (we returned to visit families in January 2019), I make these analyses from within this time slice, while also being aware of how the past, present, and future are always co-constituting each other and it is through a multiplicity of times that I analyze the relations on the walk.

4.4.3 *Translations & Coding of Data with Grounded Theory*

The videos and artifacts were transcribed in Thai and then translated into English where both languages are represented in the transcripts to keep the talk close to what families shared. These transcripts and their corresponding videos were then logged in Inqscribe®, memoed and then coded in nVivo®. Codes were generated by an iterative coding process using grounded theory which is the process of generating theory from data and also theories that are “systematically worked out in relation to the data in the course of the research” (Glaser, Strauss, & Strauss, 2017, p. 6). Each phase of data collection and case selection (from December 2016 to May 2017) was informed by studying the data as it emerged through the use of fieldnotes and analytic memos (Charmaz, 2001).

The iterative coding scheme was developed to find themes that cut across the family interviews and talk during the village walks with specific attention to developing conceptual categories that examine how mathematics is embedded in family practice, places, and stories.

The transcripts were coded at each line of talk where a matrix graph of the co-occurrence of codes was made into an epistemic network graph with a code I had written in R. As with multi case studies, I began coding and memoing one case to begin to generate (1) initial theory around how mathematics was embedded within family life and (2) an initial coding scheme to be used across the family walk data. The three main-level codes for this analysis are: Relations,

Mathematics, and Family Practices. (See full Table 4.4 below for list of codes and full codebook and descriptions in Appendix B).

Table 4.4. List of Main codes (Gray) and Sub-codes (White)

Family practice (Aggregated)	Relations (Aggregate)	Math
Buying and selling	Day night relations	Extraction
Eating	Family relations	Gift
Embodiment	Following land	Mangoes
Fertilizer/ Pesticide	Machines and technology	Rice
Growing	Outsiders	Fish
Harvesting	Seasons	School
Kinds	Village Organization	Story
Planting	Water	
Preparing	Wind	
Reading land		

4.4.4 *Epistemic Network Analysis*

Epistemic network analysis is a method to code, quantify, visualize, and interpret connections within knowledge systems or epistemics (Shaffer, 2017; Shaffer et al., 2016). It was developed to understand patterns of association and *connections* within an epistemic frame – that is the knowledges, values, and skills within discourse around talk and joint activity. (ibid). This was a useful framework to make visible the relationships and connections of mathematics within family-based knowledge systems. I present the epistemic network graph of each family as part of the case study.

4.4.5 *Interaction Analysis.*

Marin & Bang (2018) share that the stories of lands “come to life” through relational processes of walking and reading lands. It is “structured by interactions with other people and more-than-human life, including land itself” (Marin & Bang, 2018, p. 112). Using multi-modal interaction sequences

of talk, signs, material spaces, gesture, and artifacts, my second layer of analysis pays attention to how the contextual configurations of families as they story land with histories, relationships, and axiologies in ways that mattered to them, and where and how mathematical activity surfaced. Contextual configurations “provide a systematic framework for investigating the public visibility of the body as a dynamically unfolding, interactively organized locus for the production and display of meaning and action” (Goodwin, 2000, p. 1490). Hall & Stevens (2015) citing Garfinkel (1967) said that the use of interaction analysis is to notice moments that are “observable and reportable” “unfolding moments of time but that is often connected...by participants themselves to broader scales of time, place, and social relationships” (p. 100; Jordan & Henderson, 1995). I sequence these in toonstrips to illustrate unfolding moments of the walks and how families were engaging with stories, land, and mathematics (Hall & Stevens, 2015).

4.4.6 *Storywork & Vulnerable Observation as Method*

Finally, I interweave my own self-reflection into this analysis. Building upon Behar (1996) who writes about the vulnerable observer, I similarly see this data analysis as a kind of storylistening and vulnerable observing – where the data shows me how I have not yet understood myself and importantly, the teachings I receive for my own life through it (Archibald, 2008). Gadamer’s (2004) proposes that truth emerges when we become aware of our own finiteness, where “Genuine experience is experience of one’s own historicity” (p. 351). Vulnerable observation occurs when we allow ourselves to be impacted by our data and the data analysis process. Storylistening with families on their lands and then again with videos further emplices ourselves in relation to them and their homelands. Research as storywork makes possible new meanings, powerful lessons, and new insights to emerge (Marin et al., forthcoming). It is reflecting and writing so “what happens within the observer...be made known” (Behar, 1996, p. 6). Similar to Behar (1996), this paper is an invitation to view perspectives in this paper from a learning scientist who is coming “to know others by knowing herself and who has come to know herself by knowing others” (p. 35).

Linda Smith writes, “One of the concepts through which Western ideas about the individual and community, about time and space, knowledge and research, imperialism and colonization can be drawn together is the concept of distance. The individual can be distanced, or separated, from the physical environment, the community. Through the controls over time and space the individual

can also operate at a distance from the universe (Smith, 2012, p. 58). However, knowing how we were connected – how these walks also changed me, is part of this paper.

Storywork in research reflects an understanding, enacting, and interrelating our own lives between the story, storytelling and storylistening (Archibald, 2008). It is only when “go into the stories themselves” (ibid, p. 134), to interrelate with them that we as researchers can engage in ethical meaning-making that practices respect, responsibility, reciprocity that seeks to honor the relationships with people and their stories (ibid). It is understanding the filters by which I saw/see, acted/act in family walks, as a researcher and the video data I dwelled in revealed some of the ways I have been “pulled up short” as a researcher, educator, and ally (Gadamer, 2004, p. 270). In this way, it is my hope that the method and findings push back against notions of purity and ableism both from within research and relationships with land. It is about consent and giving ourselves the permission to write through our brokenness and entanglements with capitalism and neoliberalism (Konsmo & Recollect, 2019).

A vulnerable observer framework begins with the stated intent or research objective, presents data where the analyzer’s in part of an interaction that shows how they are pulled up short, and shares the analyzer’s self-reflection. These are interwoven and also come at the end of the analysis with each family.

4.5 FINDINGS/LEARNINGS

I present two episodes on where mathematics emerged but were always within larger constellations of cultural practices (Rogoff, Najafi, & Mejía-Arauz, 2014). Within each case, I engage in three levels of analysis.

First, I present the epistemic network graph of each family from their walk to give an overall sense of the conceptual ecologies within their stories and talk. Second, I show episodes of mathematical activity that emerged during our walk and illustrate the ways that these mathematical practices were woven into families’ axiological grounds. Specifically, how mathematical practices are guided by and guide how family members understood their roles, relationships, and responsibilities. Finally, through a vulnerable observation (Behar, 1996), I interrogate the ways I asked questions with the families and my own slips into extractivist-assimilative paradigms, and the ways that families’ axiologies navigated these slips.

Through two cases, I show how mathematics emerged from within the axiological grounds of families and communities – the larger contexts of reciprocal relationships with lands, community roles and responsibilities. Second, using self-reflection as a tool, I examine how outsider-educators and learning designers could support or resist extractivist-assimilationist stances. In particular, I interrogate how my own interests in the mathematical practices of families both extend this stance, interrogate it, and learn as a storylistener when designing from home with Indigenous families and communities in Thailand.

4.6 CASE 1: TI, PAN & BEU AT BAAN HUAY MAE PAO (HMONG VILLAGE)

Image 3. Walk participants at Baan Huay Mae Pao



4.6.1 *Epistemic Network Graphs of Families*

This is a course analysis of families' general talk patterns and how broad concepts of land, family practices, and mathematics were connected to each other. In the first round of coding, I paid attention to turns of talk, if it was families that were initiating conversation or if it was outsiders, and the topics of talk that was initiated. In the Paj family, family members initiated conversation 26 times, and 16 of these were around family practices of harvesting, growing, buying and selling, 10 were in relation to mangoes, 3 related to mathematics, 3 with gifting, and 5 as connected to other relations (village organization, wind, water, family).

For the Paj family, 11.25% of our conversation around family practices (harvesting, growing, reading land, talking about kinds, eating etc) also mentioned mathematics and 22.30% of talk around mangoes involved mathematics. Because I was interested in families' conceptual ecology on their homelands, their "forms of knowing within the organization of human action" (Goodwin, 2013, p. 19; Bang, 2015;), I use an epistemic network graph to show how frequently the math code co-occurred with the other codes in the in families' talk while walking and storing lands. Below is a network graph of the various relations that mathematics was embedded within.

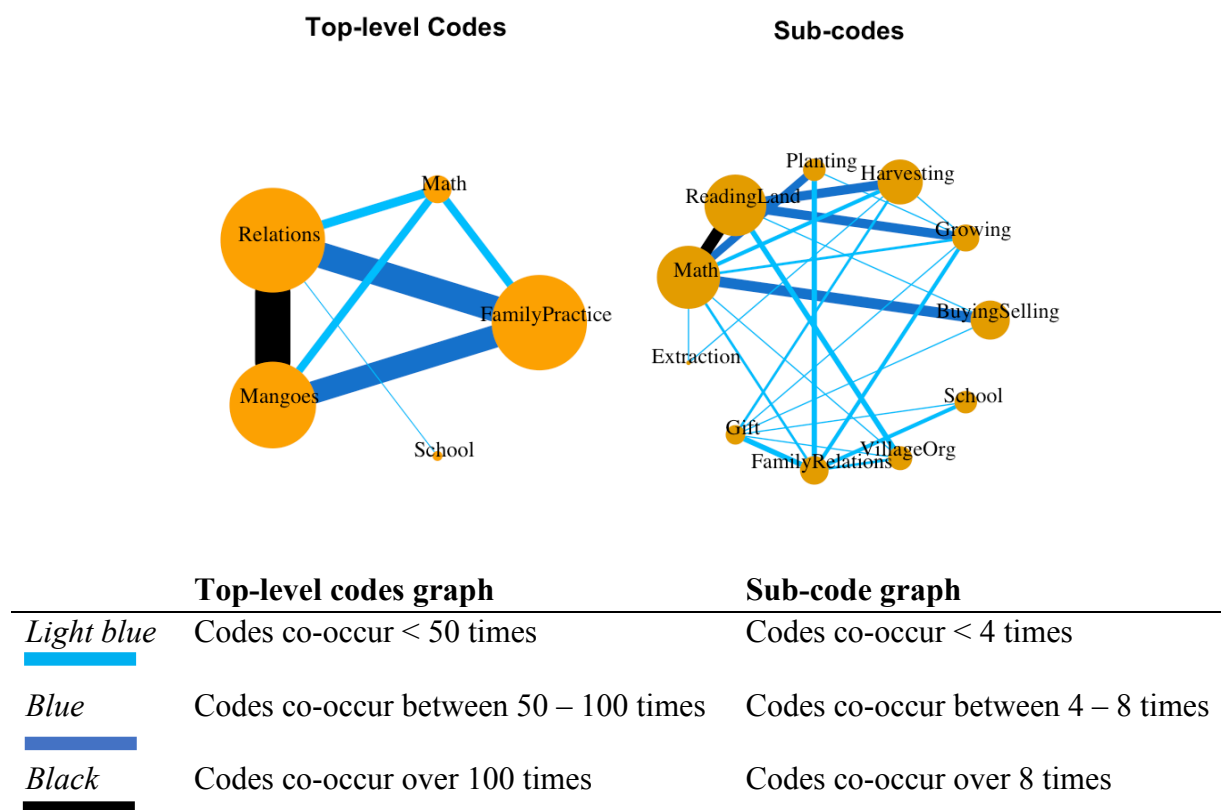


Figure 4.2. Paj families' Epistemic Network graph of how codes were connected in the walk.

Running this matrix in the igraph and Shiny package in R, this epistemic network analysis graph (Shaffer, 2017), makes visible how mathematics is connected within a web with other codes. Both the top-level code (Family practice, relations, and rice are aggregated) and sub-code graphs are color coded to reflect three levels of co-occurrence of codes (See legend above). Each orange circle represents the frequency of that particular code in the data set. The size of the circle corresponds to the relative frequency of codes and the color and thickness of the edges show the frequency of

the connection of the codes to each other. This shows 1) the range of relations that mathematics was connected to and 2) how frequently they were coded together at each turn of talk²².

In the top-level code graph, we see that for the Paj family walk, the math code co-occurs with family practices²³ (35 times), mangos (29 times), and relations (10 times). We can also see that mangoes and relations co-occurring with each other 130 times. In looking at the sub-code code graph, math co-occurs most with reading land (9 times), and with buying and selling (8 times), planting (6 times). It was interesting that math was not coded at all with “school” and “gift.”

4.6.2 *Interaction Analysis*

Here I present five episodes of mathematics within family practices to illustrate the ways mathematics was part of larger systems of relationships, roles, and responsibilities – a grounded axiology that was part of teachings for young people and how to be in the world. I chose these examples beginning with the mathematical practices that emerged with families (Episode 1 & 2) and then explore storied lands and contexts in which they emerged (Episode 3). In episode 4 & 5, I examine how families also navigate multiple activity systems particularly because mathematics is so tied to trade and quantities around exchange. In episode 5, I also examine my own slips into extractivism as a vulnerable observer and also my learnings as a storylistener.

Episode 1: Mango harvesting


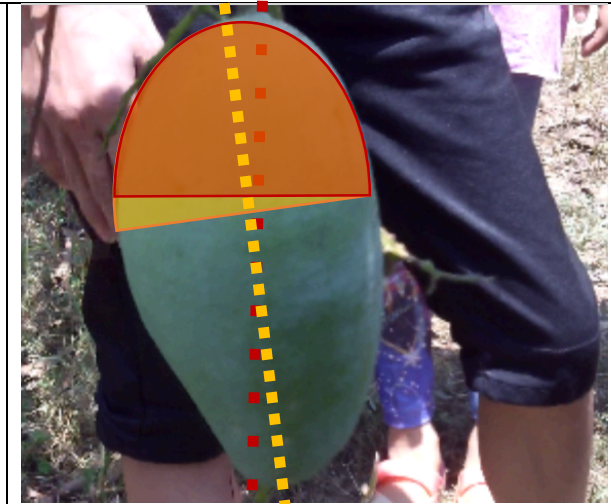
One place that was important to the Paj family was their mango garden with about 1500 mango trees. May is also mango harvesting time and before we met Ti at his home, he had just come from working on the farm that day. Prompted by Pan, Ti’s mother, our group walked excitedly through the field, carrying a few bags to bring a few mangoes home. In this episode, one of the Tutoría team at school, Noi, asks when Pan (Ne’s mom) knows when a mango is ready. Pan responds by using parallelism of surface planes – which is a three-dimensional reading of parallel planes. I examine this conversation in the toonstrip below.

²² Coding at each line of talk was useful to see how frequent mathematics co-occurred with other larger parent codes across the walk. For future analysis, additional chunking of the walk into episodes could help see how mathematics was connected across turns of talk in conversation.

²³ Relations: Day Night Relations, Family Relations, Following Land, Technology, Mangoes, Outsider Relations, Seasons, Village Organization, Water, and Wind relations.

			
<p>18:03 แม่ติ Pan (Ti's mom)</p>	<p>ลูกใหญ่ ใหญ่ This one is big big!</p>	<p>18:34 แม่ติ Pan</p>	<p>18:41 ติ Ti</p>
<p>18:09 ครูตัน Kru Ton</p>	<p>เขียวยักษ์ Green yak (Name of kind of mango)</p>	<p>ก็ดูอันนี้ ที่หัวมัน ตั้งๆ หัวมันตั้งๆ หัวมันวงกลมๆ Well you have to look here, at the head of the mango, when the head is set, the head has to be a circular.</p>	<p>เนี่ยครับ เค้าดูจาก หัวมันเนี่ยครับ แบบ มันจะขนาน ขนาน Here, she sees from the head here, like this it is parallel to the ground, parallel.</p>
<p>18:18 น้อย Noi</p>	<p>เอ๊ะ อย่างนี้เราเก็บ ได้หรือยังคะ Like this is it ready to be picked?</p>	<p>18:39 น้อย Noi</p>	<p>หัวต้องเป็นอย่างเง How has the head (of the mango) have to be?</p>
<p>18:21 ติ Ti</p>	<p>ยังๆครับ ยังไม่ตรง Not yet, it's not straight yet.</p>	<p>18:34 แม่ติ Pan</p>	<p>เหมือนเนี่ย Like this. Mom walks to another mango tree and we follow her.</p>

Returning to our definition of mathematics as involving patterns, quantities, measurements, rhythms, space, and relations, it is obvious why mathematics was part of family constellations of practices. Pan first describes the mangoes as needing to be “straight” or “ตรง” and when probed further, she moves from looking at the axel of the center of the mango to head of the mango, saying that “when the head is set, the head has to be a circle.” She switches from looking at the longitudinal angle and position of the whole mango to its head where she began reading the mango in terms of a cross-section of the head’s width. Ti adds onto this by showing how the widest cross-sectional plane of head of the mango would be parallel (ขนาน) to the ground if it was ready to be picked. He reads the land by looking at parallel planes of the ground level and the cross-section of the hemisphere of the head of the mango. The table below show the parallel plane comparison.

	
<p>The mango above is ripe while the mango below it is not “straight” enough when considering the angle of its axis.</p>	<p>This mango is still not ripe yet as the widest cross-section of the spherical head is not yet parallel to the ground.</p>

While this seems like a simple practice, it requires the coordination of land topography, with the angles of the mangoes, imagining the cross-section of mangoes, one mango in relation to the other, observations of the shape and size of the mango to know which type of mango they are, as well as reading the land various vantage points and distances. As the family moved through the field, Pan would repeatedly walked towards different trees to begin harvesting the mangoes while I and others in the team had to keep asking or confirming with Pan or Ti if that mangos we thought we

ripe could be harvested as we had not yet developed the mathematical literacy of the land. Mathematics – in this case, the complex reading of lands using keen and dynamic observation of shapes, geometrical patterns, and cross-sectional comparisons of parallel planes was a way that Ti and his mother moved through the mango farm.

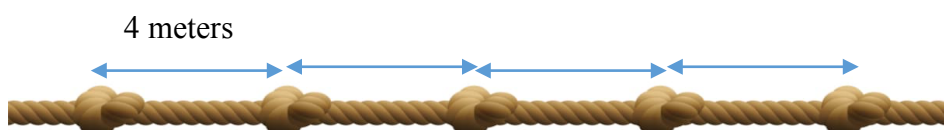
Episode 2: Measuring the land.

As we continued to walk, more stories of the mango garden that emerged. The next episode focuses on a conversation about how Ti and family plant mangoes in the field. Ti and Pan discuss the techniques of planting, with whom, and how planting new mango trees in the garden is embedded within responsibilities that Ti is growing into. For example, Ti's father who has been away at work for the year is called into the conversation with Ti's mother saying that "it used to be my husband" as the person who measures and plants the mangoes while Ti has been learning and taking on these new roles and responsibilities.

			
<p>20:49 แมติ Pan (Ti's mom)</p> <p>อันนี้รุ่น 3 รุ่น 3 อันนี้ This is the third generation or the third round that the mango tree produces its fruit.</p>	<p>20:53 น้อย Noi</p> <p>และใครเป็นคนวัด ระยะ ละคะ Who is the person to measure the distance?</p> <p>20:56 แมติ Pan</p> <p>แต่ก่อนแฟน Before, it used to be my husband.</p> <p>20:56 น้อย Noi</p> <p>แต่ก่อนแฟนเป็นคน วัด ไซ้ไหมคะ Oh before, it used to be your husband as the one who measures.</p>	<p>20:59 ติ Ti</p> <p>เขาจะมีแบบเป็นเชือก ครับ แล้วยกไปจะมีไม้ วัดครับ ก็วัดๆ วัด We carry a rope to measure, and measure measure and then we use a stick to mark mark mark a hole.</p> <p>21:03 แมติ Pan</p> <p>วัดตามเชือก Measure by rope.</p> <p>21:04 น้อย Noi</p> <p>เอาไม้ไซ้ไหม Use wood right?</p>	<p>21:06 ติ Ti</p> <p>ครับ แล้วก็เอาไม้เสียบๆ ๆ แล้วยก - And then, we use the wooden stick to mark mark and then -</p> <p>21:07 น้อย Noi</p> <p>เชือก หมายความว่า เชือกนี้มัดเป็นระยะ 4 เมตร 4 เมตร ไซ้ไหมคะ Rope (.) that means the rope that's tied and you use to measure is 4 meters, 4 meters right?</p>

				
<p>21:11 ติ Ti</p> <p>ไม่ใช่ครับ เอา เชือกแบบ เรามัด เป็นตุ้ม แล้วก็ดึง No krap, we tie it into knots and then pull the rope tight.</p>	<p>21:15 น้อย Noi</p> <p>เป็นเส้นตรงใช่ไหม Like a straight rope right?</p> <p>21:15 ติ Ti</p> <p>ใช่ครับ เส้น ยาวๆ แล้วก็มีสองคนยกๆ แล้ววัดๆ Yeah, long rope and then two people lift it up (again and again) to measure.</p>	<p>21:18 แม่ติ Pan</p> <p>ปีที่แล้ว ปลูกอีก สวนหนึ่งนะ เนติ พงษ์ก็ไปลง - วัด Last year, we planted another garden, Ti also went to measure.</p>	<p>21.22 น้อย Noi</p> <p>- ไปวัด จำได้ดี เลย โอเค That's good to remember. Okay.</p>	<p>21.28 แม่ติ Pan</p> <p>500 ต้น 500 trees.</p>

As Ti hears his mother calling his father into the role of being the person who measures the distances between mangoes to plant, he offers his own experience of measuring the fields to plant the mango trees. Ti describes a practice where at least three people work together to use a long piece of rope, with knots tied at 4-meter intervals. At each knot, the third person then uses a stick to mark the land for places to plant the new mango trees.




Similar to Verran's (2000) analysis on Yoruba number and measurement, numeration is treated as a relational multiple instead of a fixed linear extension from point zero. Quantities are not static and abstract, but rather one that involves patterns of distances in space and land. In thinking about mathematical goals, this measurement strategy for the goal of mango planting happens in the context of family responsibilities.

To Ti's description, his mother then chimes in to say Ti was the one who went to plant the garden last year (Timestamp 21:18). While she previously began thinking about her husband as the person who measures the mangoes, she now reaffirms Ti growing into this role and tell the story of how he planted 500 trees last year in a new garden they have. Thus, planting mangoes and the combination of quantities (4-meter) measurements and spatial patterning in the land for Ti is part of larger family roles and responsibilities. Mathematics is part of contributing to the flourishing of community roles and relations. In this episode, mathematics is less a site of colonialism but rather expands possibilities for community (re)generation and for young people to learn their roles and responsibilities in family life.

Episode 3: Grandfather stories.

As we continued walking, Pan, Ti's mother calls out to Ti and points in the distance. From this point, she begins sharing about family practices, the spirit world, and the relationships they have with these lands. Close to the end of the walk, Pan calls out to Ti in Hmong and points to a large tuft of straw in front of us.

			
<p>28:56 แม่ติ Pan</p> <p>Ti koj nqha puab hais tias ntawv (Hmong) Ti, you tell her that there.</p> <p><i>She points in the distance.</i></p> <p>29:02 ติ Ti</p> <p>อันนี้ครับ This here.</p>	<p>29:04 น้อย</p> <p>อะไรคะ What ka?</p> <p>29:10 แม่ติ Pan</p> <p>ปู่เสีย ก็เอามาไว้ตรงนี้ Grandfather, when he passed, was buried here.</p> <p>29:13 น้อย Noi</p> <p>นั่นหรือ? There?</p>	<p>29:24 ติ Ti</p> <p>ตามความเชื่อก็คือ เค้าเชื่อ ว่า ถ้านำมาฝังไว้ตรงนี้ ก็ จะช่วยดูแลสวน</p> <p>Following our beliefs, it is believed that if we bring him and bury him here, he will help look after the garden.</p>	<p>29:27 น้อย Noi & เมซี่ Meixi</p> <p>โออ Ohh. ดีมาก That's wonderful.</p> <p><i>We continue walking through the farm</i></p>

Ti speaks in Thai and calls our attention to the tuft of straw as his mom explains that Ti's grandfather is buried here to “help look after the garden.” Indigenous notions of time often operate from different positionings and orientations to time-space in relations to the past, present and relationships with land (Smith, 2012). This was enfolded in a physical way with grandfather's body and spirit taking care of the land alongside his relatives. Mango planting and harvesting – and the mathematical practices within it - were no longer menial tasks or practices but emerge from one's axiological grounds from which to move and act (Simpson, 2017). Time-space relations are not linear and abstract but are “fused with social and ecological unfoldings of history and knowledge systems” (Bang & Marin, 2015, p. 533). Similarly, Ti's grandfather was still looking after the mangoes and Ti growing into that role and responsibility was an act of reciprocity to his ancestors and family.

As we reach the end of the land, Ti continues to retell the stories of his grandfather and his role in the land, in the village, and in relation to other villages. When Noi asks Ti about where the land ends, Ti responds that the land is the one that determines where the farm ends. Their conversation flows as follows:

แม่ติ Pan	ตามพื้นที่ของเรา ถึงไหนก็ถึง นั้น	1. Depends on the land of ours, wherever it 2. ends, it ends.
น้อย Noi	ใช่ไหม? ตามพื้นที่ที่เราไปเลือก ก่อนนั่นเอง ใช่ไหม?	3. Right, depends/follows the land of ours that 4. we have picked out before for ourselves right?
แม่ติ Pan	อันนี้ของพ่อ อันนี้ของพ่อ เขา ให้...ก่อนที่ไม้ได้ปลูกนี่ ที่นี้ พ่อแม่เขาให้เรา เขาให้เรา ปู่เป็นคนมาอยู่ในหมู่บ้านนี้ เป็นรุ่นแรก ๆ และก็ บ้านเลขที่ นี้ ก็เป็นบ้านเลขที่ 1.	5. This is my father's. This is my father's, he 6. gave it... before we couldn't plant anything 7. here. This here, my father and mother, they 8. gave it to us, they came to give it to us. 9. Grandfather was the person to come live here 10. he was the first generation. And our house 11. number well, was house number 1.
ติ Ti	ปู่มาอยู่ี่ครับ เป็นรุ่นแรก ๆ ก็ เลยสร้างเป็นบ้านที่หนึ่ง แล้วก็ เรียงสอง สาม นี่ก็คือโซนฝั่ง ฝั่งที่บ้านผมนี่ก็จะเป็นโซนฝั่ง สอง สาม ครับ บ้านเลขที่เรียง มันก็อยู่ครับ แบบมันจะเป็น ถัดไปก็จะมีหมู่บ้านลาหู่ อยู่ทาง	12. Grandfather was the person who came to live 13. here for that first generation. And our house 14. here was house number 1. Grandfather was 15. the first generation that lived here, so he 16. built his house then his house number is 17. One and then other house numbers were in 18. order Two and Three. That's on the zone, 19. the zone where my house is is Zone 2, then 20. zone Three. The House numbers that are

- | | |
|--|--|
| <p>ฝั่งนู้นครับ แล้วก็ที่จริงที่ดินฝั่ง
นั้นก็ยังเป็นปู่เขาหมดเลยครับ
แต่พอလာหู่เข้ามา เขาก็ค่อยๆ
ขยับๆ เข้าไป ปู่เขาก็เลยบอกว่า
ที่ดินนั้นไม่เป็นไร ก็เอาให้เขา
ไปเลยครับ</p> | <p>21. arranged. We were also living there, same as
22. there, next village there is a Lahu village, over
23. there. Actually the land over there was also all
24. part of grandfathers' land. But because the
25. Lahu came, he also slowly moved, moved
26. away. Grandfather said that the
27. land there, it's alright, let them have it.</p> |
|--|--|

To Noi's question that reaffirms that it ends that "follows the land of ours that we have picked out before for ourselves right? (Line 3 -5)" Pan rephrases this by saying, this land is not what we picked, but a gift. She says, "This is my father's land, he gave it" (Line 6-7). She locates conversation in place, repeating, "This here, my father and mother, they gave it to us, they came to give it to us" (Line 8-9). Their gift to them made planting mangoes possible because "before we couldn't plant anything here" (Line 7-8).

Ti continues to story the land with his grandfather and reveals that this land was not just what his family had picked out, but it was a gift. With gifts there are different sets of responsibilities and axiologies of gratitude (Kimmerer, 2014). Mathematics – the problem solving with practices involving patterns, quantities, measurements, space – are nestled within a much broader system of a family's grounded axiologies, reciprocal relationships and responsibilities.

Episode 4: Ti with pesticides.

Pesticides was a topic that Ti and Pan, his mother had mentioned the in beginning of the walk. Pan points out the place where she mixes the pesticides at the entrance to the mango farm. In this episode, Ti discusses his families' use of pesticides in the mango farm.

- | | |
|--|---|
| <p>น้อย: พ่นยาใช่ไหม?
Noi พ่นบ่อยไหม?</p> | <p>1. Spraying pesticides right?
2. How often do you spray?</p> |
| <p>ติ: ไม่บ่อยเท่าไร
Ti</p> | <p>3. Not that often.</p> |
| <p>น้อย: แล้วเวลาผสมยานี้หละคะ หนู
Noi ผสมอย่างไรคะ?</p> | <p>2. So then when mixing the pesticides,
3. how do you mix it?</p> |
| <p>ติ: แม่เป็นคนผสมครับ
Ti ผมไม่รู้เหมือนกัน</p> | <p>4. Mom mixes it.
5. I don't know either.</p> |

- น้อย: อ้อ หนูไม่รู้ แต่แม่เป็นคนผสม
Noi ยาใช้ไหม
- ติ: เนี่ยครับ... ลองสังเกตดู แต่
Ti ละต้น มันจะไม่เหมือนกัน
แบบนี้จะแบบสากๆ แต่
กระตุ้นบางลูกจะเป็นสีเข้ม ๆ
มันจะต่างกันครับ
- น้อย: เพราะว่า ใบมันไม่ค่อยมีคลุม
Noi ใช้ไหม
- ติ: ครับผม
Ti
6. Ohh, you don't know but mom is the one that
7. mixes the pesticides right.
8. Here see... We try to observe each tree, each one
9. will not be the same.
10. Like some will be rough but we help
11. activate some fruits. Some are a little
12. darker in color. So each one will be different.
13. Because the leaves are not in a cluster
14. right?
15. Yes.

When Noi asks the question “how often do you spray” the pesticides and “how do you mix it” (Line 2; 5), Ti does not give a count of the frequency or the ratios in mixing the pesticides. Even though numeracy and ratios could be important in the spray of pesticides and the mixing of pesticide proportion, Ti resists giving a numerical or count response. He makes clear that it is his mother that holds the know-how of mixing the pesticides but then offers insight on how much pesticide is used and how from a grounded reading and knowing of each mango tree (there are 1500 trees now in the garden). The application of pesticides comes from a keen observation of each tree, its fruit, and its leaves, and insists “each one will not be the same” (Line 10-11). Mangoes exist both within family relations, ethical commitments with lands, as well as commodification and trade. Buying and selling was coded 26 times in the data.

This episode illustrates the dynamic nature of Ti’s conceptual ecology and forms of knowing with land even with tools and farming techniques like pesticides (Goodwin, 2013; Bang; 2015). Indigenous knowledge systems are fluid and adaptive and in this case, were taken up in responsive ways that guided Ti’s attentiveness to how pesticides were used with each mango tree. In recent years, there is more awareness in Thailand around the harmful health and environmental detriments of pesticide use in farming for families and on consumers. It is common knowledge for people to be weary of the use of pesticides and eating food that is intensely sprayed (Charoensuthipan, 2017; IPM Info, 2016). Ti uses pesticides through keen attentive observations of lands and the health of the mango trees, it is grounded in different sensibilities. Ti knows and makes clear that each tree, even each fruit on each tree is different and the application of pesticides

is still guided by intimate knowledge of each mango tree and the familial responsibilities to care for the mangoes. The responsiveness of Ti's grounded axiologies in the face of a tool that is not "pure" shows how families' grounded axiologies are the first base that guides practices with lands, even and especially when mangoes are part of economic activity and production. Even though mangoes and mathematics can be part of production, consumption and economic activity for the family, such activity still emerges and exists with Ti's axiological grounds and sensibilities.

At the intersection of localities and global cultural flows, (Appadurai, 1996), families are always appropriating tools that are useful to them as these sociocultural changes occur. As we are in a time where our "bodies are entangled in infrastructure," this episode complicates notions of purity with lands to illustrate how capitalistic tools can be used and guided by families' grounded axiologies (Konsmo & Recollect, 2019, p. 243). Indigeneity, mathematics, and relationships with land are not "pure." Families navigate mathematics as based in family responsibilities *and* systems of trade and capital. Ti refuses to offer a blanket quantity but seems to be guided by a grounded axiology to care for the mangoes at the farm. I suggest that Ti shows how knowing from these grounded axiologies are more than frameworks but "ongoing," responsive, and continually emergent and interconnected based on "relationships of deep reciprocity, intimate and global interconnection and interdependence, that spirals across time and space." (Simpson, 2017, p. 25).

4.6.3 *Storywork*

Episode 5: Gifts of Mangoes.

I deepened my own understanding of researcher learning as gift giving and receiving through this walk. As mentioned previously as we were walking lands with Ti and family, us as visitors, were looking for, and carrying bags to harvest mangos. Part of the conversation on harvesting mangoes was driven by us, as outsiders, who spoke of an interest in buying mangoes from their family, giving back to their family business, and bringing these mangoes as gifts to our own families and communities.

At the end of our walk, Ti's mother wants to gift us, the researchers and teachers, mangoes. Similar to Mali (See Case 2), these were moments where I slipped into capitalistic frames of when the underlying ethic was one of gifting. Our conversation is as follows:

เมซี่ Meixi	เท่าไหร่คะ	How much is it?
แม่ติ Pan	ไม่เอา	We don't want (your payment)
เมซี่ Meixi	ไม่ได้ๆ เอาๆ	We can't do that.
ติ Ti	ไม่เป็นไรครับ	It's okay.
แม่ติ Pan	อ้อ ไม่เอา	We don't want it.

It became clear not just at the end of the walk but through reviewing or videos, that my desire to resist extractivism also perpetuated capitalistic and colonial enclosures. Although Pan wanted to gift us mangoes, in my efforts to resist extractivism, I unethically insisted on buying and compensating her and the family for the bags of mangoes that we were harvesting on our walk. I even insist on buying from them at the market price when they wanted to gift us mangoes as a way to resist extractivism. Resisting extractivism through re-engagements with capitalistic notions of buying and selling was not the clear answer either. While notions of capitalism, gifting, and compensation are complex and complicated, Pan was teaching me that there are possible ways to do research as reciprocal gift giving. This deepened my own sense of responsibility to those stories because it carried relational understanding of research that follows and listens to the axiologies of those we work with, and how to have relational grace with ourselves and with others as we become researchers-storylisteners-storytellers (Marin et al, forthcoming).

Resisting extractivism is never pure, nor is there only one way to do so; complexities of “purity” are real in the work. In the end, we gratefully received these gifts from Ti and his mother and hope that through our gratitude, the sharing and listening of stories, the continuation of our relationship when we spent Hmong new years with them a year later, and this paper, are my small acts of reciprocity to Ti and his family.

4.6.4 *Summary of the Case of the Paj Family*

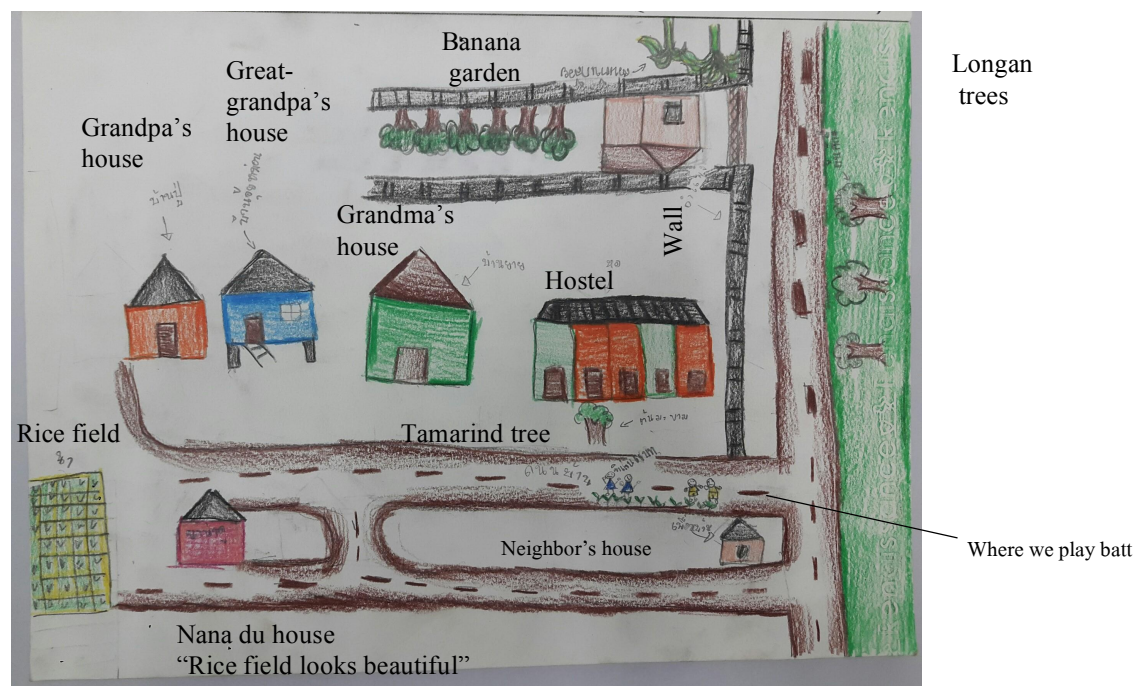
The five episodes discussed in Ti's case illustrate their families' mathematical practices of patterns and parallel planes and spatial measurements within the planting, growing, and harvesting of mangoes. As we walked, relational stories of lands continued to emerge as shown in episode 3 and 4, as well as how Ti and family navigated multiple systems within their interactions with land. For example, the stories of land, the spirit world and family responsibilities to them were present with lands and so was their participation in capitalist markets for the production and commodification

of mangoes. The Paj family case helps make visible how grounded axiologies are responsive, dynamic, and reciprocal; they guide tools and farming techniques, and their mathematical practices with land, just as these tools and practices are ways to express and encode these grounded axiologies across the multiple activity systems that they participate in as individuals and families.

4.7 CASE 2: MALI, GRANDMA, AND BIA, BIG, AND BAS AT BAAN NAMLAK

Mali is Lanna Thai and are one of the few non-tribal students at school. At this point in time, she is in Primary 6 (Grade 6) and going onto Mattayom 1 (Grade 7) at Sahasat school. When she and her cousin draw this map, they point out important places like the longan²⁴ garden and where they catch insects at night.

Image 4. Hom Family's Story Map



4.7.1 Epistemic Network Analysis

The Hom family initiated conversation or noticings 14 times, of which 5 were in relation to family practices (rice growing, harvesting), 5 to directions or relation to place, 5 to family, village, more-

²⁴Longan is a kind of tropic fruit

than-human relations such as insect and fish, 1 in relation to rice, and 1 in relation to story. Similar to the Paj family, we can see that mathematics is an everyday part of family life and conversation. For the Hom family, 10.87% of all conversation around family practices had mathematical content in it, and mathematics accounted for 18.85% of all talk with rice.

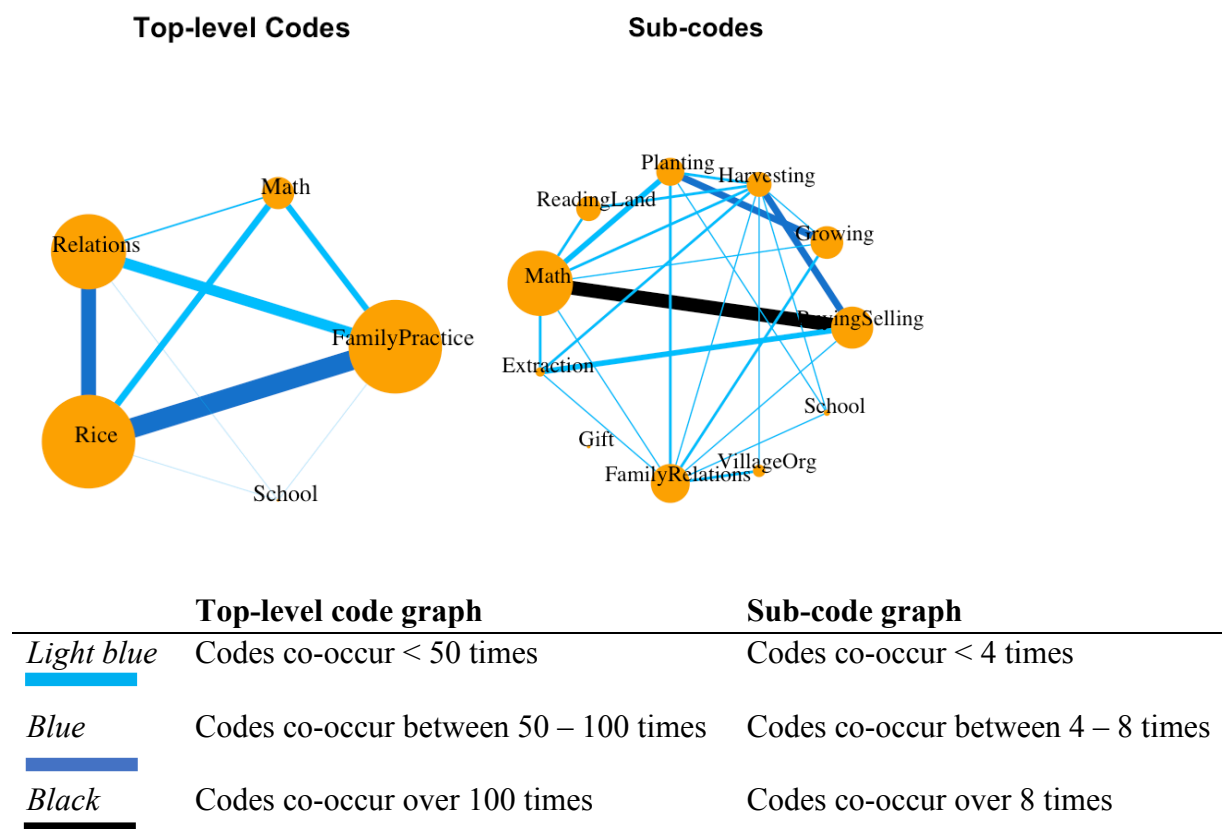


Figure 4.3. Hom family's network graph of how codes were connected in their walk.

The Hom family's top-level code epistemic network graph looks similar to the Paj's (See Figure 4.2). Math co-occurred with talk around family practices 33 times, around rice 23 times, and with relations 6 times. Rice co-occurred with family practices 68 times and with relations 51 times. This shows how rice is part of various relations (family relations, village organization, wind, water, outsider relations), and how mathematics was connected to that. In the sub-code graph, this shows how for the Hom family, mathematics was most frequently co-occurred with buying and selling (10 times), planting rice (4 times), and outsider relations (4 times). I explore mathematics within these two instances – within planting of rice and then subsequently within buying and selling practices with rice and her family.

4.7.2 *Interaction Analysis*

In Mali's case, I present four episodes of where and how mathematics emerged within the walking and storying homelands. Episode 1 & 2 are centered on two contextual configurations of the use of numeracy with the body while planting rice. Episode 3 looks at various conversations around buying and selling with rice and how families think about numeracy in the context of trade and exchange, common in many communities (Yasukawa et al., 2018). Finally, Episode 4 is based on an interaction I have with the family and my own slips into extractivism when thinking about mathematics from within community contexts. Episode 4 also illustrates how families seem to use math in buying and selling but actually use mathematics from within their grounded axiologies with regard to profits and quantifying rice as a commodity.

Episode 1: Rice planting as intergenerational practice

Planting and growing rice was an important practice for Mali and her family. In the rain, we all walked out from their house to a 8 rai²⁵ (ไร่) rice field behind their village. The following episode examines how the family talks about the rice field and its familial importance for them.



²⁵ 1 Rai is equivalent to 1600m²

			
<p>ยาย Grandma ปลุกข้าวเป็นคะ ปลุกข้าวได้ All of them can grow rice.</p> <p>น้อย Noi: อ่า ทุกคนทำได้หมดเลย All of them can?</p>	<p>ยาย Grandma ทำได้คะ. Yes, they can.</p>	<p>เมซี่ Meixi เรียนปลูกข้าวอย่างไรคะ How did you learn to grow rice?</p> <p>บ๊ิก Big (Brother) ยายกับตา Grandma and grandpa</p>	<p>ยาย Grandma เอาต้นกล้ามานะคะ ต้นกล้ามาเป็นกำ Take the saplings, about a handful.</p> <p>น้อย Noi จะ Yeah.</p>
			
<p>ยาย Grandma แกะออกมาทีละต้นๆ คะ บ๊ิก 4 ต้นนะ ถอยหลังคะ Take out each sapling. Push 4 saplings down and then pull backwards.</p>	<p>น้อย Noi อ้อ ไปข้างหน้าก่อน แล้วถอยมา I see. Start at the front first and then pull backwards.</p> <p>ยาย Grandma คะ Yes.</p>	<p>น้อย Noi: แล้วห่างกันอย่างไรคะ How about spacing?</p> <p>ยาย Grandma บางคนก็จะเดินหน้า ห่างระยะ สักคืบ Someone moves forward. One palm span for each space.</p> <p>น้อย Noi: อ้อ Ohh.</p>	<p>ยาย Grandma แต่ละต้นนะ คืบหนึ่ง อันนี้มันเป็นข้าวหวาน Each sapling is spaced one palm-span. This is sowed rice.</p>

Analysis: Planting rice clearly had relational significance for this family. First, when asked about stories in the rice field, grandma immediately says and repeats with pride, they all can plant rice, they can do it. In my follow-up question ask how did they learn to grow rice, Big, her grandchild says, from “Grandma and grandpa” – indicating a kind of reciprocity and responsibility where planting rice is an intergenerational practice that Mali and her brothers carry from their grandmother. This reciprocal recognition was evident in grandma’s acknowledgement of what her grandchildren can do and in turn, her grandchild’s acknowledgement of her role in teaching them to do so in return. Furthermore, rice is placed within its growth, cultural, rain and seasonal cycles and she makes sure we know which cycle of rice we are in, telling us “อันนี้มันเป็นข้าวหวาน This is sowed rice.”

Mathematics is embedded within and is a part of these relations, First, Grandma talks through the process of counting the rice saplings and evenly spacing them in the rice field. She uses patterned spacing of the plants using palm-widths. She explains this in greater detail at the end of the day when I ask what calculations are involved in rice planting.

Grandma begins by spreading out her two hands side-by-side and so do Noi and Big. She then switches from palm-widths to the length of her hand from the tip of her middle finger to her wrist. This switch begins to see the hand as a figure with equal lengths and widths – to make a regular circle or square (Section 1 below). She then toggles between understanding measurements and counts through the inter-rice spacings and the points that the rice need to be planted. First, she counts *two* negative spaces with the length of her thumb and middle finger on the right hand from the tip of her middle finger of her left hand to her elbow (Section 2 and Image stip 2 for a closer analysis). She sees palm-widths in relation to the length of her forearm and uses the two body measurements to help create a visual multiple from which the rice saplings need to be planted apart from each other in a ratio of 1: 2 (see page 93).

Section 1: Palm as width and height		Section 2: Counting two negative spaces	
			
<p>น้อย Noi</p> <p>มะกี้เด็กๆทำแบบนี้ เด็กๆทำแบบนี้ Just now the kids were doing like this. The kids did this. <i>She stretches out her two hands and spreads her fingers apart.</i></p>	<p>ยาย Grandma</p> <p>มันก็พูดไปเรื่อย คีบ คือ ว่าขนาดนี้เนอะ ค่ะเนอะ That that was said was, was that this size. <i>She holds her right hand up and uses the length between her middle finger and thumb to correspond to length of her left hand.</i></p>	<p>น้อย Noi</p> <p>ค่ะ Yeah. ยายบอกขนาดคีบ ก็ขนาด นี้คะเนอะ I was saying palm-width, the size like this.</p> <p>น้อย Noi</p> <p>โอเค เนี่ยก็ขนาดคีบก็ ขนาดนี้เนอะ Okay, the size is the palm- width, like this.</p>	<p>ยาย Grandma</p> <p>ศอกนี่อะ The elbow here. <i>Grandma uses the middle finger and her thumb to measure a palm's-width and then brings her middle finger to her thumb, replaces the position of her thumb with her middle figure and then extends it out again to the joint of her elbow.</i></p>


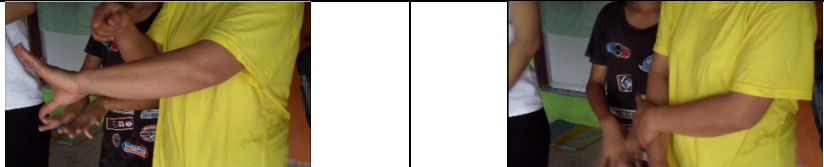
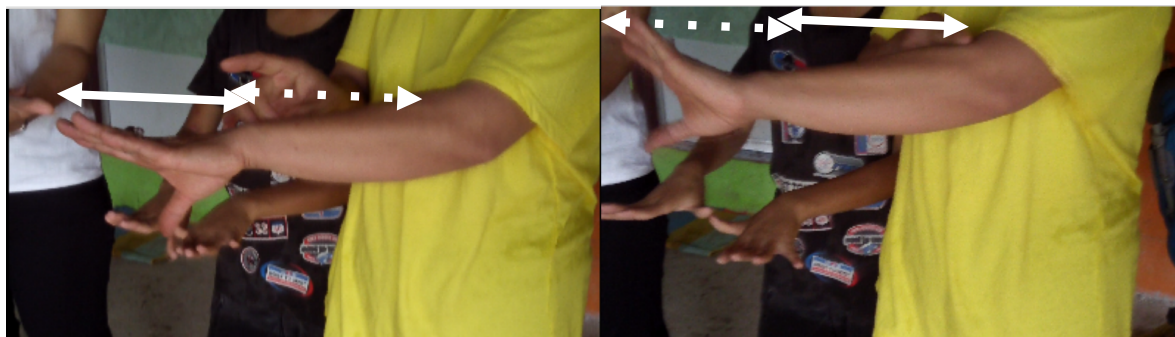
Section 3: Counting as three points			Section 4: Replacement of hands	
				
<p>ยาย: ศอกนี้ 3 ต้น Grandma - หนึ่ง</p> <p>The elbow here 3 plants - one</p>	<p>ยาย สอง Grandma Two</p>	<p>ยาย สาม Grandma Three</p>	<p>น้อย Noi</p> <p>อ้อศอกนี้ได้ 3 ต้นเลย - 1, 2, 3 Oh, so one elbow we can plant 3 rice saplings- 1, 2, 3 <i>Grandma holds her position as Noi repeats what she just heard from her.</i></p>	<p>ยาย: จะ Yes. Grandma <i>Her hands lower, so do Big's.</i></p> <p>น้อย Noi</p> <p>ก็มีวิธีวัดหลายแบบเนอะ We have many ways for measuring. <i>Children nod in agreement.</i></p>

Image strip 2. Negative space counting for inter-rice spacing



She repeats the count but this time with counting three rice plants – 1, 2, 3 and instead points to the places in her left arm where the rice plants would go (Section three and Image strip 3 below). The first one would be the tips of her middle finger, slightly further down on her forearm and then her elbow.

Image strip 3: Pointing to the three rice plantings as count quantities on a number line



When asked why these spacings in particular, Grandma begins by mentioning that when the plant grows up, it becomes bigger and if we plant them closer together, it will be too crowded. (เวลาต้นข้าวมันโตขึ้นมามันกอใหญ่เนอะ ถ้าปลูกใกล้กันไม่ได้ค่ะ). There is a thinking with futurities of the rice plant, and seeing rice within its cycle of growth in its lifetime, how it grows and gets bigger and also rice within larger rice cycles and seasons as this is the sowed rice season for sale – the second harvest of the year.

Similar to Ti, embodied mathematics involving patterned spacing of the rice plants using palm-spacings was also part of larger ethics of reciprocity and responsibility to rice and also to intergenerational relations within their family.

This episode with the similar counting patterns – interval spacings and count quantities on a number line are further placed within other relations such as seasons and cycles of rice and a variety of counting systems.

Episode 2: Mathematics within Family and Cultural Roles and Responsibilities.

In the above episode, Grandma notes that this rice is ข้าวหวาน – sowed rice which is part of the timed patterns and seasons. Later in the conversation, Grandma distinguishes the rice planted within the season, she says there are two seasons for rice planting:

- First time (July – November/ December): นาปี - Na Pi is for themselves, their own family to keep, dry, and eat.
- Second time (January – April/May): นาปัง – Na Pang for sowed rice (raw) to sell

The one currently in the field is the second time, นาปัง the sowed rice that will be sold later.

Within this conversation, Noi shares about the role that Mali could play in family life. Their conversation is below:

<p>น้อย Noi</p>	<p>ให้หนูมีหน้าที่ช่วยกัน ช่วยเลี้ยง น้องใช้ไหม หรือว่าตากผ้า คุณยายซักผ้าเสร็จแล้วหนูมาตาก อย่างเนี่ย</p>	<p>1. It gives you a role to help out. Help to raise your 2. young siblings right or to hang clothes out to dry. 3. Grandma washes the clothes and you can take it 4. out to dry.</p>
<p>ยาย Grandma</p>	<p>ค่ะ ช่วยเนอะ ยายก็ต้องไปทำ อย่างอื่น</p>	<p>5. Yes, help out so that I can do 6. other things.</p>
<p>น้อย Noi</p>	<p>ใช่ค่ะ แล้วคุณยายก็ทำอย่างอื่น แบบนี้ค่ะลูก มันเหมือนเป็นสังคม ที่เล็กที่สุด แล้วหนูก็จะสามารถ เอาไปปรับ พัฒนาเนอะ การ ออกแบบ Tema ของหนูได้ใช่ ไหมลูก หรือความรู้เรื่องนาปีนา ปังเมื่อสักครู่นี้ โห้ย ครูน้อยไม่ใช่ รู้นะ เข้าใจใช่ไหม</p>	<p>7. Yes, so that grandma can do other things 8. right child? That (Family) is like the 9. smallest society and then you can take it 10. and adjust it to develop it to design a 11. Tema of your own, right 12. child? Or a topic about Na Pi and Na Pang, that 13. pair, I didn't know about that. 14. You understand right?</p>

In this conversation, Noi responds that the knowledge that Grandma has given us, gives us a role to help with washing clothes, or taking care of our siblings. Grandma then extends Noi's idea to say that them taking up these roles then allows her to do other things. Noi suggests to Mali that by learning the practice of rice planting and growing can be a way to contribute to family life and even take over roles within a family, the smallest unit in society.

While Mali nods as Noi shares this with her, Mali seems to take this up in an even broader sense after the designing with homelands event at Sahasat. Mali shares about a sense of responsibility extends beyond her family but to concerns around the cultural practice itself and the slow decline of it that she notices in society. When Mali responds to why she wanted to share this practice with her teacher at school, she says that:

เพราะว่าปัจจุบันก็ไม่ค่อยมีใครทำอย่างนี้เยอะ อนาคตอาจจะไม่มีการทำนาเลยก็ได้...จะได้แบ่งปันกับคนที่ไม่เคยได้ทำ หรือว่ากำลังความคิดแตกต่างกัน ให้เขาได้รู้ว่าเป็นประเพณี (ไทย) ตั้งแต่สมัยก่อนว่า ตังนานแล้ว การทำนา...คือการได้แบ่งปัน ความรู้แก่เพื่อนๆ และคนอื่น และก็ครอบครัวค่ะ เพราะว่าจะได้พัฒนาต่อเนื่องกัน”

Nowadays there aren't that many people who do rice farming like this. In the future, it is possible that there will be no rice farming anymore... so it is possible to share this with those who might never have grown rice before, or to share with people who have different ideas so they know that this is a Thai tradition since a long time ago, from way back, how people have farmed rice... sharing this knowledge to friends and other people and also families, that this can keep developing.

For Mali rice as an important plant, crop, and tradition. Through stories of her family working and playing by the rice fields, these land and practice have life (Marin & Bang, 2018). She expresses a worry about the decline in rice cultivation and “that we will not have anyone to “cultivate rice anymore.” Thus mathematics measurement of rice plant spaces is embedded with multiple times - in relationship to rice “since a long time ago” and how Mali wants to makes sure gets carried forward so that it can “keep developing”. Mathematics here for Mali is a way to observe land, engage with planting rice clusters, and ensure the continuance of rice cultivation. It was a way for her to nourish, and be nourished by family life and historical culturally practices, and ensure the continuation and flourishing of her family's way of life into the future.

Episode 3: Rice weights and measurements

Similar to Ti, Mali's family also cultivated one cycle of rice for sale, the Na Pang cycle that occurred in January till May. Alongside family relationships and responsibilities, mathematics was also part of families' participation within capitalistic systems of production and consumption with these land based practices. This episode begins with me asking, “How do you know how much you can sell the rice for?”

เมซี่ Meixi	แล้วรู้ข้าวขายได้เท่าไรหรืออย่างไรคะ	1. How do you know how much you can sell the rice for?
น้อย Noi	การคำนวณการขายข้าวอะคะ	2. Measuring how much you can sell rice for.
ยาย Grandma	ขายข้าวแต่ละปีมันไม่เท่ากันเนอะ มันมีข้าวปลูกเนอะ มันก็ได้น้อยเนอะคะ ถ้าข้าวมันถูกเนอะ มันก็ได้น้อยเนอะคะ แต่ปีนี้ยายขายได้ไป 6500 อะคะ	3. Selling rice every year is not the same. 4. The rice seeds for planting (the kind of rice they sell), we don't get much. If rice is cheap, we don't get that much. But this year grandma got 6500 Baht (per ton).
น้อย Noi	จะ	8. Yes.
ยาย Grandma	แต่ถ้าข้าวแพงก็ได้เยอะ	9. But if rice is expensive then we get a lot.
น้อย Noi	คะ	10. Yes.
ยาย Grandma	แต่ปีนี้ยายขายได้ไป 6500 อะคะ	11. But this year grandma could sell it for 6500.
น้อย Noi	6.50 ต่อกิโลกรัม	12. 6.50 Baht per KG
ยาย Grandma	6.50 ต่อกิโลกรัมคะ	13. 6.50 Baht per KG
น้อย Noi	แล้วตวงอย่างไรคะ หรือให้เขาชั่งเอง	14. So how do you measure it? Or do you give it to them to weigh?
ยาย Grandma	ชั่งเป็นลํารถเนี่ยคะ	16. The weigh is a vehicle
น้อย Noi	ลํารถ ที่เขามารับเที่ยวหนึ่งอะนะ	17. The vehicle weight came in one trip?
ยาย Grandma	คะ ไปชั่งที่ลํารถอะคะ	18. Yes, to weigh it with a vehicle
น้อย Noi	ชั่งเป็นลํารถนะคะ	19. The weigh is a vehicle.
ยาย Grandma	ใช่คะ จะคิดเป็นตันนะคะ	20. It is calculated into a ton unit.
น้อย Noi	มันก็มีเครื่องคิดเป็นตัน	21. It's calculated into a ton unit.
ยาย Grandma	คะ กิโลกรัมละ 6500 ที่ยายขายไปเนอะ	22. Yes. A ton for 6500 Baht is what I could sell it for. 23.

Grandma here recounts the amount of rice she could get from last year as 6500 Baht per ton of rice. Numeracy and mathematics for Mali's family were occurred 10 times with mathematics. As shown in Episode 3, mathematics as a way to measure ratios between kilograms and tons (Lines 9, 14-15, 16-17, 22-23, 24-25), the creation of "ton units" (Line 22-23) when measuring rice, and the use of vehicle weights (line 18-19) were routine parts of how mathematics was used from within these buying and selling practices of the family. Within this, grandma also knows that these prices are never static, that "each year is not the same" (Line 4) knowing that buying and selling were also dependent on a variety of factors, including land. Episode 3 gives a quick insight into how mathematics was used and talked about around buying and selling and we examine this episode closer in Episode 4.

4.7.3 *Storywork*

Episode 4: I didn't see the receipt

The next episode complicates the ways the Hom family navigate their participation in multiple systems – family and cultural knowledges with land and economic systems of markets and capitalism. Also of particular interest in this episode is first, my own slips into extractivism-assimilation paradigms and second, how I began to understand ways to participate in economic activity that are not predicated on capitalistic consumption and production.

Even though I tried to be explicit in understanding mathematics within its relationships, I was still looking out for the “mathematics” in our conversations. At the end of our walk, I couldn't help but ask, wanting the family to make more explicit the math that they were using throughout the walk. I ask two questions that are evident of how I was trying to get at the mathematics as an end in itself. Among other questions, I asked these two: (1) แล้วปลูกข้าวต้องคำนวณอะไร “and for planting rice, what do you need to measure or calculate?” and (2) แล้วรู้ข้าวขายได้เท่าไรอย่างไรคะ “how do you know how much you can sell the rice for?”

Continuing from episode 3 above, in my eagerness to show how families were doing mathematics at home, I remembered my own desires to show mathematics in home life was a main driver of these questions. The first questions clarified how palm-widths were used in planting rice and the ways in which the grandchildren were observing and pitching into family endeavors through the mirroring of hand movements (Rogoff, 2003; Rogoff, Alcalá, et al., 2014).

The second question, however, reflected my own capitalistic assumptions about rice costs and market prices. The development, rise, and wide-spread use of the numerical counting system, was in relation to the sociocultural changes and circulating trade across communities and the need to quantify about exchange of resources. Scholars have as studied this in one form in Papa New Guinea with the Oksapmin, the change and continuity of mathematical practices with numeracy within capitalistic systems (Kalman & Solares, 2018; Saxe & Esmonde, 2005; Saxe, 2014). Mathematics is steeped in capitalism and financial exchanges. For me, it was so easy to slip back into that mode of thinking when we begin to start with mathematical ends. To the question: “แล้วรู้ข้าวขายได้เท่าไรอย่างไรคะ how do you know how much you can sell the rice for?” Grandma's response however showed me other ways to think about economic exchanges. She says,

Noi: แล้วได้เท่าไรอะคะ 8 ไร่เนี่ย How much money did you get from 8 rai?

Grandma: ขายก็ไม่ได้ดูใบ ใบอยู่ที่ ขายเก็บไว้แล้วนะ
I can't remember. I didn't see the receipt. The receipt is... I kept the receipt already.

While rice was a source of income for the family, the amount of income was not the main fixation for Grandma or the family, so much so that Grandma does not remember how much their rice grain was sold for. Rice was less of a resource and a commodity but rather part of an important familial relationship and cultural practice that extended beyond capitalistic or economic gain. While my question held the base of capitalistic control and seeing rice as a commodity for the economic income of the family, Grandma shows how this was of less importance than what rice – the growing, harvesting, the grain itself - meant for the family. Through storylistening to her again, I am reminded of her teachings that there are ways to participate in economic production without operating from within capitalistic paradigms.

4.7.4 *Summary of the Case of the Hom Family*

Across three episodes, the Hom family shares stories of their relationships to rice and each other. Mathematical understandings were interwoven within relationships to rice growing, its cycles and seasons, family and cultural responsibilities and roles, as well as stories and memories of the family working together in the rice fields. My own probing about mathematics within capitalistic contexts were met with responses that made illuminated ways forward to understand mathematics, while verbally connected to buying and selling (See Figure 4.3), within axiologies that refused capitalistic paradigms. It was clear that the Hom family was concerned with mathematics from within familial and cultural roles and responsibilities – their grounded axiologies around what they felt was important to sustain their family's identity and their relationship with rice into the future.

4.8 SUMMARY OF FINDINGS

The Paj and Hom families were teaching me that mathematics was embedded in larger systems of relationships that were meaningful and powerful for them. Often, mathematics was a way that young people such as Ti and Mali were learning about their responsibilities to community futures and the ethical qualities of these systems of relationships. Mathematics was interwoven into

practices to remember, maintain, and expand families' axiological grounds towards the ends of community flourishing of ancestral, mango, rice, and family relations.

While these two land-based subsistence practices also intersected with infrastructures of production and consumption (use of pesticides, buying and selling rice), it seemed that families' stories made visible their ethical commitments to maintain and advance their systems of relationships with lands and each other. Families' grounded axiologies guided how they engaged with discourses around buying and selling rice, using pesticides in the mango fields, refused capitalistic paradigms, and maintaining gifting relationships with us visitors to their homelands. These two cases help us also push back against notions of purity (Konsmo & Recollect, 2019) by illuminating how families navigate heterogeneous kinds of knowledges and systems – familial responsibilities, economic systems, pesticide use etc, while still being first guided by their practices from within their axiologies and relationships with lands. Instead of binary relationships across familial knowledge systems and responsibilities and systems of production and consumption, these cases show the dynamic and nuanced ways that families navigate heterogeneous axiologies with mathematics and how mathematics can contribute to the nourishment and flourishing of communities and important teachings of young people's reciprocal relationships and responsibilities.

4.9 DISCUSSION

Mathematics education is an issue of socio and ecological justice (Aguirre & Civil, 2016; Barajas-López & Bang, 2018b; Rochelle Gutiérrez, 2017; Gutstein, 2009; Ladson-Billings, 1997; Danny Bernard Martin et al., 2010). To begin refusing mathematics based in whiteness and supremacy, Rochelle Gutiérrez (2017) suggests we “look outside of ourselves” so that “we challenge where leaning should take place and with what guiding principles, and that we rethink whom our new teachers might be” (p. 14). I suggest that we look to land and to families that understand mathematics as interwoven within land-based, grounded axiologies, as a potential way forward. These families have shown how family axiologies and mathematics can be reciprocal: (1) grounded axiologies are dynamic and shape how mathematics is used within community/local/economic/global contexts and (2) mathematics can also be an important tool to enact and advance these grounded axiologies. Seeing the “mathematics” without taking into account the axiological grounds from which they exist might result in slipping back into

intellectual extractivism and assimilation where Indigenous mathematics is made to “fit” into existing forms of knowledges that reproduce dominant relationships of power (Barajas-López & Bang, 2018b).

Furthermore, the Paj and Hom families show how families are always navigating multiple systems and overlapping constellations of practices imbued with power – school systems, family and community practices, economic and political structures, and land-based systems of knowing. These two cases also illustrate how families’ axiologies are fluid, responsive, and dexterous. As families moved across activity systems, they showed how their grounded axiologies were their *first* guides. This was the baseline by which they were engaging in mathematical practices as well. Understanding families within these complexities is also important to push back on purist notion of family practices and how they are always changing, contested, and dynamic and responsive to the microgenetic, ontogenetic, and sociocultural changes that they shape and are shaped by.

In thinking the design implications for educators who are increasingly designing disciplinary curriculum with homelands, it is key to design with and through families’ axiologies, their relationships with lands and stories. I posit that walking and storying lands with families allowed us to attune ourselves to families’ grounded axiologies, their systems of relationships from which they understand what is true and valuable. Without storylistening to their axiologies and taking that into account, we risk building extractive educational designs from Indigenous and nondominant communities that perpetuate systems of oppression and dominance so common within school systems and colonial logics of modernity (Mignolo & Tlostanova, 2006). When instead, we should be understanding mathematics in ways that helps strengthen Indigenous and nondominant families’ collective continuance, the ethical commitments in their relationships that ensure that their lifeways flourish into the future (Whyte, 2017). As a teacher myself, it was important to remember these systems of relationships that are ever-present in student’s lives.

Mathematics can kill and can also be beautiful ways to make meaning of family and community relationships (D’Ambrosio, 2009). It can be a tool to continue to engage with each other and the world in life-giving ways. Ti and Mali gave us examples of generative, restorative forms of mathematics that contribute to a community’s collective continuance. They and many others can help push back against powered binaries in mathematics based in white supremacy and hierarchy, extractivist-assimilative tendencies with designing with families, and start building mathematics from a different ground.

ARTICLE 3

Chapter 5. STORYWORK OF DESIGNING WITH HOMELANDS: SOCIAL POETICS AND POSSIBILITIES TO REIMAGINE SCHOOL FROM WITHIN TEACHER-STUDENT INTERACTIONS

5.1 INTRODUCTION

These are critical times in human history. With the increasing collapse of our socioecological democracies, now more than ever, we need systems of learning that expand our human capacities to ensure the flourishing of diverse forms of life. Indigenous communities have always done this, sustaining and advancing their place-based knowledge systems – their “vibrant relationships between people and their ecosystems” (Battiste, 2002, p. 42). With the onset of wide-spread schooling, these however, these are often met with centralizing global forces that narrow definitions of success and development (Bang et al., 2012; Battiste, 1986; Illich, 1971; Marker, 2006; Mignolo, 2007; Paine & Zeichner, 2012; Barbara Rogoff, 2003; Tabulawa, 2003; Tatto & Plank, 2007). This paper explores how attending to the ethical qualities within everyday relationships and interaction through a practice call *Tutoría*, carries broader implications for how we re-make or re-mediate the world – in particular, the worlds of school and home towards Indigenous family futures (Cole & Griffin, 1983; Gutiérrez & Vossoughi, 2010).

Tutoría is a system and practice of teaching and learning that originated in Mexico since the 1990s (Cámara, 2003; Cámara, Castillo Macías, de Ávilas Aguilar, et al., 2018; Rincón-Gallardo & Elmore, 2012). *Tutoría* emphasizes learning through convivial dialogue, that is, through dialogue based in mutual concern for the self-determination of the other and radical interdependence (Cámara, 2003; Illich, 1973). *Tutoría* classrooms are “communities of learners” (Brown & Campione, 1998) where each person (student, teacher, parent) learns through joint dialogue on a topic (sometimes called *Tema*) of mutual interest and attention. After both the tutor and learner are satisfied, the learner then gives a public presentation of what and how they have learned to a larger group, typically involving families, the larger community, and sometimes other

schools. Finally, the learner has the responsibility to teach to another person who is interested to learn that same Tema. Thus, the roles of tutor and learner are constantly exchanged throughout the network. Who teaches and learns is not based on assigned “student” and “teacher” roles but students are often tutors to their peers and even adults. Tutoría intentionally shifts powered relationships of expertise among teachers and students to problematize who holds and produces knowledge.

In this sense, Tutoría intervenes to re-organize public school education reforms that continue to be tied to projects of colonization, control, and consumption. While Tutoría has grown to other countries such as Singapore, Chile, and Argentina (Cámara, Castillo Macías, de Ávilas Aguilar, et al., 2018), heterogeneity is built into the model such that Tutoría is designed and driven by those that practice it. This paper draws from a case study of an urban Indigenous school called Sahasat school in Thailand where we (students, teachers, and researchers) extended the Tutoría model to design pathways home from school. Using the lens of *social poetics* to understand dialogic interactions in Tutoría and our iteration at Sahasat, I explore what *possibilities* are expanded or foreclosed for young people and teachers at school. I find that both (1) designing for shifting relational activity through Tutoría and (2) designing pathways home through land-based practices have implications for how students and teachers begin to re-imagine, humanize, and remediate their worlds of school and home. This paper adds to growing body of literature in the learning sciences that focus on the ethical and political dimensions of learning (Bang et al., 2015; Bang & Vossoughi, 2016; Booker et al., 2014; Esmonde & Booker, 2016; Gutiérrez & Jurow, 2016; Lee, 2008; Marin & Bang, 2015; The Politics of Learning Writing Collective, 2017; Vossoughi et al., 2018; Zavala, 2016) with explicit attention to teaching and learning with stories & land at school (Bang et al., 2014; Marin & Bang, 2018).

5.1.1 *School-Level Designs from Sociocultural Perspectives*

I intervene in public schools partially because of my background teaching in them as well as the stories that I continue to hear about settled²⁶ extractive-assimilative agendas in schooling that

²⁶ I use the word “settled” drawing from Bang, Warren, Rosebery, & Medin (2013) to refer to expectations based on whiteness that are embedded in systems that may “seem natural and objective rather than socially or ideologically constructed.” Within educational structures, the concept of *settled expectations* helps to “problematize entrenched, usually hidden, boundaries that tend to control the borders of acceptable meanings and meaning-making practices” (p. 303).

continue to impact the social and ecological flourishing of all forms of life (Bang et al., 2012).

From a sociocultural-historical view of schooling, school failure is systemic – “it is done in the classroom, it is done at home, it is done on the way from the classroom to home, it is done in the workplace, it is done everywhere” (Cole & Griffin, 1983; p. 71, Rose, 1989; Varenne & McDermott, 1999). Colonized relations in school are as much ideological, structural, and political, as they are interactional. Relationships of power and hegemony are socially constructed in moment-to-moment ways and play out in the ways that teachers hear, talk, see, and treat students’ ideas, cultural practices, and home lives (Erickson, 2004). At the same time, colonialism and neoliberal forms of global imperialism are not well-oiled machines, they are dynamic and contested (Lee, 2012; Tsing, 2005). Situated perspectives are useful in making sense of dynamic and contested nature of how (1) macrolevel systems, policies and beliefs filter down and are also impacted by microlevel interactions, and (2) how people make meaning, shape and are shaped by their participation in varied cultural ecologies across settings (Cole, 1996; Engeström, 2001; Gutiérrez & Rogoff, 2003; Lave & Wenger, 1991; Lee, 2008, 2012; Rogoff, 2003; Wenger, 1998).

Scholarship in the learning sciences has a history of work attending to and designing for educational change through microlevel moments of human activity (Alton-Lee, Nuthall, & Patrick, 1993; Bakhtin, 1984; Bang & Medin, 2010; Bang & Vossoughi, 2016; Booker, 2016; Brown, 1992, 1997; Brown & Campione, 1998; Cole, 2001; Cole & Griffin, 1983; Enyedy, 2003; Erickson, 2004; Goodwin, 2013; Gutiérrez & Orellana, 2006; Gutiérrez & Rogoff, 2003; Gutiérrez, Rymes, & Larson, 1993; Lee, 2001; Nasir et al., 2006; Palinscar & Herrenkohl, 1999; Rogoff, 2003; Rosebery et al., 2010, 2010; Vossoughi & Booker, 2017; Vossoughi & Gutiérrez, 2014; Vygotsky, 1978). Because learning contexts and educational settings are wrought with power (Esmonde & Booker, 2016; Lee, 2008, 2012; Nasir et al., 2014), “these dynamic relationships are important because they suggest that even hegemonic relationships of power such as those institutionalized in places like schools are not deterministic” (Lee, 2012, p. 350-351). This paper builds upon prior work by making visible how microlevel interactions have implications for how student and teachers re-imagine and re-design as a *school* towards Indigenous family and community futures. I suggest such school-level systems reorganization through designing pathways home with Tutoría is an axiological innovation in institutional relations where for

teachers, global and state-level demands began to lose power while family futures gained power and purpose (Bang, et al, 2015).

5.1.2 *Our*²⁷ *Design*

This paper is placed in a larger three-year participatory design research project in an urban Indigenous school in Thailand called Sahasat²⁸ that began in February 2015 (Bang & Vossoughi, 2016). In earlier iterations of our design, we focused on intervening in colonized relationships of teaching and learning to transform subject-subject-object relations with *Tutoría*– in this case, student-teacher relationships in the presence of an object of joint attention.

As described earlier, *Tutoría* here refers to a pedagogical system of teaching and learning that is practiced within a larger network of schools and communities. *Tutoría* as an instructional practice in public schools began in Mexico, known as *Tutorial Networks* or *Learning Community Project*, that then spread to Singapore, Thailand, Chile, Argentina, Perú and most recently Nigeria²⁹ (Cámara, Castillo Macías, de Ávilas Aguilar, et al., 2018; Rincón-Gallardo, 2015; Rincón-Gallardo & Elmore, 2012). I suggest that the *Tutoría* system of learning is based in a kind of apprenticing, experiencing, and practicing with *social poetics* because the learner and tutor are mutually co-sustaining an object of joint attention (Goffman, 1964). *Social poetics* (Katz & Shotter, 1996; Shotter, 2010) or *poiesis*³⁰ to refer to the practice of intentional attunement and everyday processes of creation within subject-subject interactions. Living and practices with social poetics invites “new shared forms of life” and the “‘making’ of a new ‘social world’” (Katz & Shotter, 1996, p. 928). It is a co-creation or co-sustaining of life forms together from felt experiences (Goffman, 1964; Kielian-Gilbert, 1994). I expand on this in section 5.2 in the Theoretical Framework.

Tutoría has been categorized as a counterhegemonic practice as it intervenes in the instructional practices of public schools to transform settled powered hierarchies within teaching and learning that otherwise foreclose possibilities of co-creation and mutually sustaining roles in

²⁷ I use “our” when describing the design to acknowledge its collective orientation, co-led with Sukanda Kongkaew, Panthiwa Theechumpa, Alison Ling, and Amornrat Pinwanna, and the many teachers at Sahasat school.

²⁸ The names used in the dissertation are pseudonyms, but the name of the school is not, as per request of the students and teachers who wanted their stories to be told.

²⁹ I locate myself as an actor in this spread to Thailand but do not go into detail about the other places.

³⁰ I use *poetic* and *poiesis* interchangeably in this paper even though some scholars make distinctions between the two, the *poetic* being how something is composed and *poiesis* the embodiment and the way that a piece is heard (Kielian-Gilbert, 1994).

dialogue (Rincón-Gallardo, 2015). Instead of instructional relationships of hegemony and dominance where teachers control who and what knowledge counts, a Tutoría relationship reaches to operate from the grounds of consent, respect, and reciprocity (Cámara, 2003; Cámara, Castillo Macías, de Ávilar Aguilar, et al., 2018; Rincón-Gallardo & Elmore, 2012).

5.1.3 *Brief History of Our design*

- In Year One, we focused on creating conditions by which Tutoría could flourish at Sahasat. This involved finding space to be in Tutoría relationships consistently with each other through learning design camps, classroom teaching teams, creating teacher learning teams and others (See Appendix A for list of design sessions).
- In Year Two (December 2016), as we continued to iterate and co-design in Tutoría, our design shifted significantly, when we began following six young people across the landscapes of homes and school. I use the word landscapes to include the 1) physical place, 2) historical constellations of cultural practices, and 3) knowledge systems of the place and their values, ethics and axiologies.
- In Year Three (May 2017), we began walking lands with the six young people's families as part of our design (See Article 2). In August 2017, we then organized a two-day session focused on designing with homelands. In this session, these same six students worked with their families to design a Tema based on an important family practice. Six teacher then paired up with a student and learned with this home-based Tema. Year Three represented a shift from just focused on dialoguing in Tutoría to designing with important land-based family practices on students' respective homelands. The stories from this paper come from the six teacher-student dialogues from the two-day session in August 2017.

5.1.4 *Research Questions*

Through an analysis of the six student-teacher dialogues, I explore what poetics and emplaced possibilities emerged from this session for both the young people and adults. I focus on understanding how young people and teachers transform their ethical stances around power as they learn and present on a student-designed Tema (lesson) based on important land-based practices from home. Through the lens of *social poetics*, (Katz & Shotter, 1996; Shotter, 2010),

I ask:

1. How and in what ways are subject-subject-object relations transformed with designing with homelands in Tutoría?
2. What ethical and political emplaced possibilities are foreclosed or expanded for the young people and their teachers?

Using the framework of social poetics and poiesis, I explore how new forms were co-created at two levels. First, I look at emergent forms and possibilities at the level of utterance, epistemology, and discipline within Tutoría dialogues and their Temas (objects of inquiry). Second, I look at how this first two-day event to *design with homelands* with 6 students and 17 Tutoría teachers was a kind of ongoing, prefigurative co-creation in unfolding moments at Sahasat (Vossoughi & Booker, 2017; Yates, 2015). This event is of interest because it introduced new forms of designing with homelands, led by young people at school – expanding on both the Tutoría practice and land-based work in school. Furthermore, this event seemed to have implications on how teachers imagined forward their role in relation to community futures, and how they designed other programs at Sahasat. Since this two-day designing with homelands event, teachers have organized curricular designs, teacher professional development sessions (October 2017, November, 2017, July 2018), and all-school Tutoría fiestas (March 2018, December 2018, October 2019) that center students and teachers’ stories, practices, and knowledges from their home communities. For these reasons, examining what happened during the first designing with homeland session over two days and how subsequent possibilities were expanded, is of interest.

5.1.5 *Local & Global Contexts of Design: Sahasat School & Indigenous education in Thailand*

After being part of the Tutoría team in Mexico in 2011, I began to do similar work in Singapore and Thailand, both out of my interests and at the request of my former colleagues and educators. In February 2015, I invited and co-organized a Tutoría camp and pilot at Sahasat to see if the teachers would want to try Tutoría out at their school. Sahasat school is a private welfare educational school (โรงเรียนเอกชนการกุศลประเภทการศึกษาสงเคราะห์) for urban Indigenous children in Chiang Rai, Thailand. Sahasat’s students come from around 13 different ethnic groups: Akha, Lahu, Karen, Hmong, Lisu, Yao, Chan, Thailue, Lawa, Chinese, Khmu, Plang, and Northern Thai. Most of these groups are highland tribes and with the exception of the Northern Thai

students, are part of the 42 currently registered ethnic groups in Thailand, according to the National Council of Indigenous people in Thailand, with a population totaling over 4 million in the country (Prasit & Meixi, 2018). Sahasat, as an accredited school, has to follow the national curriculum, take a special focus on teaching Thai to their students for translatability in the city, teaches English on top of that, as well as tries to have students maintain their tribal identities.

Sahasat is a sociopolitical space, shaping and shaped by “intersections of multiple networks shaping cities, communities, schools, pedagogies, and teacher and student practices” (Leander, Phillips, & Taylor, 2010; Nespors, 1997, p. xiii). These are often complex and contested, particularly within Indigenous education in Thailand (Prasit & Meixi, 2018). On one hand, compulsory state education had tried to assimilate diverse ethnic-linguistic groups under the blanket of “Thai-ness” or *ความเป็นไทย* (Keyes, 1991). “Thai-ness” - speaking Thai, practicing Buddhism, and loyalty to the Thai state - reflects the importance of ethnic homogenization in nation-building and modernization, where heterogeneity is a threat to national security and nationhood (Laungaramsri, 2003). On the other hand, Thailand has provisions to decentralize the national curriculum since 1999, legislating that 30% of curriculum should be provided and developed by the local community (Kwanchewan & Prasit, 2009).

This is further complicated by global narratives of modernity and settled structures of power in assembly-line schooling (M. Bang et al., 2012; Brock-Utne, 2000a; Kwanchewan & Prasit, 2009; Mignolo, 2007; Barbara Rogoff, 2003; Santos, 2014). Ideas of “modernity” emerged from Europe in the seventeenth century to refer to social and knowledge system organization that saw itself as the “center” and imposed itself throughout the world (Mignolo, 2007). Schools facilitated its expansion. Colonized relations in school control who teaches and learns through singular measurements of what counts as success and permissible sense-making, how bodies are regulated and disciplined, and the de-placement of learning from within meaningful contexts on lands and with families (Archibald, 2008; Bang et al., 2014, 2012; Battiste, 1986; Brayboy & Castagno, 2009; Marker, 2006; Nespors, 1997; Rogoff, 2003, 2014; Rogoff, Paradise, Arauz, Correa-Chávez, & Angelillo, 2003; Santos, 2014; Simpson, 2014; Tuck, McKenzie, & McCoy, 2014). In Thailand, schooling has been complicit in removing Indigenous children from their homelands, languages, and knowledge systems in order to participate in a “superior present” (Kwanchewan & Prasit, 2009). In fact, such severing and fragmentation of relationships with land is deemed desirable and necessary for children to “progress” towards narrowing definitions of

modernity and capitalistic production. Thus intentionally reconnecting with homelands in our designs and shifting how we are in relation with one another directly refuses colonial narratives and agendas in Indigenous education in Thailand.

5.1.6 *Designing with homelands as a potential way forward*

For purposes of this paper, designing with homelands includes home and lands in all its complexities and multiplicities of relations, times, and places, in areas named ‘urban’ and ‘rural’. Designing with homelands has long been of interest to educators like myself who are interested in the ways in which people move across and within settings in ways that actively refuse and re-mediate the boundaries of home and school (e.g. Bang et al., 2014; Bang & Vossoughi, 2016; Bell, Tzou, Bricker, & Baines, 2013; Engeström, 2001; Gutiérrez, 2008; Ishimaru et al., 2019; Paris & Alim, 2017). Designing with homelands can take a variety of forms: family-and-community based designs at school (e.g. Bang, Marin, Faber, & Suzokovich, 2013; Bang, Montaña Nolan, & McDaid-Morgan, 2018; Baquedano-López, Alexander, & Hernández, 2013; Bryk, Sebring, Allensworth, Easton, & Luppescu, 2010; Ishimaru et al., 2019, 2016), community-based curricular designs (e.g. Aguirre & Zavala, 2013; Gay, 2018; Lipka et al., 2005; Moll, Amanti, Neff, & Gonzalez, 1992; Paris & Alim, 2017; Zeegers, 2011), and community-based teacher education (Cuban, 1969; Ginsberg & Craig, 2010; Hyland & Meacham, 2004; Zeichner & Bennett, 2015).

On a curricular level, there has been long-standing work that sees home and community life as important resources for learning at school with students’ funds of knowledge (Gonzalez et al., 2005; Moll et al., 1992), to make visible the linguistic and cultural complexities of nondominant communities (Gutiérrez, Baquedano-López, & Alvarez, 2001; Gutiérrez, 2008; Heath, 1983; Lee, 2001, 2008; Nasir, Rosebery, Warren, & Lee, 2006; Nasir et al., 2014; Rogoff, 2003), and how culturally relevant pedagogies (Ladson-Billings, 1995), culturally responsive pedagogies (Gay, 2000, 2018), and culturally sustaining pedagogies (Paris, 2012; Paris & Alim, 2017) are important for the teaching and learning that bends towards justice and equity for more humanizing forms of learning. These approaches are concerned with refusing deficit models of thinking and the importance of maintaining their communities’ and cultures’ ways of knowing, speaking, doing, being while also gaining competencies in dominant ones (Ladson-Billings, 1995; Paris, 2012).

Another body of literature is concerned with how parents and families participate in schools (Bang, Montaña Nolan, & McDaid-Morgan, 2018; Bryk, Sebring, Allensworth, Easton, &

Luppescu, 2010; Cuban, 1969; Ishimaru, 2014; Ishimaru et al., 2019; Zeichner & Bennett, 2015). This literature articulates the need to broaden what counts as family engagement and build models of family leadership in systems of education that are not based in white, assimilative norms so that schools better support the vibrancy and collective well-being of families and communities (Bang et al., 2018; Baquedano-López, Alexander, & Hernández, 2013; Ishimaru et al., 2019; Villegas, 2009; Zeegers, 2011). Furthermore, community contexts are important for community-based teacher education (Cuban, 1969; Ginsberg & Craig, 2010; Hyland & Meacham, 2004; Koerner & Abdul-Tawwab, 2006; Zeichner & Bennett, 2015), and for teaching and learning in Indigenous contexts towards self-determination (Archibald, 2008; Archibald, Nicol, & Yovanovich, 2019; Bang, Montañó Nolan, & McDaid-Morgan, 2018; Brayboy & Castagno, 2009; Lipka et al., 2005; Simpson, 2014; Smith, 2002; Villegas, 2009). From these perspectives, Indigenous families are the “foundation for healing and education” (Bang et al., 2018, p. 9-10). Collaboration with communities to co-design and lead school change is then fundamental to strengthen intergenerational relationships to lands and to each other, as acts of renewal and remembering Indigenous ways of knowing and being (Bang et al., 2018; Ishimaru et al., 2019; Simpson, 2014).

In the six cases here, lands included the stories, relationships, practices, materiality, histories, hopes, futures, and axiologies – ethics and aesthetics of communities that these young people called home (Bang et al., 2014). Designing with homelands for us involved young people (re)storying their homelands and reclaiming learning relationships with land (Bang et al., 2014). Designing with homelands in Tutoría seems slightly distinct from other cases above in that it was student (and family)-led, with students teaching their teachers, leading and enacting epistemological (ways of knowing), ontological (ways of being), and axiological (ways of valuing ethics and aesthetics) connections home. In our case, young people worked with family members to design their Temas but we did not directly involve families in decision-making processes in school³¹. The central concern of this paper thus examines the ways these lessons from homelands played out at the level of interaction between teachers and young people, and what possibilities they afforded or constrained for reimagining school towards Indigenous futures at Sahasat.

³¹ Involving parents as co-designers has been proposed several times in our subsequent designs but we have not yet implemented this as of 2019.

5.2 THEORETICAL FRAMEWORK

5.2.1 *Sociocultural understandings of learning & Cultural Historical Activity Theory of School*

This work has roots in sociocultural understandings of human learning and development, situated in cultural historical activity theory (CHAT) (Cole, 1996; Engeström, 2001; Vygotsky, 1978). From such perspectives, humans make meaning by participating in constellations of cultural practices that are dynamic, contested, varied, and situated in historical and social lives (Gutiérrez & Rogoff, 2003; Lave & Wenger, 1991; Lee, 2008; Rogoff, 2003; Wenger, 1998). Culture then, is far from ‘box models’ but are lived by human carriers in the participation in sociohistorical practices that shape and are shaped by human interaction and activity across contexts (Engeström, 2011; Engeström, 2001; Gutiérrez & Rogoff, 2003; Gutiérrez, 2008; Lee, 2002, 2017). Practices and the larger cultural historical activity systems they are embedded in, also reflect a particular epistemic, ontological, and axiological orientations (Bang, 2015).

In this way, learning is socially and historically situated, cultural, changing, and maintaining regularities through jointly shaped goals and contexts (Bang, 2015; Cole, 1989, 2008; Lave & Wenger, 1991; Nasir, 2002; Nasir, Rosebery, Warren, & Lee, 2006; Rogoff, 2003; Saxe, 1999). Participation in cultural historical activity systems thus are part of human development over microgenetic, ontogenetic, and sociogenetic scales where humans are making sense of the world in everyday ways, all the time (Bang, 2015; Cole, 2005, 2008; Nasir et al., 2006; Saxe et al., 2009).

Historically, analysis of learning within activity systems have been primary focused on the expansion or transformation of the object (Cole, 1996; Engeström, 2001; Vygotsky, 1978; Wertsch, 1991). The object is the organizing goal of the collective activity system, defined and shared by the participants in it (Engeström, 2001). The object is distinct from shorter-lived goals or actor specific learning from those actions. The *subject* is the “imported” into a study. They can refer to an individual or a subgroup whose position or point of view is the perspective of analysis (Engeström & Sannino, 2010). Intervening in the colonized relations of public schooling, this paper and analysis of Tutoría adds to a growing body of literature that tries to expand relation-focused activity (Bang et al., 2015; Bang & Vossoughi, 2016; Vossoughi & Booker, 2017), where the transformation of subject-subject relations has important implications for not just the expansion of the object, but the subject-object relations.

5.2.2 *Social poetics & Storylistening within Subject-Subject-Object relations in Tutoría*

Poetics or *poiesis* refers to the idea of making or creation in living moments (Kielian-Gilbert, 1994; Shotter, 2010). Social poetic as a framework builds on Bakhtin's (1984) idea of dialogic relations at the level of the utterance (Shotter, 2010). The practice of social poetics is learning to be responsive to living events so that these *place* us in our surroundings and in relationship to such events so that they do a work in us, what Shotter (2005, 2010) calls "witness thinking". From Indigenous methodologies, it is a kind of storylistening (Archibald, 2008). Storylistening and living with social poetics is the ethical dimension of communication which is part of "closing the distance between self and other", so that "our being is a being *with*" (Freire, 2000; Zavala, 2018). The ways that we speak, be, and listen has the potential to close the gap between the self and other is in the very grammar of our intersubjectivities and interactions (Erickson, 2004; Goffman, 1964, 1983; Gutiérrez, 2008; Levinas, 2005; Vossoughi, Jackson, Bang, Warren, & Rosebery, 2018). By extension, how teachers see, extend, listen to young people is at the heart of poetic possibilities.

I find the framework of social poetics/storylistening useful in understanding Tutoría dialogue. A social poetic frame of (1) introduction of new forms, (2) felt dynamics, and (3) emplaced possibilities helps us attune to the continual unfolding of living moments, to understand how talk and interaction are ecological sites of co-construction, mutual sustaining and orienting (Goffman, 1964), and what possibilities are afforded through them. Tutoría is a momentary face-to-face encounter, a gathering where "two beings find themselves in another's immediate presence" and "jointly ratify one another as authorized co-sustainers" of an object of mutual attention (Goffman, 1964, p. 135) – in this case, the object was centered in six homeland practices of the young people. Teaching, a normally dominating and controlling endeavor in classrooms becomes a "meeting of freedoms" (Stiener, 1987 as cited in Shotter, 2010, p. 90). I go through this cycle of three phases or interrelated moments below:

(1) Introduction of New forms and conditions

Social poetics occurs with and through difference. When two beings come together in dialogic relations, it "introduces totally new elements into his discourse; it is in this way, after all, that various different points of view, conceptual horizons, systems for providing expressive accents, various social 'languages' come to interact with one another" (Bakhtin, 1981, p. 282). Similar to experiencing a work of art, a poem, a landscape, "social poetics are utterances-experiences that

arrest us, resonate with us, and draw us to respond; in our responding, we in turn relate ourselves to them (Katz & Shotter, 1996).

These new forms are made possible in “open dialogue” (Shotter, 2010, p. 137- 138) where there are conditions of mutual freedom, respect for the otherness of the other and of place, and reciprocity or *chiasmic* from within intertwined and reversible dialogue. These are also the basic tenets of Tutoría.

(2) Felt dynamics and Expressed resonance

Attunement to the social poetics of our everyday lives leads to moment two – when subjects “‘dwell on, with, or within’ them (the new forms) for a while, gradually gain an orientation toward them as their ‘inner nature’ becomes familiar to us” (Shotter, 2005, p. 46). Drawing from felt theories, felt dynamics are “active, embodied, narratives practices,” important grounded community knowledges that speak back to settled knowledge domains or claims (Million, 2009). Moving in accordance with the other requires us to cultivate a sensitivity, responsivity and receptivity to living utterance-events within a unique local context and a unique grounded moral order (Katz & Shotter, 1996).

Felt dynamics within social poetics is much like story listening (Archibald, 2008), where such a practice requires understanding speech as part of living, interactive processes that are responsive and reacting to each other, not just reporting or knowing *about*. In the interstitial spaces of our talk, we are creating relationships, and creating new relational forms of life (Shotter, 2010, citing Wittgenstein, 1953).

(3) Emplaced possibilities: Emergence of new heterogeneous possibilities, and new planes of being as we are placed in our surroundings

Shotter explains, “For, to be stuck or arrested by another’s words, is not just to understand them in terms of a single kind of connectedness, so to speak, to fit them into an already well-known, single form of life – thus merely to celebrate its rule over all else – but to find oneself resonating to a whole multiplicity of other, many quite new possibilities” (Shotter, 2010, p. 45). With social poetics, possibilities are not foreclosed, but expanded.

Subject-object relations can expand when we begin to see ourselves in new relations to the object. We then understand “a human being's absolute need, for the other, for the other's seeing, remembering, gathering, and unifying self-activity—the only self-activity capable of producing

his outwardly finished personality. This outward personality could not exist, if the other did not create it: aesthetic memory is productive— it gives birth, for the first time, to the outward human being on a new plane of being” (Bakhtin, 1990, p. 36). Subject-subject relations to *emplace ourselves* in our surroundings open temporal and placed possibilities of new planes of being. In the flow of living moments, emplaced possibilities are temporary, provisional stabilizations that happen across a multiplicity of time-space relations and scales. At the level of knowledge systems, an edge of emplaced possibilities refers to epistemological, ontological, and axiological navigations across the landscapes of school and home (Bang & Medin, 2010).

5.2.3 *Poetic-Relational Ways of Being and Political Change in Schools*

This paper illustrates how social poetics/ storylistening within Tutoría can expand the purposes of schools in ways that mattered for teachers, families, and communities. Political change in schools is possible as these three interrelated moments are cyclical (See Figure 5.1). “New possibilities of relation are engendered, new interconnections are made, and new ‘shapes’ of experiences can emerge... In short we are spontaneously ‘moved’ towards specific possibilities for *action* in such thinking” – that is, new forms that move us to act can expand possibilities for other new forms to emerge (Shotter, 2010, p. 192, emphasis added). In the context of national and global discourses at school, these new forms can generate diverse new forms of life.

Co-creation in living moments

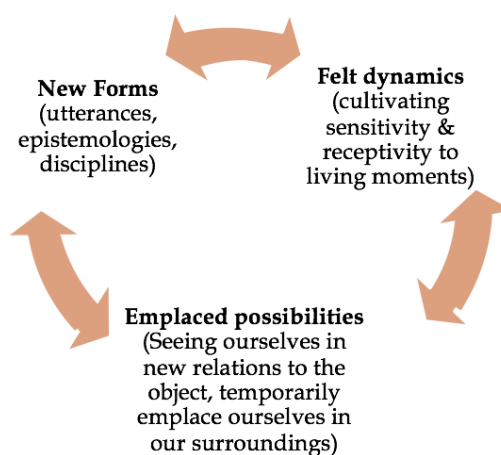


Figure 5.1. Social poetics in Tutoría as Analytical Framework

Furthermore, as teachers see, extend, and build on students' repertoires of homeland practices for expanded navigational possibilities of learning towards instead of singular ones based on colonial enclosure, it breaks "the grip that disciplinary forms of life have upon us". In particular, to be moved by what another is saying is a kind of relational-poetic that can hold possibilities of heterogeneous axiological innovations in schools – a shift in what we consider to be good, right, true and beautiful (Bang et al, 2015; Shotter, 2010). As a result, we too are more open to experiencing and seeing other possibilities of meaning-making and understanding for ourselves across diverse ways of knowing and being (Shotter, 2010). Social poetics helps us recognize that ethics and theory making are "endogenous to everyday human activity within the borderlands rather than as the "privileged domain of researchers" (Vossoughi & Booker, 2017, p. 226).

Schools with their content and curricular goals that reinforce increased homogeneity, do not hold enough space for divergent histories and selves to emerge, meet, and create new forms of life. In professional settings and schools in particular, we are socialized to focus on sustaining professional discourses, agendas, and forms of life and to forget our own everyday ways of orienting to the other and to our surroundings (Katz & Shotter, 1996). Social poetics makes visible how one cultivates a listening, sensitivity, responsivity and receptivity to living utterance-events within a unique local contexts to develop new ethical commitments and actions (Katz & Shotter, 1996).

5.3 METHODS

In this context, the central goals of our design was to first, shift powered, controlled, and settled forms of instructional practices to dynamic, consensual, and reciprocal ones in Tutoría and second, to expand the navigational possibilities across the landscapes of home and school for Indigenous young people and teachers at Sahasat. We conjectured that these goals were important to potentially shift how schools understood their roles in building Indigenous futures and the collective continuance of Indigenous families and communities.

5.3.1 *Data Collection*

Data here in this study consists of (1) video data recordings from six, hour-long dialogues between students and teachers, (2) photo artifacts of the work and reflections they produced together within their Tutoría session, (3) six public presentations of learning that teachers gave to the rest of the

group after their sessions, and (4) 12 ten-to-fifteen minute individual exit interviews with students and teachers, see Table 5.4 below for the summary of data.

Table 5.5. Summary of data collection

Activities	Time	Data collected	Notes
Student-teacher Tutoría dialogues	403 minutes (60 -80 mins each)	6 Videos, Artifacts	Temas were based in important practice from students' homelands. They included (1) Hmong cloth dyeing (50 mins) (2) Trap fishing (75 mins) (3) Akha games and toys (83 mins) (4) Tea from coffee husks (71 mins) (5) Volleyball (63 mins) (6) Rice planting and harvesting (61 mins) Artifacts included written notes, photos, and materials that students used for their Temas. Some examples include: bamboo wood for game-making, fish spears, and coffee bean husks.
Teacher presentations	144 minutes (20-30 minutes each)	6 Video, 6 Posters	Each teacher (adult-learner) worked with students to create paper posters of their learning experience and presented them to the larger group of 20 educators and 6 students. At the end of their presentations, the audience asks the presenter questions to clarify, extend, or link Temas or ideas.
Post-Tutoría interviews	145 minutes (10 – 15 mins each)	12 Videos	Teachers and students were interviews separately. These occurred the day of, or the day after the Tutoría sessions

Tutoría dialogues – Video and Artifact data. Each pair was video recorded for the duration of their Tutoría session, usually about an hour long. In most cases, the video cameras were left at the tables while I and the other members of the research and design team, Khun Sukanda and Khun Panthiwa stayed close to the cameras to see if the recordings were alright or if the cameras needed to be shifted or turned off (Vossoughi & Escudé, 2016).³² The hour-long sessions included the pair in dialogue and after concluding their conversation, a reflection by both the teacher (adult-learner)

³² While videos do not convey or evoke some kind of surveillance concerns in the Thai context, the intimacy of the conversations was at times made video cameras seem intimidating and/or intrusive. Video cameras however, have often been a staple at most of our meetings for the last two years and for the most part, they were seen as a democratic tool to study and record which is now taken by me to Seattle to be re-watched and analyzed.

and the student-tutor on their learning process. All six dialogues occurred at the same time, on the same day, and in the location of Sahasat school large meeting rooms. Through the course of the dialogues, four pairs stayed in a single location, sitting with each other. Two of the six pairs moved outside to work with bamboo in the school field and the video cameras followed them as they moved around.

Artifacts from the Tutoría dialogues included teacher and student written notes and reflections, photos and materials used in the Tema. In two of the cases, students and teachers worked together to make slit toys and fishing traps out of bamboo, and photographs of these were also taken.

Final presentations – Video & Artifact data.

Presentations that lasted 20-30 minutes were also recorded on video. These presentations often featured the teacher's learning process (how the Tema began, questions that were resonant with them), areas for further inquiry, and finally, a question and answer session from the audience.

Artifacts of the presentations included teachers' final posters and other materials such as the fishing spears and stilts.

Post-Tutoría interviews – Video data. At the end of the Tutoría dialogue, videos were also collected of each teacher presentation and twelve 10-15 minute exit interviews with each of the teachers and students. Interview questions included:

- How did you feel after the session?
- What did this practice mean for you and your family? Why was it important to teach?
- What was surprising or challenging?
- How is this connected to learning at school, in what ways?
- How they would like to see this work grow going forward?

5.3.2 *Analysis*

Units of analysis – Designing with Homelands in Tutoría Dialogues. The unit of analysis is each pair of student-teacher dialogues where students worked to design a Tema (an object of inquiry) based on an important practice from home, that they would then teach. There were six pairs in total. Leading up to this event, we had walked and storied lands with families in May 2017 (See Article 2) with the same six students, and also had a design session with these six young people in August 2017 led by Khun Panthiwa.

The Tutoría pairs were determined by mutual self-selection. Each student presented their Tema to the group of 17 Tutoría teachers and then the teacher who was interested in that topic would pair up with that student. The Temas were a kind of substrate – the organizational resource that can be preserved or transformed as the pair constructs meaning and action in interaction (Goodwin, 2013, 2017). Because we only had six students, only six teachers out of seventeen worked with a student at this event. While only six teachers had this experience, all 17 teachers practice Tutoría and subsequently designed to work with students’ homeland knowledges after this event (See Article 1 for more information). All other teachers then participated in the final learning presentations as audience members. Within the teacher-student pairs, four teachers already knew the students, while two others were meeting for the first. Three out of the six teachers were native teachers while the rest were Thai (Isarn) and Thai (Lanna) (See Table 5.6. for list of Temas by pair).

Within the pair, students were in the position of “tutor” meaning that they prepared materials, learning launches, and dialogue ideas to be shared with their learner, who, in this case were, adult-learners, the teachers. These dialogue-configurations were temporarily held together, with most pairs being in such face-to-face encounters (Goffman, 1964) and intimate one-on-one dialogue about home and family life for the first time, even if they knew each other prior to this event. Usually analysis of collaboration presupposes a history of collaboration (Enyedy & Stevens, 2014) while in this case, the pairs were very much in the process of getting to know one another intimately which is often the case in Tutoría and it is through the sharing of stories that allowed for shared and reciprocal meaning-making about family lives.

Table 5.6. Temas and Student-Teacher pairs

Tema	Student-Tutor, Grade, Tribe	Teacher-Learner, Grade taught, Tribe/Ethnic group	First meeting
Hmong cloth dyeing	Ti, Grade 10, Hmong	Kru Jan, Upper primary, Karen	Yes
Trap fishing	Arm, Grade 6, Akha	Kru Noom, Upper primary, Karen	No
Akha toys and games	San, Grade 6, Akha	Kru Orn, Lower secondary, Thai (Lanna)	Yes
Tea from coffee husks	Fa, Grade 10, Akha	Kru Rungroi, Upper secondary, Thai (Isarn)	No
Volleyball	Chompu, Grade 8, Karen	Kru Tep, Lower secondary, Lahu-Thai	No
Rice planting and harvesting	Mali, Grade 6, Thai (Lanna)	Kru Yai, Upper primary, Thai (Lanna)	No

Transcription & Translation Conventions.

All the video files – the dialogues, final presentations, and post-Tutoría interviews were transcribed in Thai in Thailand and then translated into English by myself and verified with Khun Sukanda and Khun Panthiwa who were present at the two day sessions. I borrow from transcription and translation conventions that include pauses and breaks within the paragraph of speech (Nikander, 2008; Ochs, 1979). In this paper, I keep the dialogues in both languages to one, ensure the teachers' voices carried as much of its meaning in its English translation as well as Thai, and two, to increase readability for our team in Thailand.

I use the following three conventions taken from Ochs (1979, p. 174 – 175) within a parallel transcription/ translation format (Nikander, 2008, citing Nikander, 2002).

No gap latching	= placed between utterances with no time gap among speakers
Pause length	(0.3) placed before utterance to indicate millisecond pause (.) indicates a very small pause
Self-interruption	- placed at point of interruption
Text removed	[...]

Video analysis

Dialogues. In the first round of video analysis, I re-watched and content logged the Tutoría dialogues in Inqscribe®. I wrote analytical memos for each pair to notice moments where social poetics seemed present and when they were not. These social poetic moments were then chunked into episodes – sequences that held thematic and interactional coherence that followed the pair's specific line of inquiry (Marin & Bang, 2018), in this case, usually beginning with a question posed by the young person or teacher (e.g. how do you usually dye cloth as an episode and explaining how the dyeing wheel works as another episode). These episodes were re-watched and coded in Nvivo, where I paid particular attention to the discourse tactics of how the pairs oriented to other another as an ecological site of interaction and construction through the framework of social poetics (Erickson, 2004; Goffman, 1983). I then generated themes around how moments of situated social poetics related to (1) young people's ethical and political orientations within their homeland practices, (2) subsequent expanded possibilities for learning at school and home, and (3) how these were seeded and taken up or not, by their teachers and the group.

Final presentations. After episodes were created, I content logged all 6 final presentations and 12 post-Tutoría interviews in Inqscribe ®. I paid attention to 1) what teachers self-reflective narratives about was important learning moments for them and 2) areas of interest that the teachers wanted to do more research on. These were then added to the analytical memos for each pair. I analyze how reflective sense-making triangulated, extended, and layered on meanings from the initial analysis of Tutoría dialogues. Using the framework of social poetics, I looked at how new forms and felt dynamics were related to emergent stances and emplaced possibilities that seemed important to the six young people and six teachers.

5.4 FINDINGS/LEARNINGS

My analysis looks at the interplay between the poetic and its emplaced possibilities through designing with homelands in Tutoría. I organize the findings around three different kinds of emplaced possibilities emerged through the various teacher-student pairs. The three *poetic-possibilities* I focus on in this paper are: (1) Making as alternative to production and consumption, (2) Relational considerations with tools and technologies, and (3) Reciprocal interdisciplinary navigations across home and school. With social poetics, I organize this analysis around the three central Temas that students designed, each corresponding to a specific (re)storying of land-based practices and emplaced possibility that emerged as students and teachers (Table 3).

I begin each finding giving an overview of the students and teachers. I then present a series of (3-4) episodes for each pair, with attention to talk and social theory (Erickson, 2004). Specially, I examine how cycles of new forms, felt dynamics, emplaced possibilities were expanded and constrained for teachers and young people. Finally, I conclude each analysis of *poetic-possibility* with some ways that these could continue to participate in colonial enclosure for Indigenous young people and communities.

The first emplaced possibility is to see land-based making as alternatives capitalistic production and consumption. I describe how in the Tema of Hmong cloth dyeing, new utterance forms and felt dynamics during Ti and Jan's face-to-face encounter expanded the possibilities of re-mediating singular narratives of development and modernity common in Eurocentric schooling. I supplement this emplaced possibility with making with another teacher's reflection who worked on Akha

Games and Toys. The second poetic-possibility that surfaced at Sahasat was relational and ethical considerations with tools and technologies. From the Tutoría dialogue around trap fishing, I examine new epistemological forms and how toggling across human and more-than-human perspectives was a kind of felt dynamic that Kru Noom experienced in the Tema. I then discuss some challenges that continue to reinforce powered dynamics when teachers find it hard to be vulnerable within Tutoría dialogues. Finally, the last poetic-possibility is reciprocal and interdisciplinary navigations across home and school. Using rice harvesting and a new experimentation with coffee husk tea, I examine homeland practices as interdisciplinary forms of learning that expanded possibilities for disciplinary (Thai and Biology) understandings. I conclude by showing how these innovations that are supported by schools could reinforce capitalistic agendas if the ends of production are unclear.

Table 5.7. Overview of learnings

Tema	New forms	Felt dynamics	Emplaced possibilities
1. Hmong cloth dyeing 2. Akha Games	Utterance	Curiosity & Listening through questions Extending ideas	Making as Alternatives to Production & Consumption <i>Challenges: Fossilizing the past</i>
3. Trap fishing	Epistemology	Listening through Struggle and Perspective taking	Relational and ethical considerations with tools and technologies <i>Challenges: Aboutness thinking that reinforces dominant relations of power</i>
4. Rice harvesting 5. Coffee husk tea	Disciplines	Listening through Affect for land-based practices	Disciplinary navigations across school and home <i>Challenges: Reinforcing state & capitalist agendas</i>

5.5 POETIC & POSSIBILITIES ONE: DESIGNING WITH HOMELANDS SURFACED LAND-BASED MAKING PRACTICES AS ALTERNATIVE TO CAPITALISTIC PRODUCTION & CONSUMPTION

Within this poetic & possibility, I analyze the episodes of Tema 1 on Hmong cloth dyeing with Ti and Kru Jan. I provide a summary of the case and then supplement it with a final presentation from San & Kru Orn in Tema 2: Akha Toys and Games to show teachers' as a collective were beginning to see land-based practices as alternatives to production and consumption narratives in school.

Tema 1: Hmong cloth dyeing, Ti (student) and Kru Jan (teacher)

Ti was considered a student “average in everything” according to his teachers who had nominated him to be one of the students we include in our case studies. At the time, Ti was 15 years old and in Grade 10 at Sahasat. He lives and works part-time in Chiang Rai city, and goes home twice a year to Huay Mae Pao (หมู่บ้านห้วยแม่เปา), a Hmong village west of Chiang Rai province, almost bordering eastern Laos. In the post-teaching interview, Ti shares the history of his father, of his clan, explaining that they had come from a desert and started the village with nothing to use to dye cloth. So someone had proposed making this wheel and that the wheel was very useful for the village community because it was such a unique method, dyeing cloth like this. He also shared the creating this Tema was important because he feels that teachers in the new era look down on the teachers of the past because could not read or write Thai when the teachers of the past actually have deep knowledge from experiences. He says, “That teachers look down on the past, and speaking like this makes... the teachers of the past are not inferior to writing books. **ที่ครูดูถูกสมัยก่อน แล้วมาพูดแบบนี้ทำให้แบบ ครูสมัยก่อนไม่ได้ด้อยอะไรมากไปกว่าการเขียนหนังสือ**”. The Hmong dyeing wheel thus represented history and ancestors, their unique knowledges and continued meaning for his village and clan.

Kru Jan is Karen and one of three tribal teachers in the Tutoría team at Sahasat. She was a former student at Sahasat and became an English teacher to help tribal young people overcome “the lack of opportunities” in their communities, mirroring her own life. This comes from a felt affect experience of colonization (Million, 2008) where deficit views of tribal communities run deep. In an interview with her in December 2016, she insisted, “in general speech, we’re hill people but hill people are still *people* “**ภาษาทั่วไป ก็คือ คนดอย ก็คือ คนดอยก็คือคนนะ.**” We are not rich but our parents want us to not have such tough lives. In her December 2016 interview, Kru Jan’s solution to this is for young people to studying diligently “**อยากให้นักเรียนตั้งใจเรียน**”.

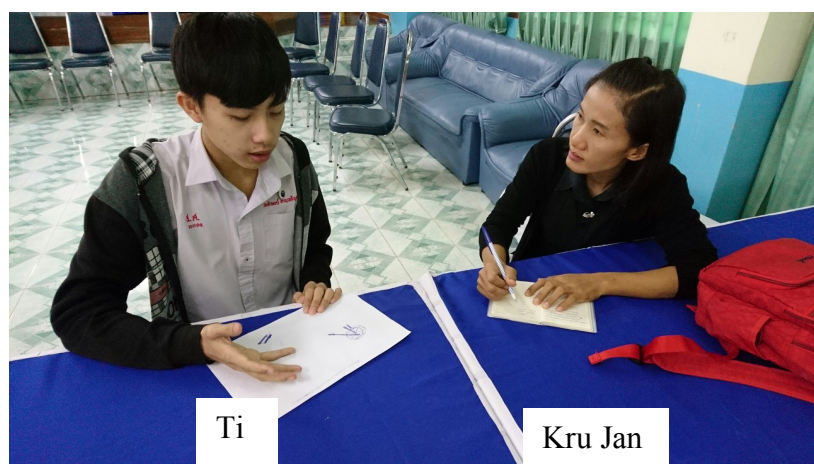
Kru Jan chose this Tema out of the various one that were presented by the students. This Tutoría sessions was the first time Ti and Kru were meeting and being in an intimate face-to-face encounter with each other (Goffman, 1964). Ti’s designed his Tema around Hmong cloth dyeing, and worked with his mother to understand the cultural contexts, mechanics, practices around it. The Tema used

the machine (drawn on paper) as a central artifact and substrate on which the pair built on other questions and ideas. The wheel is a wooden bamboo machine that has eight sides and operates by a hand crank. Ti was interested in this topic because it is an artifact in the community museum in his village, and that he has not seen it being used consistently by his family or others in the village. In his Tema, he also discusses the role of technologies today and comparing them to those in the past, and the applicability of the knowledges learned in school. Below is the final poster presentation by Kru Jan on Hmong cloth dyeing. (See Image 1 below).

Image 1. Kru Jan's final poster and drawing of the cloth dyeing wheel

<ul style="list-style-type: none"> • Hmong/Wisdom • Status before: Poverty 		<ul style="list-style-type: none"> • Dye • 8-sided wooden tank/ pan • Hot water/loosen/ color absorbing • Gravitation • Natural resources • Dye color • Physical exercise • At present: In museums/ rubber tube roller
<ul style="list-style-type: none"> • Tutor: Ti • Tutee: Kru Jan 		

Image 2. Ti and Kru Jan



Ti

Kru Jan

In the episode that follows, Ti questions notions of development and technology with his Tema around Hmong cloth dyeing. His opening question that Kru Jan talks about as most impactful in her final presentation is “ยังอุปกรณ์แบบปัจจุบันแบบนี้ เราต้องทำอะไรบ้าง ครูพอจะรู้ไหมครับ แบบย้อมสีผ้า What equipment do we have today that you know of that can be used to dye clothes? Up until this episode, the pair have been talking about how the wheel works, experiences with dyeing cloth from each of their home lives, and expanding notions of theory and knowledge. Their conversation is as follows.

Episode 1-1: The Creativity of Those before us

Kru Jan 11:08	<ol style="list-style-type: none"> 1. มีสีม่วงสีเขียวสีดำส่วนใหญ่ก็ 2. คนกันเองนะก็ใช้พันธุ์ไม้ 3. แต่ถ้าทำอย่างนี้ก็เป็นใจมันช้าไหม 4. เตี้ยนั่นนะไปซื้อ 5. ก็แป็บเดียว 	<p>There's mostly purple, green, black that the people use from trees</p> <p>but if they do it this way it is very slow?</p> <p>Nowadays, one can go out and buy it and it only takes a second.</p>
Ti 11:24	<ol style="list-style-type: none"> 6. แต่คือก็ได้ออกกำลังกายด้วยนะครับ 7. มันก็ไม่ต้องเครียดอะไรเยอะด้วย 8. แล้วมันก็ทำง่าย จากวัสดุที่ 9. มันไม่แพงด้วย 	<p>But it's they can also use physical energy too.</p> <p>They don't need to be too stressed either.</p> <p>It's also easy to make from the materials that are not expensive either.</p>
Kru Jan 11:35	<ol style="list-style-type: none"> 10. เขาเรียกว่ามันเป็นความคิด 11. สร้างสรรค์ของคนสมัยก่อน 	<p>They call that the creativity of those of before us.</p>

Social poetics as listening through questions of settled knowledges

New forms: Kru Jan listens through questions. She questions the purpose of harvesting dyes from the natural world and dyeing cloth manually. In the flow of their conversation, she introduces a new pedagogical form, a question that pushes at the basic assumptions of the cloth dyeing practice. She asks (Line 3) “but this way is very slow? Nowadays, one can go out and buy it (dyed cloth) and it only takes a moment.” She implies that harvesting and hand-spinning cloth is slow as compared to the time-efficiency advantage of store-bought and commercially dyed cloth. Such narratives might be based on commodified relations to materials and making commonplace to discourses on development and modernity in Thai schools (Kwanchewan & Prasit, 2009).

Ti then introduces a new form of axiological consideration for cloth dyeing and making. He offers four other values of dyeing cloth by hand (Line 6-9) – the physical work and embodied nature of spinning the wheel, the mental health or “not being too stressed”, the ease and the low costs of working with what is available to us in the natural world (Line 8). He introduces other “ends” for the process of making and cloth dyeing that are alternatives to simply production-driven values.

Felt dynamics: Kru Jan’s openness to being moved by what Ti was saying allowed for new emergent understandings of the multiple goals and axiologies for cloth dyeing. Her question was not an attempt to find one right answer but instead I suggest that it is an example of what Shotter describes as to come to “sense the inner nature of the other or otherness before them” so that difference can emerge through such intertwining (Shotter, 2010, p. iv). She follows up on Ti’s answer saying that “They call that the creativity (ความคิดสร้างสรรค์) of those before us” (Line 10-11). Her sentence is a kind of expressive felt dynamics in response to Ti.

Emplaced possibilities for Kru Jan: Kru Joy’s listening through questions help both Ti and Kru Jan experience emplaced possibilities to navigate the heterogeneous goals and axiologies around the production of dyed cloth. Narratives of capitalistic production are often entangled within the sociopolitical and axiological landscape of school (Bang, Warren, Rosebery, & Medin, 2013; King, 2013 as cited in Barajas-López & Bang, 2018). Harvesting dyes from the natural world and embodied making and materiality offers a diverse set of possibilities for understanding the uses, purposes, and experiences of cloth dyeing. The dialogue between Ti and Kru Jan opened up for both of them different relationships to the object of joint attention – cloth dyeing.

Episode 1-1 (continued)

Ti 11:39	12. หาได้จากธรรมชาติด้วย 13. อันนี้คือคนสมัยก่อน 14. เขายังไม่รู้จัก 15. คณิตศาสตร์แรงโน้มถ่วง 16. อันนี้เขายังไม่รู้ 17. แต่เขาก็สร้างมาได้โดย 18. เขามีความรู้เขาแค่ไม่รู้ 19. ความรู้นั้นคืออะไร 20. แต่ที่จริงแล้วเขามีความรู้ 21. อยู่ในตัวเองอยู่แล้ว ก็เลยเอามา 22. ดัดใช้เป็นแบบนี้ครับ 23. แบบนี้อาจจะดัดแปลงเป็น 24. หลายแบบก็ได้ 25. ไม่จำเป็นต้องปั่นผ้าก็ได้ครับ 26. บางครั้งเขาก็เอาไปทำอย่างอื่นบ้าง	You can find it in the natural world too. This is of the past, where they still haven't learned it from mathematics or gravity – they didn't know this yet but they also could create this by their own knowledges only they didn't know what knowledge that was. But actually their knowledge is in their own selves already (.) and they use it and adapt it and use it in this way. Like this, they can also maybe adapt it in many ways, it doesn't just have to be about spinning cloth. Sometimes they use it to make other things.
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Emplaced possibilities for Ti: My ancestors knew physics and mathematics

Kru Jan's questions settled knowledge prompted further interrogation of knowledge for Ti. In his response to Kru Jan's idea of creativity, he broadens his interrogation to the applications and purposes of abstracted disciplinary learning at school. While Ti says “they didn't know what that knowledge was” (Line 18-19), it seems like he meant that they might not have known the words for it but knew it in their own way. He uses ‘mathematics’ and ‘gravity’ as disciplinary terms to signal terms that first, his people did not need to first learn about these concepts to use them in making or know them in their own way, and vice versa, that knowing disciplinary words did not mean one knows how to apply it. They knew it an embodied way – that the knowledge was “in their own selves” (Line 21). The knowledge in their own selves was adaptive; they were able to use it in creations and adapt it in heterogeneous ways from theories lived understandings of the natural world rather than from within school life. Their experiences with land allowed for theories of physics and mathematics that were adaptable, contextual, varied, and extensive.

Here, Ti says they “did not learn it through mathematics or gravity” and could “create this by their own knowledges only they didn't know what that knowledge was.” Through teaching this Tema, he relationship to understanding Hmong knowledges was also transformed. In an interview at the end of this session, when asked why he wanted to teach this Tema, Ti reframed his

understanding to say “My ancestors knew physics and mathematics, they may not have written it down, but they knew it.” Through social poetics of questioning settled knowledges with openness, the reverberations and resonances of such poetic engagements “to become a new being in our language” and a change in our being (Shotter, 2010, p. 45); new forms grow other new forms.

Episode 1-2: Why don't you submerge it?

Another notable social poetic moment is when Kru Jan again questions the basic assumptions about the Hmong method of cloth dyeing using a wheel. After Ti explains in detail the working of the wheel, she asks: **อย่างเมื่อกี้ที่ครูเคยบอกแบบนี้เป็นถังแล้วเขาก็จุ่มลงไปย้อมแต่ทำไมเขาใช้วิธีแบบหมุน ทำไมไม่จุ่มลงไปเลยแล้วพอจะรู้ไหม** “Just now you said that it was a bucket and then dye was dipped into it but why did they use a rotary method? Why don't you just soak it, do you know why?” (Line 10). This question about submerging cloth in water, almost makes the lack of necessity to create such an intricate system and wheel. Kru Jan asks this from her own experiences dyeing cloth that way.

<i>Speaker/ Time</i>		<i>Dialogue</i>
Ti 16:24	<ol style="list-style-type: none"> 1. ใช่ครับ ถ้าเกิดจากอย่างนี้ใช่ไหมครับ 2. มันต้องมีแรงโน้มถ่วงดึงลง เพราะมัน 3. ดึงลงไปมันจะมีแรงเหวี่ยงซึ่งเหวี่ยง 4. มาแบบนี้เหวี่ยง (.) ขึ้นไป 5. แล้วจะดึงมาใหม่อีกครั้งหนึ่งลงได้เรื่อยๆ 6. แต่ว่าแรงที่ดึงดูด มันอาจจะเยอะกว่า 7. มันต้องหยุดสักครั้งหนึ่ง ต้องมีสักครั้งหนึ่ง 8. ที่มันต้องหยุด เราก็ต้องหมุนๆ 9. พอมันหยุดแล้วเราก็หมุน 10. หมุนๆตลอด (.) อย่างนี้ก็เหมือนกันมันจะ 11. ช่วยมีแรงเหวี่ยง ตรงนี้นะครับ 12. ตรงที่เราหมุนมันจะช่วยทำให้เราผ่อน 13. แรงเรานะครับ(.) 	<p>Yes, if it's like this right (.)</p> <p>There is a gravity which pulls it down. When it is pulled, there is some centrifugal force whose movement is like this (.) upwards and then it is pulled down again and again.</p> <p>But the attracting force might be more.</p> <p>It has to stop once, has to be just that one stop so you have to keep rotating it.</p> <p>When it stops, we have to keep rotating it all the time (.) It's like there is some centrifugal force there.</p> <p>When we rotate it, it helps us to save our energy (.)</p>
Kru Jan 17:08	<ol style="list-style-type: none"> 14. อย่างเมื่อกี้ที่ครูเคยบอกแบบนี้เป็นถัง 15. แล้วเขาก็จุ่มลงไปย้อม (.) 16. แต่ทำไมเขาใช้วิธีแบบหมุน 17. ทำไมไม่จุ่มลงไปเลยแล้ว 18. พอจะรู้ไหม 	<p>Just now I had said that this was a bucket and then dye was dipped into it (.)</p> <p>but why did they use a rotary method?</p> <p>Why don't you just soak it, do you know why?</p>

Ti 17:21	<p>19. เวลาเราจุ่มลงไปใต้น้ำใช้ไหมครับของครู</p> <p>20. จะเป็นคล้ายๆแบบตะกร้าใช้ไหม</p> <p>21. แล้วก็ผ้าแล้วก็จุ่มลงไปใต้น้ำเพื่อเหมือน</p> <p>22. ให้มันแช่ ใช้ไหมอะ</p> <p>23. ถ้าเกิดว่าถ้าเวลามันไม่ขยับใช้ไหมมันจะ</p> <p>24. ยึดติดกันแน่น</p> <p>25. เวลาถ้าเกิดว่ามันถูกหมุนไปเรื่อยๆ</p> <p>26. โดนความร้อนไปมันจะช่วยควายคลาย</p> <p>27. ตัวเรื่อยๆ คลายตัวเรื่อยๆครับ</p>	<p>When we submerge it in the water, right?</p> <p>It's similar to the basket, right?</p> <p>There are some clothes dipped in the water so that they are soaked, right?</p> <p>But if it isn't rotated right, it (the cloth) sticks together very tightly. When they (the cloth) are moved around, will come into contact with the heat, they will loosen and become looser and looser.</p>
Kru Jan 18:43	<p>28. เออเราก็ว่าปกติเราเคยเห็นเขาก็จุ่มลงไป</p> <p>29. เลายนะ แต่อันนี้มันก็ทำให้ไม่เป็นก้อน</p> <p>30. สีมันก็จะกระจายซึ่มง่ายๆ</p>	<p>Ohhh right, usually we have seen it go down in here but this here makes it not lump up so that that color is distributed easily.</p>

Similarly as in Episode 1, Kru Jan is trying to reconcile settled knowledges and the kind of Hmong knowledge system that Hmong cloth dyeing is embedded within. Ti's detailed description of centrifugal forces (Lines 1-13) seem to move Kru Jan to ask a question. Something does not sit right with her and she begins by saying "Just now I had said that this was a bucket and then dye was dipped into it" (Line 14-15). Her prior sharing of dyeing techniques involves soaking the cloth in water and she does not understand "why did they use a rotary method? Why don't you just soak it, do you know why?" (Line 16-18). These questions reflect a kind of openness for "engagement within a multiplicity" (Massey, 2005, p. 62). Ti takes her question seriously as well and offers an attention to the quality of the dyeing process which the machine affords that Kru Jan had not considered. The loosening of cloth threads with the continual momentum and heat ensures each strand is dyed with the same consistency and quality (Line 23-27). Kru Jan's relationships with cloth dyeing is expanded again as she echoes "Ohhh right... so that is color is distributed easily" (Line 30). The use of the expressive "Ohhh" seems like a temporary stabilization of a new emplaced form of understanding the multiplicities of cloth dyeing techniques and considerations.

The expansion of possibilities occurs within the context of Kru Jan's emplaced understandings, her own tribe's methods for cloth dyeing and also the ones of Ti's village. Unfolding in interaction, Kru Jan's relation to cloth dyeing is expanded as there are now heterogeneous ways, relations and axiologies for dying of cloth. This is extended in this final episode below.

Episode 1-3: But really using energy can help a lot of things

<i>Speaker/ Time</i>	<i>Thai</i> ไทย	<i>English</i>
Kru Jan 21:30	1. ไซ้ แต่พูดถึงถ้าเย็บเครื่องนะ 2. จากที่ได้เห็นนะหรือว่าเย็บมือนะ 3. เย็บมือจะอยู่นาน	Yeah. But speaking of if sewing machines, from what we can see is sewing by hand, sewing by hand lasts longer.
Ti 21:40	4. จะดูดีกว่าไซ้ไหมครับ 5. ก็เหมือนกันแหละครับ	It'll look better right? So it's the same.
Kru Jan 21:46	6. เย็บเครื่องนี้มันไม่แน่นมัน 7. เหมือนว่ามันจะหลุด 8. แต่ถ้าเย็บมือแน่นแล้ว 9. ก็สวยกว่า	Sewing using machines isn't as tight as and it looks like the threads will fall but sewing by hand is tighter and it's more beautiful.
Ti 21:57	10. มันก็คล้ายๆกับอันนี้แหละครั 11. มันพัฒนามาก็จริงมันสะดวกก็ 12. จริงสบายก็จริงแต่ว่ามันอาจจะ 13. ไซ้ได้นานไม่เท่าเดิม 14. แต่มันจะช่วยให้ความสบาย 15. ไม่เปลืองแรงแต่ที่จริงไอ้ที่เปลือง 16. แรงเนี่ยมันช่วยได้หลายๆด้าน	That's similar to this. It's true that there's development, that is more convenient, but maybe if we use it for long enough it isn't as good as before. But that helps it be more comfortable so we don't use our energy but really using energy can help a lot of things.

Towards the end of the dialogue, Kru Jan begins to compare a practice that she is familiar with – sewing. She compares the quality of work produced by a sewing machine as compared to work done by hand saying that sewing by hand “lasts longer” (Line 2-3). Ti affirms this parallel example, saying “it’ll look better right? It’s the same” (Line 4-5) and “that’s similar to this” (Line 10). Sewing by hand is “tighter” and “more beautiful” in its aesthetic as Kru Jan mentions, reflecting the intimacy and delicateness by which each strip of cloth is dyed.

Using these two sociocultural practices of sewing and dyeing cloth and how they compare in term of both the beauty, longevity, and quality of work that they produce, Ti extends his theory what the physicality of doing such work produces in us. He navigates through heterogeneous axiologies of development and suggests that first, “it’s true that there’s development” and “convenience” at the cost of something being used for a shorter time as “it isn’t as good as before,” (Line 11-13) and second, that development might help “be more comfortable so we don’t use our energy” and yet “but really using energy can help a lot of things” (Line 14-16). He suggests that

there are reciprocal relationships when we put our bodies to work; not only is the quality of the work created when we make them, but the act of creation “can help a lot of things” for us too. Making ensures story; it ensures relationship and meaning while commodification removes relationship. The juxtaposition of heterogeneous values, aims, and benefits of technologies and developments is an opening for new emplaced possibilities for both Kru Jan and Ti. This pattern of juxtaposing e.g. “it helps this” but “really” is a way that Ti problematizes global and national narratives of modernity and convenience toward alternative goals like physicality, aesthetic, and longevity, a kind of delinking (Mignolo, 2007) through *making*.

In this example, Hmong cloth dyeing contains the epistemologies, ontologies, and axiologies of making and materials of his family and his ancestors. On one level, the combination of living with social poetics *and* designing with homelands – the embodied practices of making and materiality with lands from within Indigenous axiologies – were openings for emplaced possibilities for Ti and Kru Jan and their relationships to their own homeland practices. On another level, endogenous theory-making here challenges powered relations of who holds knowledge and singular settled definitions of development common in global discourses around schooling. It subtly questioned otherwise settled narratives, goals, and ends of schooling for capitalistic production and consumption. Ti and Kru Jan, by listening through questions and the intertwining of stories of homelands, show us that theory making is in everyone's domain and opens up navigational possibilities across heterogeneous knowledge systems and land-based axiologies.

Challenges: Movements, complexities of colonial enclosure with fossilizing the past

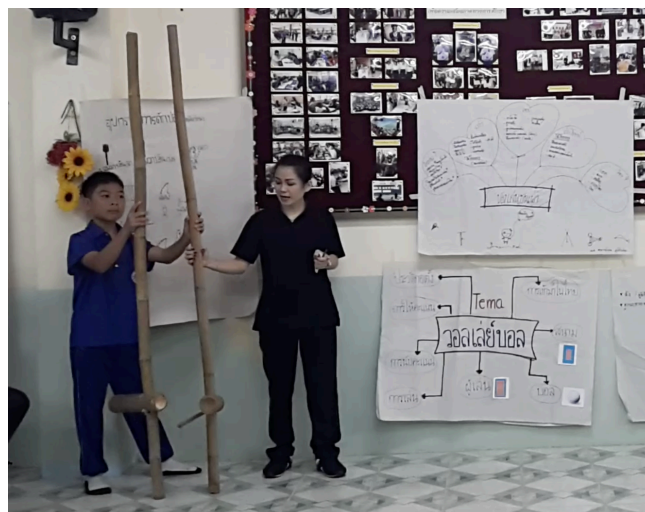
In Kru Jan's final presentation, she says that she has learned that this cloth dyeing machine has not been practiced in Ti's home village recently and that the machine is located in their community museum. She repeats that maybe their village could add placards in the community museum with writings to teach the future generations about this practice. On one hand, her statements hint at a kind of fossilization colonial enclosure where the intelligences of Indigenous people are no longer or a thing of the past. Ti's Tema opened up possibilities of knowing, but yet these practices are relegated to the past instead of dynamic and living. On the other hand, we can also read Kru Jan as urging Ti to intervene in a museum space, another deeply colonized space and be a knowledge producer for his community. Ti is asked to ensure the continuity of Hmong wisdoms into the future,

and to work locally to keep it alive in his village. Schools spaces thus could have the potential to impact the way museums and their artifacts are designed, used and carried forward. Thus, as educators who are working from with and through Indigenous knowledge systems, we must continue to be aware of how the ways in which we sustain, re-member, and build new Indigenous knowledges and technologies can also participate in colonial enclosure.

Tema 2: Akha Games and Toys with San & Kru Orn

In another final presentation that included the embodied practice of making Akha bamboo stilts. San who made the stilts, designed his Tema on Akha (his tribe) toys and games. He worked with Kru Orn and their dialogue was focused on sharing stories about what kinds of games they played, when and why they played them, their histories, materialities, purposes, practices, ceremonies, the changing forms and functions of different kinds of games, as well as making one of them – bamboo stilts, a traditional Akha game that San and his parents play. In the final presentation, San shares about his felt responsibility to ensure he remembers how to play the games his parents played. Kru Torn in her demonstration said, “We should probably still play a lot of this in our school, so that the kids in the future, will keep their own culture of games and toys of the tribes.” In front of all the teachers, San responded that this Tema was important “Because my parents played it a lot” and that “Nowadays we don't play this so much anymore so I wanted to keep the practice.” (See Image 3 below).

Image 3. San (left) holding stilts he made as part of his Tema and Kru Torn (right) presenting on tribal games



Kru Orn then said the Tema was important because through the making of the toys, there is more meaning to simple consumption of bought objects. She reflects:

“Only then we know to make it ourselves. And then we play it ourselves. It's like there's another kind of feeling. It's not the same as buying something or getting something for free, and then we play and then it's over. And then we feel like it's a pity. But this, even when it's over, you feel something, that it's something you made yourself. So I'll go home and get my kids to make it (toys).”

Her final reflection is evidence of emplaced possibilities when we understand the games and toys from within larger material, cultural, and temporal ecosystems. This manifests in needing to have increased emphasis on materiality and making at Sahasat, and even teaching her own children to be apprenticed into these practices.

Summary: Relational Making as Alternative to Production and Consumption at Sahasat

From Hmong dyeing to Akha toy making, teachers reflected on how making and materiality could be important alternatives to global and state-driven agendas that promote the commodification, economic production, and consumption purposes of school. These two final presentations by Kru Jan (Hmong cloth dyeing) and Kru Torn (Tribal games and toys) helped the teachers reimagine schools as a potential space for Indigenous making and sharing.

There seems to be evidence to suggest that are evidence of the emerging sensibilities and renewed responsibilities for the school to sustain embodied Indigenous making practices. At another level, the introduction new form of design – designing with homelands was also a kind of *poiesis* – the unfolding of co-creations at Sahasat. This first session introduced new forms that led to continued engagement with making and knowledge from home. Since these Tutoría sessions, Sahasat began to train their new teachers in Tutoría through having them design Temas from their homelands – such as creating bird traps, plant grafting, shrimp catching, among others. The Tutotía team and school leadership at Sahasat has also organized four different Tutoría fiestas that are centered on Indigenous making from within various tribal traditions.

5.6 POETIC & POSSIBILITIES TWO: DESIGNING WITH HOMELANDS SUPPORTS RELATIONAL AND ETHICAL CONSIDERATIONS AROUND TOOLS AND TECHNOLOGY

I present episodes from two pairs – Arm and Kru Noom, and San and Kru Orn to illustrate how designing with homelands illuminated the relational and ethical considerations around fishing and playing games respectively. I use these two cases to show (1) how young people made visible their ethical sensibilities that ground these practices and (2) how teachers’ listening through felt struggles around the ethics of tools and technology can renew emplaced possibilities towards development narratives in school that continue to protect the natural world.

Tema 3: Trap Fishing with Arm and Kru Noom

Kru Jan recommended Arm to be one of the student cases studies because he is generally seen as quiet child who does not engage much, and “never smiled³³.” In a class of 50 (average class sizes at Sahasat), he is a child who teachers might never notice. Arm, 12 years old in 2017, stays with over 60 other young people in a group home for Akha people, many who also go to school at Sahasat. He goes back to his village in Huey Sak province (45 minutes from the city) twice a year during school breaks. Arm’s father is northern Thai and his mother is Akha. They live in a small compound with three houses, adjacent to his grandparents, aunts and uncles, and a tall palm tree from which they weave hats to sell. Arm has been trap fishing with his father since he was a child, laying traps in rivers and small creeks around his village. He designed his homeland practice Tema around trap fishing, the topic of focus and substrate for their dialogue (Goodwin, 2013; 2017).

Kru Noom was Arm’s English teacher two years ago, when Arm was in Grade 4. Kru Noom is Karen and 2017 was his 5th year teaching at Sahasat. I knew Kru Noom when he first began teaching English and had a Christmas coconut ice-cream party with his class in 2012. Kru Noom wanted to be a teacher in Sahasat so that young people “they can go back to their communities to and continue developing their communities forward.” Kru Noom lives in Chiang Rai city and goes to visit his family his village every weekend. I have been back to his village with him and his sister, to harvest vegetables on the mountain side, see a bamboo pipe irrigation system in progress and go on motorbike rides to the rice fields.

³³ Kru Noom had described Arm like this.

Arm's Tema examines the lives of fish and the kinds of trap fishing techniques, new epistemologies (forms of knowing) with the lives of fish, and the ethics surrounding fishing tools and technologies of the past and of today. Their dialogue seems to unfold in a living way with sharing stories, perspective taking with fish, and uncovering assumptions and ethical decision making around fishing. To conclude, Arm and Nu then make two fishing spears from bamboo as examples of “tools of the past” or “original technologies” (Bang, Marin, Faber, & Suzokovich, 2013) as part of their Tema (Image 5).

Image 5. Kru Noom and Arm at the final presentation with the bamboo spears and poster



Arm begins the Tutoría dialogue, asking “In the past there wasn't the technologies that we have today to fish. In terms of fishing methods – which ones do you know?” They share stories and methods of trapping fish: with whom, where, and how Kru Noom has trapped fish as a child. Here is an episode that first brings into question the kinds of tools and technologies in fishing and issues of ethics with technologies of various times as new forms to think with throughout their dialogue.

Episode 3-1: It was more fun and it's a way to help protect fish

<i>Speaker/ Time</i>		<i>Dialogue</i>
Arm 3:45	<ol style="list-style-type: none"> 1. ถ้าให้ครูเลือกระหว่างการจับปลา 2. ในสมัยนี้กับสมัยก่อนแล้ว 3. ครูคิดว่าวิธีการจับปลาแบบไหน 4. สนุกกว่ากัน สมัยนี้หรือสมัยก่อน 	<p>If you had to choose between fishing now and in the olden days</p> <p>what kind of fishing method do you think is more fun, nowadays or the past era?</p>
Kru Noom 3:50	<ol style="list-style-type: none"> 5. สมัยก่อนก็สนุกอีกแบบดิเนะ 6. แต่สมัยนี้ก็เป็นบอกว่า 7. เทคโนโลยีอะไรเยอะ แต่ว่า 8. คิดว่าสมัยก่อนสนุกกว่า 9. แล้วก็น่าจะเป็นวิธีแบบว่าช่วย 10. อนุรักษ์ปลาด้วย (.) แต่ในสมัยนี้ ถ้า 11. เทียบกัน ดูเหมือนได้จำนวน 12. ปลาเยอะก็จริง แต่ก็อันตรายกับปลา 13. อย่างเช่น ถ้าเราจับปลาที่เรา 14. ไม่กินอย่างนี้ (.) 	<p>I think, the past era was also fun in a good way but today's era is said to have lots of technologies.</p> <p>But the era before, I think was more fun and it probably it's said that it's a way to help protect the fish too (.) But in today's era, if we compare it, it actually seems like there's a lot of fish but it's dangerous for the fish, for example, if we go catch fish that we don't eat (.)</p>

New forms of knowing – epistemology and ethics: Arm here asks about the various methods that Kru Noom would use to fish now if he chose between methods of the past era and today. Even though today's era has “a lot of technologies,” (Line 7) Kru Noom chooses to keep to original ways of fishing because these ways are they are “fun in a good way” and “help protect fish” (Line 5 & 10). Fishing and protecting the fish were part of the same practice with methods of before and this was part of why it was “fun”. He contrasts it to today when it's “dangerous for the fish” (Line 12) when people catch fish but “that we don't eat” (Line 13-14). Kru Noom notes differences in the ethics, practices, and purposes of fishing that he feels has been changing across eras. He suggests that newer technologies might not hold the same ethics as tools and methods of the past. Kru Noom builds upon Arm's question around technologies to think about practices and their role in the ecosystem, and considerations around their ethics of use. Arm builds on these ethical considerations as their dialogue continues.

Following this conversation, Arm expands on the idea of the role of fishing in the ecosystem. He asks about the reciprocal nature of fishing and its techniques, asking “Does the practice of fishing, make us, human people physically stronger? แลวการดักปลา ครูคิดว่าน่าจะทำให้กำลังกายของเรา

แข็งแรงไหม” Kru Noom offers that it helps our bodies in a variety of ways for our body and our brain, saying:

“to walk into the forest, it also means I have to make the equipment, that’s a way to use physical energy in my body too Like this, there’s also using the energy of our brains, to think of the method of trap fishing. Like this and to cut bamboo, we have to use bamboo right?...It makes us more active/agile fishing like this.

อย่างเช่นเราต้องเดินไปไร่ไหมเดินไปแล้วก็แบบว่า คุณครูก็ต้องทำอุปกรณ์อย่างนี้ ก็เป็น ? การออกกำลังกายไปในตัวด้วย อย่างนี้ ก็เป็นการออกกำลังกายสมองด้วย คิดแบบวิธีการ ไร่ไหมไร่ไร่ตัดปลา อย่างนี้ และก็ ตัดไม้ไฟ ต้อไหม?...ที่คลองแคล้วขึ้นด้วยอย่างนี้”

Kru Noom’s description of how fishing helps us human people shows how land-based practices such as fishing teach us a kind of agility to think, create, and respond with land. He lists the skills it helps us with – creating tools from bamboo, walking in forests, and thinking of methods to trap fish by understanding river flows, cycles and seasons. “Fishing like this” in the past era not only protects the fish but helps to “make us more agile/active.”

Felt dynamics: Initial discussions around tools and techniques choice seemed to be openings for both Arm and Kru Noom to experience felt dynamics around ethical decision-making when fishing. We explore two other episodes when Arm introduces new forms of thinking through taking the perspectives of fish as a new kind of epistemological form with Kru Noom.

Episode 3-2: Pregnant fish

<i>Speaker/ Time</i>	<i>Dialogue</i>
Arm 10:20	So if you (teacher) are going out to trap fish like this, and a fish comes (is caught), and then you go back home and then you see that that fish is pregnant (.) what would you do?
Nu 10:23	Ohh, that fish is pregnant. In the past, when I was a kid, I liked it so much, when I saw the fish eggs like that. I would have just taken it to eat. (Laughs). You mean cooking, right? and those who are parents, they also (0.1) also (.) the parents made it for us to eat so I sat and ate it. So it’s like the stomach’s full of

- | | |
|--|---|
| 12. อย่างนี้ คือแบบว่า (.) ทำให้กิน | eggs right, so like (.) they made it for me to eat, |
| 13. พ่อแม่ทำให้กิน ก็คือ | dad and mom made it for me to eat and |
| 14. ก็ชอบกินนะ (0.2) | I liked to eat it yeah (0.2) |
| 15. แต่พอถ้าครูโตขึ้นใช่ไหม? | But now that I grew up right? |
| 16. ครูก็เข้าใจละว่า อ่ะ (.) ถ้าสมมุติว่า | I kinda understand that so (.) if for example |
| 17. เราจับปลาที่มันท้องมา ละก็ ปลาที่ | we catch fish that are pregnant and so, the fish also |
| 18. จะไม่มีโอกาสที่จะไปแพร่พันธุ์ใช่ไหม? | won't have the chance to breed right? |
| 19. ถ้าเป็น ณ ตอนนี้(.)ครูก็คิดว่า(.)น่าจะ | If it's now (.) I think that (.) I would |
| 20. เอาไปปล่อย ไปก่อน | take it to release it, to let it go first. |

Kru Noom repeats Arm's question, listens and then pauses as he thinks his response through. He tells a story of how he loved to eat fish eggs as a child, repeating how much likes to eat fish eggs. He attributes changing his mind now to growing up and understands that “fish won't have a chance to breed” if he continues to eat their eggs. He shares that now he understands the impacts of these decisions “now that I grew up right?” Now if he had caught the fish, he would “take it to release it, to let it go first” (Line 20). In the final presentation, Kru Noom also shares this moment with the rest of the teachers, and again how much he enjoyed eating fish eggs as a child. He summarizes that “I think we can still eat them, he (Arm) thinks so too but he proposed that we should not eat them so that they can continue to breed and should continue into the future ก็คิดว่ากินอยู่ เขาก็คิดว่ากินอยู่ แต่เขาก็เสนอว่าไม่ควรกินเพราะว่า เพื่อที่จะไม่ให้ เขาแพร่พันธุ์ เขาต้องขยายพันธุ์ต่อไป”.

Evidence of Kru Noom's listening is in his pauses and struggles with decision-making in trap fishing. It seems that he feels how these relationships with the lives of fish are “power-laden, preconstructed by history, and weighted by social gravity” (Erickson, 2006, p. 237). In the following episode, Arm asks about the fish's families who were waiting for them to return.

Episode 3-3: Fish Family

<i>Speaker/ Time</i>		<i>Dialogue</i>
Arm 14:01	1. แล้วสมมุติว่า ครูไปจับปลามาหนึ่งตัว 2. แล้วปลาตัวนั้น สมมุติว่า (0.1) 3. ครูคิดว่าปลาตัวนั้น 4. มีครอบครัวรอเขาอยู่	So suppose (.) if you went to catch one fish, and then the fish that one suppose if (0.1) teacher you think that the fish that one has a family waiting for him.
Noom 14:12	5. อ้อ =	Ohh (.)

Arm 14:13	6. = แล้วก็เขาก็อันนี้ คิดถึงครอบครัว 7. แล้วคุยกันอย่างไร ครูรู้ว่าเขามี 8. ครอบครัวรออยู่	Him, that one, thinking about his family, well talking like this, you know that he has a family waiting.
Noom 14:26	9. ถ้ารู้ใช่ไหม? (.) โดยปกติครูก็ไม่รู้นะ 10. ใช่ไหม ว่าปลาหมันมีครอบครัวหะ 11. (หัวเราะ) เพราะว่า เพราะว่าครูถ้าไป 12. จับปลาก็คือ ต้องทำให้ได้ (.) 13. ก็คือต้องให้ได้ปลามาให้ได้ 14. แต่ถ้า ก็คือว่าถ้าได้ตัวใหญ่ก็ยิ่งดี 15. อย่างนี้ ก็เคย (.) ละก็ (.) แต่ถ้ารู้ว่า 16. มีครอบครัวอย่างนี้หรือ? (0.3) 17. ครูก็คิดว่า ถ้ามีครอบครัวแต่เราก็ 18. อยากกินปลาอย่างนี้ (0.2) ก็ครูคิดว่า 19. ก็คือถ้าเราจับได้ใช่ไหม? ถ้ามี 20. ครอบครัวเขาอยู่ อืม (0.2) ครูก็จะ 21. เอาปลานั้นมากิน (หัวเราะ) เพราะว่า 22. ครูคิดว่า เอ๋ (0.1) แล้วก็อาหาร ก็ 23. ปลาเป็นอาหารให้กับคน เอ๋อ (0.2) 24. ก็ไปหา (0.2) 25. แต่ถ้าเขามีครอบครัว คิดจริง ๆ เราก็ 26. สงสารเขาเหมือนกันนะ (0.4) 27. แต่ก็ทำไม่ได้ ก็เลือกไม่ได้อะ 28. เพราะว่าเราต้องจับปลาเนอะ เราต้อง 29. มาเราต้องมาดำรงชีวิตของเราใช่ไหม?	If I know right? (.) Normally, I don't know, right, that the fish has their family. (Laughs). Because the reason to go catch fish, is to make sure I make a catch (.) So I have to make sure the fish comes to me but if – well the bigger the fish, the better, right. So (.) Yeah (.) But then but if I know there's a family? (0.3) I also think that if they have a family, but we also want to eat fish (0.2). So, I think, I think if we caught it already? If there is a family waiting too, um, (0.2) I think I will take the fish to eat. (Laughs) Because I think that uh (0.1) food, that fish is also food for people eh (0.2) so we to go find them (0.2) But if they have a family, I think, for real, we sympathize with them as well (0.4). But if we can't do it, we can't choose, because we have to catch fish yeah, we have to come to also keep living right?

Kru Noom's response is one of struggle as a form of listening. Part of ethics is feeling the social gravity of our decisions. We see here how Kru Noom puts a considerable amount of energy into coming to a final decision – a kind of felt dynamic that was made visible through Kru Noom's vacillations and pauses in his response (Line 16-26). Kru Noom feels and struggles through the social and ecological gravity in these decisions because these utterances are part of “ecologies in the wider world beyond the immediate space and time of a particular interactional encounter (Erickson, 2004, p. 175). The ecologies of the wider world in this case include considerations of multiple timescales and the health of multiple kinds – the futurity of the fish, their families, human life and our relationships to fish.

Kru Noom first acknowledges that he has not considered the fish's family when fishing before (Line 9-10). Throughout his speech, Kru Noom moves from saying “we want to eat fish”

(Line 18) to justifying this as the fish's roles and relations to humans where "fish is also food for people" (Line 23), and then to how humans seemingly "can't choose" and have to "keep living right?" (Line 29). Each time he moves through humans' relations to fish, he goes back to thinking about "if there's a family waiting" (Line 16, 19-20, 25). Even after making his decision that "I think I will take the fish to eat" (Line 20-21), he repeats the weight of realizing and considering that fish have family in Line 25-26 again, saying that we sympathize with them. He explains this decision about fish providing food for people in the first place is why we go look for them (Line 24). Our need for fish, however, comes at a cost. The reframe of needing fish to "keep living" (Line 19) seems to add to Kru Noom's sense of social and ecological gravity in taking the life of a fish and removing them from their family. Kru Noom's form of listening through struggle and perspective taking are made visible. His talk and pauses are imbued with the felt weight of history and future, a struggle within his utterances (Erickson, 2004). For him, the practice of fishing and eating fish is tied up with ethical and relational understandings of our decisions from within them.

Arm's use of the pregnant fish and fish family scenarios introduce a new epistemology- a new form of knowing with fishing and their lives of fish. Kru Noom's reception. Arm introduces these new forms of knowing with fish, complicating everyday ethical decision-making when humans go fishing. In both cases, Kru Noom seems to struggle with immediately deciding on what to do in those situations. He moves between various scenarios (e.g. liking to eat fish eggs and the needs of fish breeding for the future; humans needing fish as food and the needs of fish and their family) before offering an answer.

In Kru Noom's final presentation, he shared the variety of other questions that Arm asks him about the diverse kinds of fish and their characteristics. Some questions include:

- Which fish thinks they are the fastest? Catfish
- Do you think dolphins like to help people?
- What fish likes to hide at night?
- Which fish has the best hearing? They can hear us when we walk on the ground.
- How far can fish see?
- Why do snakes like to catch goldfish in corners?

Arm seemed interested in many different kinds of fish, how they perceive themselves, how they see, how they hear humans and how they relate to times and conditions. Tools and its ethics are

then placed within the contexts of 1) the diversity of unique fish kinds, 2) thinking about a fish's continuity into the future, and 3) the fish as part of social and familial lives.

Why are all the fish dead?

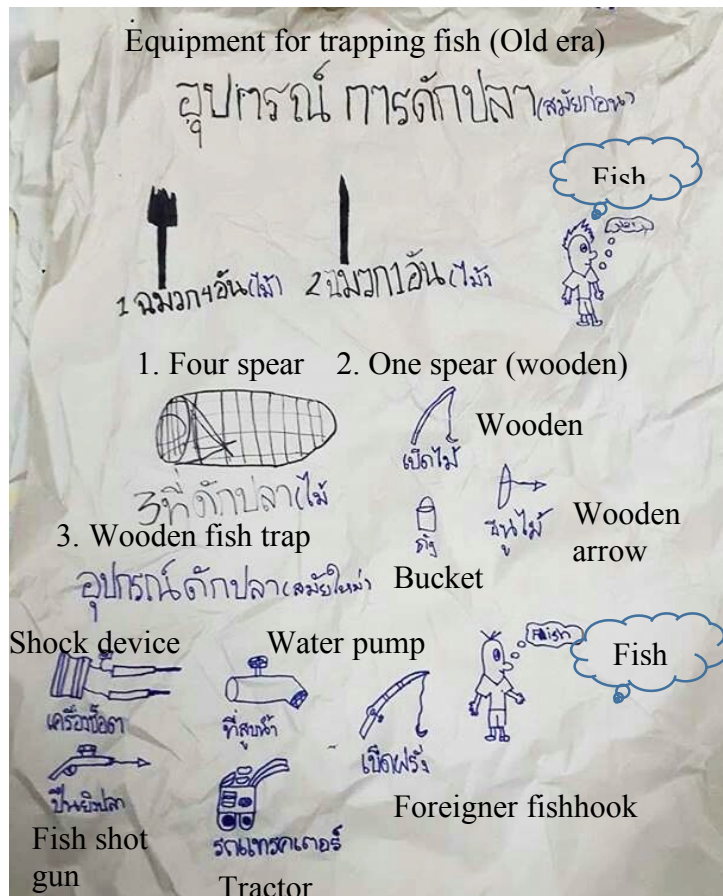
Arm in the earlier part of the dialogue asked Kru Noom “At present, why do the fish that we often eat, keep dying? ทำไมปลาช่วงนี้ที่เราเคยกิน ปลาถึงตายบ่อย” and suggests to Kru Noom that most of the causes as man-made. On the final poster (Image 6 below), Arm includes the “shock device” (Left bottom corner, second row), which he had asked Kru Noom about earlier, saying “So assuming there’s a machine to shock fish or a wood, which one would you use (to trap fish?) เราก็คงคิดว่ามีเครื่องช็อตปลา แล้วก็ไม้ ครูจะใช้อันไหน Kru Noom chooses wood, as a shock machine

“would be dangerous for us and for the fish, because suppose we use wood right, when we use it to trap fish, we can catch fish according to the size that we need but if we use the fish shock machine, that will be dangerous for us, dangerous for the fish. If we shock the fish in that area right, suppose if there is small fish too, they will die, and that would be dangerous for us as well.

มันอันตรายต่อปลา ต่อเราด้วย แล้วก็ต่อปลาด้วย เพราะว่า สมมติเราใช้เบ็ดไม้ใช้ไหม เวลาเราใช้ตกปลา เราก็ได้ขนาดของปลาตามที่เราต้องการ แต่ถ้าเราใช้เครื่องช็อตปลา มันก็เป็นอันตรายต่อเรา เป็นอันตรายต่อปลา ถ้าเราช็อตปลาในบริเวณตรงนั้น ใช้ไหม สมมติว่า มีปลาตัวเล็กๆ มันก็จะตายด้วย แล้วมันก็จะอันตรายต่อเราด้วย”

Arm is satisfied and nods in approval. Kru Noom in his response is already thinking about fish and the impacts on tools on their relations like the small fish that might die unnecessarily with the use of machines. This sensibility seems to be expanded with Arm's similar concerns and how technologies of today are impacting the larger ecosystems and the futures of fish. In contrast to the shock machine, Arm offers to make alternative tools that also work to protect fish. At the end of their Tema, Arm brings Kru Noom to make two kinds of bamboo spears (Image 6, first row) as alternative tools to the one available today. He calls them “old era” equipment which is juxtaposed to the very present way he was making and teaching with these tools.

Image 6. Kru Noom's final presentation poster on "Equipment for Trapping Fish"



Emplaced possibilities: Renewed relational and ethical sensibilities with tools and technologies

Kru Noom begins his presentation with all the kinds of fish Arm shared about, how they hear perceive humans, and why they hide, and how we should only catch only the fish we are going to eat, and to make sure that fish lives will continue into the future. This takes up around 10 minutes of out his 13 minute-presentation. Kru Noom even jokes with the team that we have not got to the equipment yet. He provides all this as the epistemological and axiological journey of the Tema, and places the kinds of fishing equipment within these new forms of relational and ethical sensibilities with fish that both he and Arm have co-created through social poetics together. The sequence of his presentation shows that the Tema has not just about fishing equipment but understanding the ethical gravity of the equipment though the lives of fish and our relation to them. As a continuation to their conversations, Kru Noom was interested doing further research on the various fishing styles across tribes. Learning the multiple techniques and equipment expanded the

ways in which Kru Noom was thinking about culturally-based knowledges, the epistemologies of fishing, and the ethics various of fishing methods and a desire to understand them in deeper ways.

Emplaced possibilities for Arm seemed to emerge because his worries about the lives of fish were taken seriously by an adult. The act of sharing these with his former teacher also expanded possibilities for how he imagined what learning could be and how he imagined himself. In Arm's post-Tutoría interview, he expresses that he could not imagine teaching a teacher. He shares, "we should learn things that are was close to his interests and our lives," implying that his own life and interests are important contexts for learning.

Summary: Social and ecological gravity and in group, consumption still stronghold

While Kru Noom already had relational sensibilities when thinking about fishing, this dialogic encounter with Arm seemed to introduce new forms of knowing from the perspectives of fish. This were openings for Kru Noom to see himself in reciprocal relations in his own life with the lives of fish. These new forms seemed to stabilize and deepen Kru Noom's sense of social and ecological gravity around decision-making in fishing, broader ethical considerations around tool choice and their impact on the natural world. I suggest that Arm introduced new epistemological forms such as broadening human reciprocal relationships with fishing, understanding fishes within their family structures, making visible relationships of rivers, forests, and bamboo wood as part of the practice of fishing. Personally for Kru Noom, designing with homelands seemed to renew and remember his sensibilities of protecting fish and other kinds in the natural world ; that newer technologies should not be used at the expense of sustaining forms of life. He says in a later story that Tutoría "is a growing opportunity to develop sustainably in the future **क्रमोगवामीโอกาสเกิดขึ้นและพัฒนาได้อย่างยั่งยืนในอนาคตครับ**" Relational narratives of sustainability seemed more present and important for Kru Noom now at school.

However, at the end of Kru Noom's presentation, one teacher asked again, so from methods and equipment of the past, which catches the most fish? Despite Kru Noom's verbalized sensibilities with the ethics of fishing, that question suggests that models of excess and consumption that mirrored commercial fishing were still desired from within original methods or technologies. Thus even though relational ethics were made visible through the presentation, it was easily to fall back into valuing neoliberal ideas of technology for mass consumption.

Tema 2: Akha Toys and Games- When social poetics is missed (Introduced above)

Tools and its ethical grounds were also explored between San and Kru Orn. In his Tema, San ask about the purposes of games, why we play them and the benefits of playing together. I present two episodes in their dialogue with regards to an Akha swing game and how San tries to share about the Akha swing within its larger relations with rice.

Episode 2-1: Why do we play?

San 6:28	<ol style="list-style-type: none"> 1. แล้วครูรู้รีไปล่าครับ 2. โล้ชิงช้านี้เล่นเพื่ออะไร 	So do you know why the swing is played?
Kru Orn 6:33	<ol style="list-style-type: none"> 3. โล้ชิงช้า ครูไม่รู้ว่ามีวัฒนธรรมจริงๆ 4. เขาเป็นยังไงเนอะ แต่คิดนะ คิดว่า 5. น่าจะเป็นการรวมชนเผ่า แล้วก็ 6. กิจกรรมร่วมกัน มี – 7. เขาเรียกอะไร มาพบปะเจอกันอะไร 8. อย่างเนี้ยใช้ไหม รีเปล่าไม่รู้นะ (.) 9. แต่เหมือนกับว่าเชิญ แต่ละหมู่บ้าน ก็ 10. เชิญมาเที่ยวอะไรอย่างนี้ (.) 11. แล้วก็มีการกินด้วยกัน 12. ของเล่นเล่นด้วยกัน อะไรอย่างนี้ (0.2) 13. ใช่ไหม 	The swing, I don't know the true culture of the swing. But I think, I think that maybe it is the tribal gathering and there are activities to do together. There is – they call it, come to meet like this right, or something I don't know (.) but it's like to invite but each village, also invites (people) to visit like this (.) and then there's food to be eaten together, play toys together something like that, right?
San 07:14	<ol style="list-style-type: none"> 14. เขาจะเล่นในฤดูที่ 15. ปลูกข้าวเสร็จแล้ว 	They play it during the season when the rice planting is finished.
Kru Orn 07:19	<ol style="list-style-type: none"> 16. เหมือนว่างงานแล้วอะไร (.) 17. อย่างนี้ใช่ไหม 	When the planting is finished (.) like that right?
San 07:23	<ol style="list-style-type: none"> 18. แล้วก็เขาจะเล่นเพื่อ จะ 19. เร่งผลผลิตให้ดี 	And then they play to speed up the rice harvest and make it good
Kru Orn 07:27	<ol style="list-style-type: none"> 20. อ้อหรือ อ้อ หมายถึงว่า ถ้าเรามี 21. ความสุขอะไรอย่างนี้ใช่ไหม 22. ผลผลิตก็จะออกมาดี (1.0) 	Ohhhh, really, ohhh, meaning that if we are happy or something similar right, our harvest will also be good. (1.0)

When San asks about why the swing is played, Kru Orn acknowledges that she does not know but guesses that “I think that maybe it is the tribal gathering and there are activities to do together... I don't know but it's like to invite but each village...there's food to be eaten together, play toys

together something like that, right?” Kru Orn just offers various ideas about what the Big Swing festival and game is about, repeating “I don’t know” but “it’s something like that right” (Line 3, 8, 12-13, 17).

Saramorn reframes the Akha swing game within its larger social, temporal, and ecological relations. He says “they play it during the season after the rice planting is finished” (Line 9-10). The purpose of play is not just for human social leisure, but for the health of rice, to help “speed up the rice harvest” and “make it good.” When the Akha big swing game is played, how it is played (to go fast) was part of relationships with rice and its health.

Kru Orn in repeats what San shares but adds a “อย่างนี้ใช่ไหม like that right” (Line 17) and add when she adds to human feeling that “if we are happy or something similar right, our harvest will also be good” which seems a little different from playing on the swing being an act to help speed up the rice and make it good.

Kru Orn’s thinking *about* games seems to miss San’s ethical orientation to the Akha swing game and asks about it again further on in their dialogue (Ep 2-2, Line 3). This prompts San to reframe the Akha swing game again with her.

Episode 2-2 Playing is Ceremony

San 20:05	1. คนเผ่าของครุมีพิธีกรรมอะไรบ้างครับ 2. ที่เอาของเล่นไปร่วม	What ceremonies does your tribe have that uses games together with it?
Kru Orn 20:10	3. ไม่มี ของเรามีไหม	There aren’t. How about from yours?
San 20:15	4. ก็ เหมือนกับ โส้ชิงช้า	Well, it’s the same as the swing.
Kru Orn 20:21	5. เอาไปร่วมกับพิธีกรรม	It’s comes together with the ceremony.
San 20:24	6. เล่นเป็นพิธีกรรม	Playing is ceremony.
Kru Orn 20:30	7. ส่วนมากเขาจะทำหลังจากตกข้าว 8. ใช่ไหม	Mostly after the rice planting right?
San 20:32	9. ครับ	Yes.

When hearing that the swing was an example of how games are connected to ceremony, Kru Orn says the game “comes together with the ceremony (Line 5). San reframes this to share that playing in itself “is ceremony” (Line 6). Across these two episodes, Kru Orn’s use of “something like that right?” or “right” (Ep 2-1, Line 12-13; 17 & Ep 2-2, Line 8) seemed to indicate a slight resistance

to be wrong and instead making sure she knew *about* games, rather than allowing herself to struggle with and be impacted by this new epistemological form that reframes games as part of larger relational practices. Kru Orn then repeats, “Mostly after the rice planting right?” (Line 7-8), reinforcing simply knowing *about* the practice.

Challenges: Aboutness thinking that commodifies ethical sensibilities and reinforces power

Games and toys as technologies are placed within larger ceremonial relations, in particular, with rain and rice growing and harvesting. Similar to the tools that Arm introduced to Kru Noom, San here introduces how our games and tools come from particular histories and relations. Kru Orn’s responses here contrast to Kru Noom’s (and Kru Jan’s) struggle with new epistemological forms and how they moved to “‘dwell on, with, or within’ them for a while, gradually gain an orientation toward them” (Shotter, 2005, p. 46). Here, Kru Orn seems to miss the point and commodifies ethical sensibilities to reinforce power and dominance of knowing over rather than with or through, such that we too are changed by these new forms.

San and Kru Orn potentially illustrates what can happen if teachers are not practiced or willing to listen – question or struggle *with* new epistemological, ontological, and axiological forms and knowledge systems. These two cases – trap fishing and Akha games show how felt dynamics and being moved by new forms of knowing is an important part of social poetics (Shotter, 2010). Indigenous young people carry with them relational and ethical considerations and concerns about relations to the natural world and what we would lose if the fishes were not protected or if games lost their meaning. Felt struggles allow for renewing and expanding emplaced possibilities of these new forms and sensibilities, here to orientate to Akha axio-onto-epistemological forms that understand games and ceremony as part of the same practice, where games have purpose to relation to rice harvesting.

5.7 POETIC & POSSIBILITIES THREE: DESIGNING WITH HOMELANDS TOWARDS
INTERDISCIPLINARY NAVIGATIONS ACROSS HOME AND SCHOOL

In the following two Temas, I examine how affect and love for land-based practices expanded teacher’s imaginations of disciplines. In both rice farming and innovation with coffee husks, these young people shared about a love for these practices that allowed teachers to see new possibilities

for teaching and learning within and across disciplines, in particular for the teaching of Thai language and Biology. I then discuss how these navigations could also reinforce state goals and capitalistic agendas at school.

Tema 4: Rice Planting, Growing, Harvesting with Mali and Kru Yai

Mali is 12 years old and a northern Thai rice farmer with her family. She lives about a 10-minute drive from Sahasat school with her cousins and grandmother. At short walk from back of their compound leads you to a rice field of about 10 rai³⁴ in area where Mali spends time with her family planting rice twice a year. When thinking about an important family practice, Mali wanted to teach this Tema thinking about the future of rice growing. Mali prepared this Tema with her grandmother and reflects in her post-interview:

Nowadays there aren't that many people who do rice farming like this. In the future, it is possible that there will be no rice farming anymore... so it is possible to share this with those who might never have grown rice before, or to share with people who have different ideas so they know that this is a Thai tradition since a long time ago, from way back, how people have farmed rice... sharing this knowledge to friends and other people and also families, that this can keep developing.

เพราะว่าปัจจุบันก็ไม่ค่อยมีใครทำนาอย่างนี้เยอะ อนาคตอาจจะไม่มีการทำนาเลยก็ได้...จะได้แบ่งปันกับคนที่ไม่เคยได้ทำ หรือว่ากำลังความคิดแตกต่างกัน ให้เขาได้รู้ว่าเป็นประเพณี (ไทย) ตั้งแต่สมัยก่อนว่า ตั้งนานแล้ว การทำนา...คือการได้แบ่งปัน ความรู้แก่เพื่อนๆ และคนอื่น และก็ครอบครัวค่ะ เพราะว่าจะได้พัฒนาต่อเนื่องกัน

Kru Yai is Mali's current Thai teacher in Grade 6. She one of the older teachers of the group who teaches Thai language at Sahasat. At this point in time, Kru Yai has been teaching at Sahasat for over 20 years and retires in the next 5 years. She has never planted rice before “ไม่เคยเลย” in her 60 years of life. She took this Tema because she was interested in the topic but also because she felt bad if Mali did not have anyone who chose her Tema.

³⁴ ไร่ or rai in English is a measurement of area where 2.52 rai is makes up about an acre.

Mali begins her Tema this way.

Episode 4-1: What could we eat to replace rice?

Mali 01:38	1. แล้วเราสามารถกินอะไรแทนข้าวได้ไหม	Well, what could we eat to replace rice?
Kru Yai 01:47	2. กินอะไรแทนข้าวได้ ชนนปัง 3. แต่ไม่อิ่ม	To replace rice, maybe bread but we won't be full.
Mali 01:55	4. สารที่เราได้รับจากข้าวจะมีอะไรบ้าง	What nutrients do we get from rice?
Kru Yai 02:00	5. คาร์โบไฮเดรต วิตามิน ไขมัน	Carbo, vitamins right?

While Mali starts off with an important question “what could we eat to replace rice?” Kru Yai gives bread as a potential substitute but “we won’t be full” (Line 3). There is an opening to explore what it means to be “full” and why bread does not replace rice. However, Mali moves onto the next question to make it *about* the nutrients of rice, rather than rice as a longstanding cultural practice as she expresses in her post-interview.

For the most part of their dialogue, Kru Yai jots down notes and facts about rice planting in a notebook. In the next episode, they continue conversing through the multitude of processes for rice growing such as drying the grains, collecting the hay, needing to keep the hay in the case of rain. Kru Yai comes to learn that growing rice is a tedious process and Kru Yai asks Mali if she would sell the rice field.

Episode 4-2: Would you sell it?

Mali 20:02	1. มันก็ไม่ได้แพงอะครู 2. แต่ที่พวกหนูใช้วิธีคือเอาข้าวมา 3. ปูผ้ายางแล้วก็ตาก 4. แล้วก็ตากแดดอะครู	It (The machine) is not expensive. But what I use is to bring rice to the rubber mat and then dry and then dry in the sun.
Kru Yai 20:10	5. แล้วถ้าเกิดฝนตกล่ะ	And if it rains?
Mali 20:31	6. ถ้าฝนตกก็เก็บอะ	If it rains, we collect it.
Kru Yai 20:34	7. เก็บข้าวไว้มีที่เก็บ ไขมันอะ 8. มียังข้าว ไขมัน	Collecting rice there's still to hay to collect right?
Mali 20:41	9. ไขมันพวกหนูก็เก็บไว้เป็นกระสอบๆ	Yes. We keep them in stacks.

Kru Yai 20:44	10. เก็บไว้ในยุ้งน่ะ	You keep them in the barn?
Mali 20:46	11. มียุ้งให้เก็บ	There's still hay to collect.
Kru Yai 20:58	12. เคยคิดว่าถ้าเราเป็นเจ้าของนา 13. แล้วจะขายไหม?	Have you ever thought if you were the rice field owner, would you sell it?
Mali 21:00	14. ไม่ขาย ที่นาก็แพงอยู่แล้ว (6.0)	I won't sell it. A rice field is already expensive. (6.0)

From Line 1-11, Mali talks about process the rice after it is harvested. She mentions bringing the rice grain to dry and needing to collect it if it rains and even after all that is done, “there’s still hay to collect” (Line 11). Kru Yai seems to feel like growing rice is too tedious and asks “Have you ever thought if you were the rice field owner, would you sell it?” (Line 12-13). To her selling the rice field for quick gain is easier, instead of needing to take care of the rice and using economic labor at home. Her question similar to Kru Jan’s questioning of settled knowledge for increased human ease and convenience. Mali is responds almost immediately, saying “I won’t sell it. A rice field is already expensive” or worth a lot (Line 14). Here, the detailed process of rice farming was a kind of new form for Kru Yai that she is trying to gain an orientation to. However, Mali’s refusal to sell the rice field was a new form of thinking for Kru Yai. In her post-interview, Kru Yai speaks of this moment with Mali. She shares that the decision to not sell the field was evident of Mali’s love for the practice to planting rice, and that this was a way that designing from home with linked to the teaching and learning the Thai language.

For example, speaking or expressing one’s feelings is also possible. Because she has the feeling of loving her rice field, something like that. She doesn’t want to sell it. She wants to keep it. She wants to continue doing this as an occupation. This means that she still wants to do it. Although she also studies other subjects, she knows from within herself that she is a rice farmer. She knows all steps how to do it because she is still a farmer. She won’t think of selling the field. She won’t sell it. She won’t sell her rice field. She can talk about this in her classroom. It’s a discussion and a speech about expressing one’s feelings.

เช่นการพูด หรือการพูดแสดงความรู้สึกอะไรอย่างนี้ก็ได้ เพราะว่าเค้าจะมีความรู้สึกที่เค้ารักในผืนนาของเค้าอะไรอย่างเนี่ย เค้าก็ไม่อยากจะขาย เค้าก็อยากจะทำอย่างนี้ เค้าก็อยากจะทำอาชีพอย่างนี้ ต่อ แปลว่าเค้ายังอยากทำอยู่ ถึงแม้ว่าเค้าไปเรียนวิชาอื่นๆ แต่เค้าก็ยังรู้ตัวว่ายังเป็นชาวนาอยู่ เค้ารู้ขั้นตอนวิธีทำอะไรหมด เพราะว่า ไม่ขาย ไม่ขายที่เค้าก็ยังเป็นชาวนาเค้าก็จะไม่คิดว่าจะขายมัย ก็ นา เค้าก็เอามาพูดได้ การพูดในชั้นเรียน การพูดการบรรยาย การพูดแสดงความรู้สึก

Introduction of new forms and felt dynamics: Affect for land-based practices

Mali's hypothetical unwillingness to sell the rice field was a "different point of view" a new form that Kru Yai *felt*. For Kru Yai, Mali's knowledge about how to care for the rice and the land and love for planting, growing, and harvesting rice was evident in her answer to keep at it. In a sense, Kru Yai allowed for Mali's love for the practice to "become familiar" to her (Shotter, 2010, p. 46), and to become a teaching for own life.

Emplaced possibilities for Kru Yai: New Attention & Disciplinary navigations

First, while Kru Yai did not expressed in this moment, Mali's sharing expanded Kru Yai's anew awareness to "pay attention" to the work of rice growing around her in her post-interview. Kru Yai shares that this Tema gave her a new appreciation for rice. She says:

"I feel that it's so beautiful. But, we live among farmers, right? Our houses are close to rice fields. When we drive anywhere, we can see only the fields around. We don't pay attention about what they do first, how to they cultivate the rice, how they sow, what kind of grain they use, how many days they culture the rice. I have never paid attention to these things. When I learned about them, I went back and did some research in the Internet and I found that before farmers sow the rice seedlings, they have to be immersed in water first and then they are sowed. After sowing, farmers have to keep watching. Then I feel that its price is quite cheap and it's not worth farmers' manpower."

รู้สึกว่าได้งาม แต่ว่า เราก็อยู่คลุกคลีกับชาวนาไข่ม้อย บ้านเราก็อยู่ใกล้ท้องนา เวลาขับรถไปไหนก็เห็นแต่ทุ่งนา แต่เราไม่เคยใส่ใจว่าเอาตั้งแต่เริ่มแรกเนี่ย ค่าเพาะกว่าค่าจะมาหว่าน กล้าได้ค่าต้องใช้ข้าวยังงี้ ค่าเพาะอะไรก็วันเจ็ย เราไม่เคยใส่ใจ พอเราได้มาเรียนรู้เราก็ได้กลับไปค้นดูในอินเทอร์เน็ตว่าอ้อ กว่าเราจะมาหว่านได้ต้องเอาไปแช่น้ำก่อน แล้วก็ถึงจะหว่าน แล้วหว่านก็ต้องดูแลอะไรเจ็ย รู้สึกว่าราคามันก็ถูกเนอะคะ มันไม่คุ้มกับที่ทำ กับแรงงานของชาวนาที่ทำ

Her new appreciation for rice farming even drew her to do further research on the internet and growing concerns that the price for rice does not commensurate with the work that farmers do.

Second, seeing her student speak and express herself in terms of something that mattered to her was a link to how Kru Yai imagined Thai language teaching. When asked about this in her post interview, Kru Yai said designing with homelands makes sense to her because students "could speak about it" to show what they know and express how they felt". In a sense, this might be a way to breaks disciplinary grips that teachers have to their subject-content matter. Katz & Shotter (1996) remind us that we are often socialized to focus on sustaining professional discourses,

agendas, and forms of life. Kru Yai has shown that remembering our own everyday ways of relating to others not only expands heterogeneous possibilities for Kru Yai’s own relationship to the object of rice farming but also matters for how she could imagine teaching language anew. In Kru Yai’s opinion, student’s felt desires and experiences – their love for family practices – could be important contexts for teaching and learning.

Finally, such attunement to Mali’s feelings and sensibilities with rice farming shifted the conversation dynamics slightly after the 21st minute to focus on family and community life. Below is an excerpt of some parts of their conversation after minute 21. Prior to this episode, Kru Yai and Mali talk about Mali’s new baby sister from her new stepdad.

Episode 4-3: Can you draw the house?

- | | | |
|------------------|---|---|
| Kru Yai
25:01 | 1. พวกหนูจะได้มีห้องส่วนตัวกันใช่ไหม | So you can have your own room right? |
| Mali
25:03 | 2. มีแม่มีพ่อ 2 ห้องไป แล้วก็ผู้ชาย 1 ห้อง มันมีอยู่ 5 ห้องที่จริงเขาก็ให้อยู่เช่าเอา ที่จริงบ้านหนูก็เหมือนอยู่ข้างในแล้วก็พอกับแม่เล็กนั้นก็เลยย้ายเข้ามาอยู่ | There’s mom and dad and 2 more rooms to go. And there’s my uncle 1 room, there are 5 rooms that are rented out. Really we were living inside and then when my dad and mom split up so we moved in here. |
| Kru Yai
25:23 | 3. แล้วบ้านหลังนั้นล่ะ | Then the house that you had? |
| Mali
25:24 | 4. บ้านหลังนั้นก็ให้ยายอยู่ | That house is given to my mom’s grandmother. |
| Kru Yai
25:29 | 5. ห้องของหนูนี่เปิดออกมาก็เป็น
6. ในบ้านหรือว่า คุรุไม่เข้าใจ
7. หนูลองวาดแผนผังบ้าน | So your room is open and you just come out?
Or inside the house, I don’t understand.
Can you draw the house? |

Kru Yai keeps asking about Mali’s living situation and in the end, asks her “can you draw the house” so she can really understand where she lives and how her room is like. In this sense, through an experience of what I suggest is a kind of social poetics, their conversation shifted to Mali’s life and understanding her as a full person, not just someone who was teaching about rice growing.

As discussed previously, schools are often keen to sever relationships to lands and home. It deemed more prestigious and therefore encouraged to work at a desk than to be a rice farmer. Modernity and development narratives promote moving away from land to structure a loss of land-

based knowledges. Designing with homelands helped teachers pay attention to land-based practices in their community, elevate the interests, concerns, and knowledges of young people, and reimagine their own disciplines as connected to these practices with lands within family life. Teachers thinking with Mali's interests and concerns to be with land added to the continual unfolding of events at Sahasat to try to reimagine school and re-mediating reconnection across schools and families' lands and homelife.

Tema 5: Coffee Husk Tea by Fa and Kru Rungroi

In this Tema, Fa similarly shares a desire to learn and innovation from within land-based practices and knowledges to highlight her village's creativity with coffee.

Fa is a 15 year-old student who is seen as average in some subjects and poor in others. She is from Baan Pa Hi (บ้านผาฮี้), an Akha village in mountains that stand at over 4600 feet above sea level. On the drive to her village, we drove along a woven bamboo fence arbitrarily dividing the two countries, Myanmar and Thailand. There was a red, green, and yellow starred flag for Myanmar on one side, and the red, blue, and white Thai flag in front of a police outposts that guards the border and vast mountains on each side. Fa describes her village as a coffee village, and this Tema was important because “กาแฟคือเป็น เหมือนกับว่าเป็นอาชีพหลักของหมู่บ้าน coffee is like the vocation of our village.” She provides a brief history of coffee and her village. The village was not always a coffee village, they had in fact used to grow opium until the King Rama IX came up to her village to introduced coffee as an alternative crop. This Tema has that history and it features a new village innovation to create product that uses the leftover coffee husks and to see what they could do with it “แต่ว่าอันนี้คือเค้าเหมือนกับว่านำมาทำเป็นผลิตภัณฑ์ใหม่ คือเห็นว่า แบบเปลือกกาแฟที่ไม่ใช้แล้ว” Fa designed this Tema with the help of her mother as something they were innovating on at home.

Kru Rungroi chose to work with Fa, his current student, on this Tema because he liked to drink tea but never really explored how to make it. Kru Rungroi is head of educational quality at Sahasat. He teaches Grade 10 – 12th biology and is Isarn or the northeastern part of Thailand.

Image 7. Kru Rungroi's final poster titled, "Coffee husk tea"

Coffee husk Tea

Background: **Coffee** is a kind of plants grown in community (It's well liked and planted). There are **husks** left behind after the removal of coffee beans.

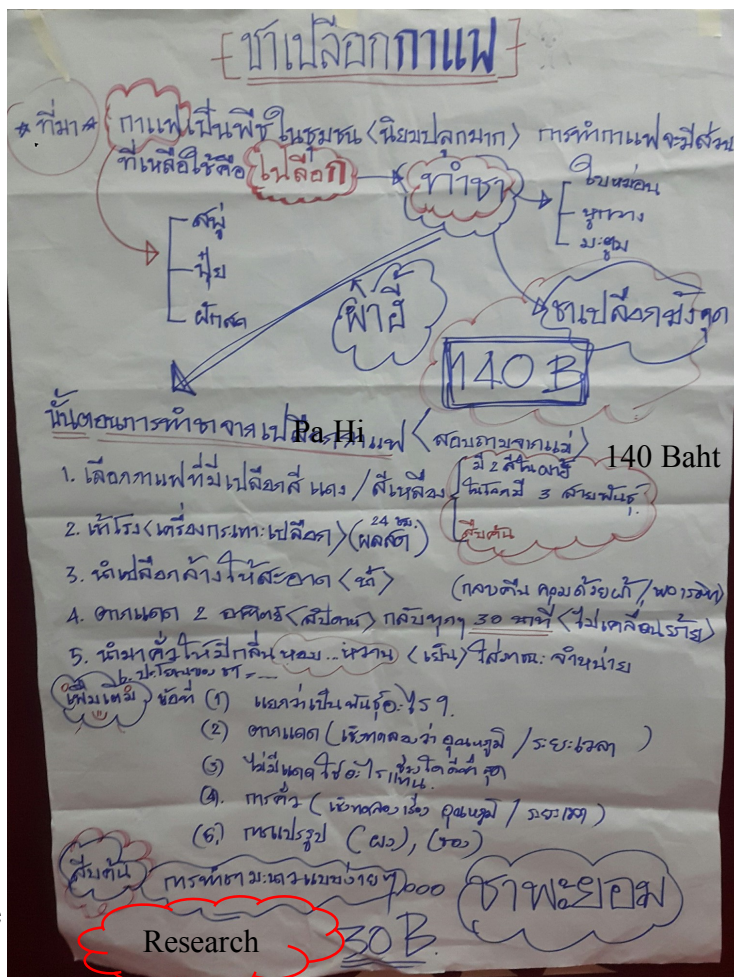
- Husks**
 Soap
 Fertilizer
 Fresh vegetable

Steps of making cascara tea

1. Choose the red or yellow coffee beans
2. Input the beans to (the husk peeler device) (fresh beans)
3. Wash the beans (water)
4. Dry them in the sun for two weeks and turn them every 30 minutes (don't move) (At night, cover with clothe/plastic)
5. Roast them until they give sweet

Addition: Benefits

1. Differentiate what species they are
2. Dry in the sun (experiment on temperature/duration)
3. Without sun, what can be replaced, when I the best
4. Roast (experiment on temperature/duration)
5. Transform (powder), (pack)



Making Tea
 Mulberry
 Sea almond
 Bael fruit

Mangosteen Husk Tea

There are two colors at Baan Pa Hi.

There are three types in this world.

Payom Tea

Episode 5-1: There's something else coffee can be used for

Fa presents this Tema as something new that her mother and other villagers were just starting to try out in her village. She begins by asking Kru Rungroi besides tea leaves, what else can we use

to make tea? ชานะคะ นอกจากจะทำมาจากใบชาแล้ว เราสามารถนำอะไรมาทำเป็นชาได้อีกบ้างคะ.
She then proceeds to ask what else could coffee be used for. Their dialogue is as follows:

Kru Rungroi 02.02	1. (หัวเราะ) เป็นผักสดใจ ใบอ่อนนะ 2. ลาบ แล้วก็ที่เขาเอาไปทำคือก็คือ 3. กาก กากกาแฟนะ กากของมัน 4. เค้าเอาไปทำปุ๋ย เอ่อ ทำปุ๋ยนะ 5. ทำปุ๋ย ก็แค่นี้ที่รู้อะ	(Laughs) It's fresh vegetables, young leaves, larb (salad), that they use to make it and then grounds, coffee grounds, those grounds, they use it to make fertilizer, to make fertilizer, that's all I know.
Fa 02.26	6. แล้วก็มันสามารถมา 7. ทำอันนี้ได้อีกคะครู สนุกกาแฟคะ	There's something else that coffee can be used for, coffee soap.
Kru Rungroi 02.28	8. ไหน เอออันนี้ก็เคยเห็นชาวบ้าน 9. ทำอยู่มาทำเป็นส่วนผสมของสบู่ 10. สนุกกาแฟ หมายความว่าเค้าก็ 11. ทำสบู่ทั่วไปนี่แหละใช่มั๊ย แล้ว 12. เค้าเอาส่วนไหนของกาแฟไปใส่	Where? I've seen villagers still making a mixture for soap, coffee soap, that means they make soap in general right? Then what part of the coffee do they put in it?
Fa 02.42	13. เค้าเอาเมล็ดอะคะครู เอาเม็ด 14. ไปบด แล้วก็เขาเอาไปใส่	They use the seed, take the seed and mash it up, and then use that to put in.
Kru Rungroi 02.46	15. เหมือนเนื้อที่เราเอามาผสมเป็น 16. กาแฟนี่นะ (.) ที่มันเป็นผงๆ (.) อะนะ	It's like when we took it to mix, That coffee (.) then it was powered (.) That.
Fa 02.52	17. เขาก็เอากาแฟละลายน้ำ	Then they make it coffee that's soluble
Kru Rungroi 02.54	18. เออๆ มันเพื่อทำไมเค้าเอามาทำ 19. มันไปช่วยอะไร? 20. มันเอาไปกินเป็นคาเฟอีนมั๊ย	Ehh, why do they use that to make it? What does that help with? Do they take that to eat the caffeine?

As Fa asks about the kinds of things that can be made with coffee, this expands a sense that villagers are always experimenting and trying out new things. They are learning from what other teas are made from and how to use all the parts of the coffee plant. Kru Rungroi in writing his reflection with Fa, and projects this on Fa. He draws out a scenario of what could be possible after this Tema. Fa listens and nods:

1. After I have learned with you, I have birthed a new idea for you to go home and really learn

2. this (coffee husks), especially even more so to do it in thorough detail. You can do it as a
3. project or whatever. When we know how to do it thoroughly, we can see the steps that is
4. needed to roast right? Like if we set the time to roast it for 30 minutes, how much heat
5. should we use? How many grams? Then it gives smell. The smell is different, the taste is
6. different. We roast 30, roast 35, roast 40, roast for an hour, which one gives better smell,
7. and which tastes the best? That is a way to bring the learning that
8. we've done in science topics to be a topic of scientific experimentation so that we can have
9. the best formula for Pa Hi. Then once we have the best roast, then we grind it to make it
10. fine. Make it more detailed. We make the tea soaked in hot water, but if we grind it into
11. powder, and make it look like Lipton tea. We can send it to him to make tea, like the honey
12. lime tea or a pulled tea. Coffee, but like tea [...] We can help each other do it at home, or
13. keep it at the store. This also makes us come to learn in interdisciplinary ways.
14. We can also help at home, help the community.

1. หลังจากท้อ.บุญรุ่งได้เรียนรู้จากหนูนะ อ.บุญรุ่งเกิดความคิดให้หนูกลับบ้าน แล้วไปเรียนรู้
2. จริงๆสิ่งนี้ โดยเฉพาะอย่างยิ่ง ขั้นตอนการทำอย่างละเอียด หนูจะให้เป็น
3. โครงการ หรืออะไรก็ได้พอเราดูอย่างละเอียดปั๊บ เราจะเห็นขั้นตอนที่นำไปคั่ว
4. ใช้มัย สมมุติเราตั้งเวลา 30 นาที
5. ใช้ความร้อนเท่าไร ใช้กี่กรัม แล้วมันจะให้กลิ่น กลิ่นมันต่างกัน รสชาติต่างกัน
6. เราคั่ว 30 คั่ว 35 คั่ว 40 คั่วเป็นชั่วโมงเนี่ย อันไหนได้กลิ่น
7. และรสชาติดีกว่า มันก็เป็นการนำความรู้ที่เราได้เรียนมา
8. ในเรื่องของวิทยาศาสตร์เป็นเรื่องของการทดลองทางวิทยาศาสตร์ แล้วเราจะได้สูตรที่ดี
9. ที่สุดสำหรับผะฮี้ ฉะนั้นพอเราได้คั่วที่ดีที่สุด แล้วเราเอาไปบดให้มันละเอียด อันนี้
10. คราว เราทำชาเอาไปแช่ในน้ำร้อน แต่ถ้าเราเอาไปบดเป็น
11. ผง แล้วเราเอาไปทำเหมือนชาลิปตัน เราเอาไปส่งเค้าเหมือนที่เค้า
12. ทำชาเนี่ยชาน้ำผึ้งมะนาว หรือชาชกเนี่ย กาแฟแต่เป็นชา [...] เราซื้อเราก็ไม่ต้องมีส่วนเกิน
13. ช่วยกันทำทั้งที่บ้าน หรือไปไว้ที่ร้าน นี่ก็ทำให้เราที่มา เรียน หนังสือที่สหศาสตร์เนี่ยนะ
14. เราก็ไปช่วยที่บ้านได้ ช่วยชุมชนได้

Emplaced possibilities with Kru Rungroi: Interdisciplinary and reciprocal learning across school and home

For Kru Rungroi, he now was able to expand the possibilities of what schools could do to support village innovations. As a biology teacher, he uses “scientific experimentation” to draw connections to how the processes of creating a new product could be tested and refined in a “detailed” way. He gives the example of roasting at different time intervals (30, 40, 45 minutes) to compare the smells and tastes of this tea and perhaps even package it for sale (Line 4-12). He can imagine a project specific to Baan Pa Hi, and specifically with Fa and her mothers’ interests and experience. Designing with homelands for Kru Rungroi afforded possibilities of interdisciplinary and reciprocal learning across home and school in two ways (Line 14 -16). First, in his opinion, Fa’s interest in coffee with her community expanded possibilities to see how school-based science and its disciplinary practices could support land-based innovations to “help at home, help in the community” (Line 16). Second for Kru Rungroi, it seemed that expanding land-based practices

such experimenting with coffee husk tea “makes us come to learn in interdisciplinary ways” and also contributed to learning science at school.

Emplaced possibilities with Fa: School a meeting place for land-based knowledges & innovations

Fa in her post-interview took up expanded possibilities in another way.

1. For me, I want to make this (designing with homelands) continue for myself,
 2. I want to have a way to present the wisdom of mine in a classroom like this.
 3. I know in my classroom there are others who grow coffee too and there are also products
 4. that from their villages like teas and coffees, like that. But villages that have tea and
 5. coffee to bring it and exchange these knowledges together and then we can bring it back
 6. to apply in our own villages.
-
1. ของหนูก็อยากให้มีต่อไปเรื่อยๆค่ะ สำหรับตัวหนูนะคะ
 2. หนูอยากให้มีการแบบนำเสนอภูมิปัญญาของตัวเองให้ภายในห้องอย่างเนี้ยค่ะ
 3. คือห้องหนูก็มีคนที่ปลูกกาแฟด้วย แล้วก็ผลิตภัณฑ์
 4. ของหมู่บ้านเขาก็จะเป็นแบบ ซากั๊กกาแฟ อย่างนี้ค่ะ แต่หมู่บ้านจะเป็นซากั๊ก
 5. กาแฟแล้วก็เราก็นำมาเปลี่ยนความรู้กันแล้วก็สามารถ
 6. นำมาใช้ประโยชน์ในหมู่บ้านของตนเองได้

Fa’s post-interview suggests that designing with homelands for her had implications on how she began to see herself and her classmates, and how she imagined schools as a meeting place for the exchange of land-based knowledges. After the Tutoría session, Fa mentions wanting to “have a way to present the wisdom of mine in a classroom” (Line 2) and to “exchange these knowledges together” with others in her class who also work with tea and coffee at home (Line 5). Her use of “exchange” signals a concern with ensuring that learning at school is reciprocal and also responsive to differentiated lands, where the purpose and possibility of these exchanges should ultimately be application in “in our own villages” (Line 6). I suggest that Fa here, begins to think about how she could facilitate an exchange of designs within and *across* homelands for others at school. Designing with homelands seemed to be an opening for Fa to reimagine purpose of school towards to differentiated community ends, and collectivizing through reciprocal learning with her classmates.

While Kru Rungroi and Fa’s reflections were ideational, they could contribute to larger stabilizations to repair the otherwise fragmented lives across the landscapes of home and school where new imaginations of school and its purposes were possible. Through designing with

homelands, there seemed to be emplaced possibilities to navigate across disciplines and knowledge systems of school and home in reciprocal and generative ways. Land-based practices at home could be contexts for interdisciplinary learning at school, and schools were reimagined to be spaces to share, hybridize different innovations that mattered for community advancement, flourishing and well-being (Gutiérrez, Morales, & Martínez, 2009).

Challenges: Reinforcing state goals and capitalistic agendas

Kru Rungroi and Kru Yai's renewed imaginations of their disciplines could afford navigational possibilities at home and school to sustain and add to the vibrancy of home and land-based practices. However, there is a fine line between for example, Mali's love for rice farming adding to Thai language learning and appropriate these practices to simply reinforce state goals of "Thainess" (Keyes, 2008). Similarly, the "scientification" of these coffee harvesting practices, could reinforce capitalistic goals of production. Science and scientific experimentation could be useful tools for Fa and her village but the ends of production need to be clear if not it further reinscribes problematic neoliberal narratives of progress that schools begin to impose on village life. We need to be critically aware of how learning with home practices can slip back into the reproduction of the very dominant relations of power we seek to critique and transform.

5.8 DISCUSSION

This paper offers a critique into current conceptions of what counts as knowledge and how we can design to bring the felt knowledges and theories from the lives of Indigenous young people into settled school spaces in Thailand (Million, 2008). In designing with homelands with Tutoría, we were concerned with re-creating the conditions by which meaning-making with lands could occur in school, where the context is the curriculum and young people's sense-making in the grounded experiences and contexts of their lives on land were upheld and valued (Cajete, 1994; Million, 2008; Simpson, 2014). In this way, knowing and understanding refuses decontextualization. Theories of technology, production, and consumption, its ethics and uses emerge from webs of interdependent relationships with lands, family, and community "that are different and valuable because of that difference" (Simpson, 2014, p. 11). I suggest that both living social poetics within Tutoría *and* land-based design were two interrelated processes that pushed on and expanded

concepts and settled goals at school in three ways: (1) re-envisioning the purposes and practices of making as alternatives to consumption and production, (2) renewing ethical considerations of tools and technology through deepened relationships with the natural world, and (3) expanding the purposes of school towards community futures *and* the scope of subject disciplines taught at school.

First, a social poetics framework helps to make visible how we were in relation with each other mattered for renewing connections and commitments to lands and families. It seeks to analyze and critique how poeisis, the co-creation of unfolding moments with one another –is intimately entangled with power. Living with social poetics in this paper translated to a willingness to struggle, listen, and allow ourselves to be impacted by another, created emplaced possibilities for teachers and young people. Listening (through questions, struggles, and affect) to be impacted by another refuses normative relations of power school. In Thai, we call this **เปิดใจ** – to have an open heart, so that goals of professionalism do not overrule the concern for the *person* (Deloria Jr. & Wildcat, 2001, p. 46). Conversely, an unwillingness to listen can continue to re-inscribe who holds knowledge and power. This paper illustrates how teachers could only make meaning with lands and diverse knowledge systems if they opened themselves to such possibilities of being and thinking *with*. Such vulnerabilities allowed for everyday Indigenous resurgences to live in the hearts of teachers.

Second, it is important to highlight that ethics from land-based Indigenous knowledge systems formed the base of these expanded possibilities and Tutoría dialogue was a tool by which to enact and en flesh them in moment-to-moment, pedagogical, and structural ways. Simply engaging in social poetics without land would not have surfaced axiologies, aesthetics, ethics, and politics that move us closer to renewing relationships and re-mediating the fragmentations of home-school lives that are otherwise so pronounced for Indigenous young people in Thailand.

As the data suggests, these openings are never complete or foreclosed. Expanding emplaced possibilities for the young people and teachers at times reified colonial and capitalistic narratives that are entrenched in school. At many times throughout the Tutoría, colonization is still felt and present (Million, 2008). For example, families were not physically involved in this session and the

separation of school and community life is still a daily reality and form of violence on many Indigenous communities (Kwanchewan & Prasit, 2009; Marker, 2006). Furthermore, Tutoría and many other instructional interventions could reinforce schooling for empire if we are not focused on enacting connections back to land, family, and each other in ways that renew our relationships and responsibilities to ongoing community practices and family-led work. Without a relentless awareness toward Indigenous futures and leadership in schools, this work could simply repackage and reproduce the historical and everyday inequities that we seek to transform (Bang & Vossoughi, 2016; Booker et al., 2014; Martin, 2009). This is especially critical because there already is so little effort to contextualize the work of education within greater wholes that include families in decisions about what values, orientations and relationships should be central in school life (Bang et al., 2018; Baquedano-López et al., 2013; Cajete, 2008; Ishimaru, 2014; Ishimaru et al., 2019). What was interesting about the data was that despite the lack of direct parent and family involvement in the teaching and decision-making in this event, it seemed that families and communities were reframed differently because of it. Three months after the designing with homelands event, 11 out of the 17 teachers made explicit the need for families and communities to participate in the Tutoría learning network because homeland knowledges contributed to the intellectual vibrancy of school (See Article 1). Designing with homelands with social poetics could potentially help disrupt deficit framing of parents and normative power relations typical of work across families and schools (Bang et al., 2018; Ishimaru et al., 2019).

As Carol Lee (2001) reminds us, good teaching is built from a mortar of love and respect. Designing with homelands grew out of and was aimed at expanding the love and respect we had for children and the contexts, practices and lands, they called home. Schooling as an arm of the colonial state has not only ignored socializing teachers into loving relations with children and families, it has structured the epidemic loss of land-based knowledges on a global scale (Bang et al., 2014; Mignolo & Tlostanova, 2006; Tuck & Yang, 2012). Western notions of modernity translates to participation in the socioeconomic machine where separation and domination “form the boundaries between the human species and other forms of life” (Deloria Jr. & Wildcat, 2001, p. 45). In Indigenous education in Thailand where weakening homeland connections is encouraged by school, designing with homelands set in motioned renewed poetics and possibilities for students and teachers to disrupt that and reclaim “land as first teacher” (Bang et al., 2014). As students

(re)storied homelands and important practices with their teachers through dialogue, new forms of utterances, epistemologies, and disciplines were co-created through felt dynamics and expanded the navigational possibilities within and across school and home. I suggest that these changes are prefigurative (Vossoughi & Booker, 2017; Yates, 2015) - transforming the relationship and forms of participation at school also allowed for young people and teachers (re)story school and home and (re)story their relationships with each other. This was the transformation itself. Social poetics *and* designing with homelands mattered for building collective imaginaries of change at Sahasat.

Being in relation differently can have pedagogical, political, decolonial, and liberatory implications at local and global levels (Bang et al., 2015; Bang & Vossoughi, 2016; Corntassel, 2012; Freire, 2000; Gaztambide-Fernández, 2012; Rincón-Gallardo, 2019; Rose, 1989; Zavala, 2018). If colonization creates disconnection, separation, and dispossession, then Indigenous resurgence is about reconnection with ourselves, with others, with lands, cultures, and communities (Corntassel, 2012; Simpson, 2011). I suggest that designing with homelands with social poetics has implications in how we imagine, design, and enact learning systems that destabilize the educational hegemony through moment-to-moment ethical attunements. Even though this study is based in northern Thailand, this paper offers a way for that teachers, young people, and communities reclaim Indigenous education in other contexts as a site of ongoing strength and survivance (Villegas et al., 2008).

Chapter 6. CONCLUSION: TOWARDS STORYWORK

6.1 WRITING FROM PLACE

Just as I began, I am back in Chiang Rai, writing from the Kok river. Here, Indigenous education movements are alive and will continue. This dissertation makes visible some of the ways families, communities, young people and educators have always been building from within and across the knowledge systems of school and home. Yesterday was the first day of the cold season. The rice fields are cut just after a harvest and I see drying stacks of straw as I drive along the dusty roads and expanded highways. I am reminded that it is the stories with lands, and fellow humans that give my life meaning. We are our stories; stories inform who we are within our systems of relationships. In the four years that I have been working with Sahasat school in the capacity of a researcher, learning designer, storyteller/listener, tutor, learner, I have been able to reflect on the ways we have stayed the same and changed through designing together. I have been at almost every design meeting, running the sessions, brainstorming new ideas with teachers, observing classrooms, going back to Seattle and continuing to learn with Dr. Megan Bang and crew and sharing ideas back here, to then having other team members take over, having the teachers slowly organize and design the Tutoría work at Sahasat as they see fit. Sahasat, this land, is family.



Image 1. Writing from the Kok River in Chiang Rai, Dec 2, 2019

It has been over a year since we officially stopped working with Sahasat and the energy is still here, largely driven by Ajarn Fye and the teachers' leadership. Ajarn Witchai, just requested a copy of this dissertation in the school library. I am excited to see how the seeds planted here continue to grow. These are but the stories-so-far (Massey, 2005).

6.2 STORYWORK & TUTORÍA WITH LANDS

The stories in this dissertation broaden how being in relation differently can open up possibilities for sustaining, building, and advancing worlds that matter to us and our families. Across the three papers, we read, follow, enact different kinds of stories: oral stories, stories while walking with lands, stories in Tutoría dialogue, and the storywork practices of storytelling and storylistening as young people, teachers, and researchers. I foreground storywork in this dissertation as opening space for a multiplicity of stories matters for “reimagining and reconstructing local worlds” for the flourishing of multiple forms of life that are responsible and responsive to histories and dynamically changing lands and contexts (Escobar, 2018; Illich, 1973, p. 4).

The case of our work at Sahasat illustrates how stories can re-organize power and refuse singular narratives of our lives and our communities and who gets to tell them. It also illustrates the significance of storylistening as teachers and researchers if we are to move towards for just and equitable forms of teaching, learning, and research. Stories grow and guide our ethical sensibilities in our own lives, with lands and with each other (Archibald, 2008; Brayboy, 2006). Because anyone can tell and listen to stories, they are human’s original everyday technologies that foster heteroglossic, multi-voiced meaning-making (Bakhtin, 1984; Booker, 2019; Illich, 1973). For Indigenous communities, stories can protect and advance a community’s self-determination and radical interdependence in everyday ways. They are convivial tools that maximize self-determination through radical interdependence towards expanding “the degree to which society protects the power of individuals and of communities to choose their own styles of life through effective, small-scale renewal” Illich, 1973, p. 45). Stories are openings for political possibilities.

Sahasat’s case also examines how Tutoría was driven by the ethical, political, cultural and historical contexts and considerations of people and lands. Tutoría at Sahasat, especially with our iteration to design with homelands in Tutoría matters for reimagining and reorganizing school towards communities’ collective continuance (Whyte, 2014; 2017). What seemed to matter in Sahasat’s case was the relationship between Tutoría and Land. Tutoría creates the orientations, moment-to-moment practices, strategy, and structures across landscapes home and school. Similarly, Lands hold important family axiologies and Tutoría holds the reciprocal, dignifying relationships for sharing that knowledge on communities’ terms. In this way, teaching and learning in Tutoría through Lands was a kind of convivial reconstruction of school that made such small-

scale renewals possible at school. For example, small-scale renewals at the level of teacher and student (Article 3) created conditions for social poetic possibilities and mutual storytelling and storylistening (Archibald, 2008). Such poetics or poeisis – the felt struggles and co-creation of meaning within unfolding moments of interaction helped teachers to attune differently to the stories of young people, their families, and what was important and meaningful to them. These stories held grounded axiological and ethical sensibilities from within Indigenous families' lives and held possibilities for state-mandated expectations and structures to lose power. It was a beginning point for teachers to question global widespread narratives of modernity at school and work towards family and community futures instead (Mignolo, 2007; Shotter, 2010). Reorganizing classrooms for conviviality held openings for other forms of knowing and other forms of life so that family and community purposes began to gain power and resonance (Cámara, Castillo Macías, de Ávilas Aguilar, et al., 2018).

Another kind of small-scale renewal is the way teachers were in story with one another to generate collective and heterogeneous horizons of what we imagined to be possible at Sahasat. Teachers took up Tutoría in ways that felt meaningful and resonated with the nuanced contexts of their own histories and systems of relations. (Re)-storying relationships with students and families then, also was prefigurative (Yates, 2015). (Re)storying relationships at the level of student-teacher also seemed to have lateral implications for how teachers were collectivizing with each other. While never conclusive, being in story with one another seemed to be important contexts for social dreaming together so that school could become a place for heteroglossic generativity rather than increased control and dominance (Bang, 2009; Espinoza, 2008; Zavala, 2016).

Finally and perhaps most importantly, small-scale convivial renewals at Sahasat was physically embodied in going to walk and story homelands with families (Marin & Bang, 2018, See Article 2). For us at Sahasat, storylistening with families as visitors on their homelands was a starting point for schools to protect the power of communities to self-determine what is beautiful and important to sustain within their own worldviews, lands, and lifeways. While we only visited six villages (out of around 300), it seemed common that homelands were sites of important intellectual and ethical work. Storied lands provided initial possibilities to build heteroglossic worlds of school. For instance, family's grounded axiologies help us reimagine disciplinary forms of mathematics that hold teachings about how to be in good relation with lands and each other.

6.3 WE ARE OUR SYSTEMS OF RELATIONS: IMPLICATIONS FOR DESIGNING, TEACHING, AND SCALE

In closing, this dissertation offers implications for what we can do in the micro-moments in everyday ways in teaching and learning, how we think about curricular decisions and designs, and how to organize for continual convivial reconstruction within and across schools for Indigenous self-determination and radical interdependence at multiple scales. It is concerned with the interplay between global level systems & microlevel moments of interaction.

At a microlevel, dissertation makes visible the complex and dynamic lives of young people and teachers. First, it adds to current theory & practice in the learning sciences and in teacher education to consider the axiological dimensions in teacher education. First, how Tutoría apprentices teachers to see, listen to and treat young people, families, teachers within the complexity of their full lives, their multiple stories and relations seemed to matter for global change making. As a field, it would be important for teacher educators to understand and design with and build methodologies that understand power as it manifests and shifts within and across global, national, local levels and how to open up different possibilities, how to scale relationality & convivial forms of life (Booker, 2019; Illich, 1973). Second, Tutoría’s organization of a community of learners across pairs, classrooms, and schools creates “conditions for convivial work” where “structural arrangements that make possible the just distribution of unprecedented power” (Illich, 1973, p. 26). Built into Tutoría’s structure was a fractal, persistent, and ongoing convivial reconstruction of teacher-student, teacher-teacher, school-home relationships that mutually deepened each other. Axiological dimensions of teacher education include building teacher collectives through storywork (Article 1) at school. While I do not examine this in detail in this dissertation, it seems that being in qualitatively different relationships – the Tutoría dialogue in this case – required ethical work and practice across roles and how we were beginning to think about scaling relationality across scales, times, and place (Booker, 2019). How Tutoría was practiced, spread, and deepened was through being in it (Rincón-Gallardo, 2015, 2019). Storywork as a practice was deepened by being in story with one another.

The design and methodological implications of this dissertation are concerned with curricular designs with families and homelands. Article 3 on designing pathways home offers a potential way forward for deepening connections between schools and communities and ensuring

community-based knowledges are brought into school on the terms of Indigenous young people and their families (Ishimaru et al., 2019). Curricular designs connecting community knowledge are often wrought with tensions (Gutstein, 2012). For example, as I examine my own ways of seeing home and family life, my excitement to ask and “see” mathematics within home contexts easily reproduced extractivism- assimilative paradigms. While seeing mathematics or even coding for it is not bad in itself, it is important to not uphold mathematics as the single story of families and communities. We, our practices, and our knowledges exist within broader systems of relations. Furthermore, it was important that the Temas used in Article 3 were designed and taught by the young people and based in family stories, shared with consent and on their terms. Again, multiple stories and who tells them matters.

Finally, this dissertation offers implications for how we might live with stories. Being in story with each other helps us to uncover and understand children, teachers, and families in their fullness of selves and the complexity of their relations. We are important learning environments for each other. It is important to highlight that this dissertation suggests that more than just a theory, being a learning environment for the other means that we have ethical work to do as adults and teachers. It means making political shifts is dependent on our reciprocal willingness to be moved by each other in real and felt ways. We need to be willing to storylisten, to be witness thinkers, and to struggle with each other, and also hold each other through it.

The nature of power is ever-shifting, changing in forms and operating at multiple levels of activity (Esmonde & Booker, 2016). To move towards convivial reconstruction and radical interdependence (Escobar, 2018; Illich, 1973), we will need more dexterous, nimble methods to better see, name, and characterize how power, politics, and ethics play out across the landscapes of school and home (Esmonde & Booker, 2016). We more heteroglossic visions of how to design for and enact visions of critical conviviality and relationality.

This dissertation offers a way to see how everyday people were reaching for distinct ethics to overturn settler logics for communal ones, how they were holding space for localized land-based knowledges and stories that remind us that human people and land can be good for each other (Kimmerer, 2014). It shows how schools, instead of furthering colonialism, regimentation and exploitation, can also strengthen a community’s collective continuance – our moral *systems of relationships*, and support how communities who have always been building the pluriverse for the flourishing of diverse forms of life (Escobar, 2018).

BIBLIOGRAPHY

- Adichie, C. N. (2009). *The danger of a single story*. Retrieved from https://www.ted.com/talks/chimamanda_adichie_the_danger_of_a_single_story?language=en
- Aguirre, J., & Civil, M. (Eds.). (2016). Special Issue Mathematics Education: Through the Lens of Social Justice. *Mathematics through the Lens of Social Justice: Special Issue. Teaching for Excellence and Equity in Mathematics*, 7(1).
- Aguirre, J., & Zavala, M. del R. (2013). Making Culturally Responsive Mathematics Teaching Explicit: A Lesson Analysis Tool. *Pedagogies*, 163–190.
<https://doi.org/10.1080/1554480X.2013.768518>
- Aikenhead, G. (2018). Indigenous Perspectives in School Mathematics: From Intellect to Wisdom. In A. Kajander, J. Holm, & E. J. Chernoff (Eds.), *Teaching and Learning Secondary School Mathematics: Canadian Perspectives in an International Context* (pp. 39–49). https://doi.org/10.1007/978-3-319-92390-1_5
- Allen, C. (2012). *Trans-Indigenous*. Retrieved from <https://muse.jhu.edu/book/24795>
- Alton-Lee, A., Nuthall, G., & Patrick, J. (1993). Reframing classroom research: A lesson from the private world of children. *Harvard Educational Review*, 63(1), 50–83.
- Appadurai, A. (1996). *Modernity At Large: Cultural Dimensions of Globalization*. U of Minnesota Press.
- Archibald, J. "Q'um Q. X. (2008). *Indigenous Storywork: Educating the Heart, Mind, Body, and Spirit*. Vancouver: UBC Press.

- Archibald, J.-A., Lee-Morgan, J. B. J., & De Santolo, J. (Eds.). (2019). *Decolonizing Research: Indigenous Storywork as Methodology*. London, UK: Zed Books.
- Archibald, J.-A. Q. X., Nicol, C., & Yovanovich, J. (2019). Transformative education for Aboriginal mathematics learning: Indigenous storywork as methodology. In J.-A. Archibald, J. B. J. Lee-Morgan, & J. De Santolo (Eds.), *Decolonizing research: Indigenous storywork as methodology* (pp. 72–88). London, UK: Zed Books.
- Armstrong, J. (2007). *Native Perspectives on Sustainability: Jeannette Armstrong (Syilx) [Interview transcript]*. (D. E. Hall, Interviewer). Retrieved from Retrieved from the Native Perspectives on Sustainability project website: www.nativeperspectives.net
- Ascher, M. (1994). *Ethnomathematics: A Multicultural View of Mathematical Ideas* (1 edition). Boca Raton: Chapman and Hall/CRC.
- Asian Indigenous Peoples Pact. (2010). *Who we are: Indigenous Peoples in Asia—IWGIA - International Work Group for Indigenous Affairs*. Retrieved from https://www.iwgia.org/images/publications/0640_ho_are_e_IPs_in_Asia.pdf
- Baird, I. (2016). Indigeneity in Asia: An Emerging but Contested Concept. *Asian Ethnicity* 17(4): 201-205, 17(4), 501–505. <https://doi.org/10.1080/14631369.2016.1193804>
- Baker, D., Street, B., & Tomlin, A. (2003). Mathematics as Social: Understanding Relationships between Home and School Numeracy Practices. *For the Learning of Mathematics*, 23(3), 11–15. Retrieved from JSTOR.
- Bakhtin, M. (1984). *Problems of Dostoevsky's Poetics* (First edition edition). Minneapolis: Univ Of Minnesota Press.
- Bakhtin, M. M. (1981). *The Dialogic Imagination: Four Essays* (Reprint edition; M. Holquist, Ed.; C. Emerson, Trans.). Austin, Tex: University of Texas Press.

- Bang, M. (2009). Indigenous knowledge and education: Sites of struggle, strength, and survivance. *Science Education*, 93(5), 958–959. <https://doi.org/10.1002/sce.20351>
- Bang, M. (2015). Culture, learning, and development and the natural world: The influences of situative perspectives. *Educational Psychologist*, 50(3), 220–233.
- Bang, M., Curley, L., Kessel, A., Marin, A., Suzokovich III, E. S., & Strack, G. (2014). Muskrat theories, tobacco in the streets, and living Chicago as Indigenous land. *Environmental Education Research*, 20(1), 37–55.
- Bang, M. E. (2009). *Understanding students' epistemologies: Examining practice and meaning in community contexts* (Ph.D., Northwestern University). Retrieved from <https://search.proquest.com/docview/304973215/abstract/EDA52F4B60F14152PQ/1>
- Bang, M., Faber, L., Gurneau, J., Marin, A., & Soto, C. (2015). Community based design research: Learning across generations and strategic transformations of institutional relations toward axiological innovations. *Mind, Culture, and Activity*, 1–14.
- Bang, M., & Marin, A. (2015). Nature–culture constructs in science learning: Human/non-human agency and intentionality. *Journal of Research in Science Teaching*, 52(4), 530–544. <https://doi.org/10.1002/tea.21204>
- Bang, M., Marin, A., Faber, L., & Suzokovich, E. S. (2013). Repatriating Indigenous Technologies in an Urban Indian Community. *Urban Education*, 48(5), 705–733.
- Bang, M., & Medin, D. L. (2010). Cultural processes in science education: Supporting the navigation of multiple epistemologies. *Science Education*, 94(6), 1008–1026.
- Bang, M., Montaña Nolan, C., & McDaid-Morgan, N. (2018). Indigenous family engagement: Strong families, strong nations. In E. A. McKinley & L. T. Smith (Eds.), *Handbook of Indigenous Education*. Singapore: Springer Singapore.

- Bang, M., & Vossoughi, S. (2016). Participatory design research and educational justice: Studying learning and relations within social change making. *Cognition and Instruction*, 34(3), 173–193.
- Bang, M., Warren, B., Rosebery, A. S., & Medin, D. (2012). Desettling Expectations in Science Education. *Human Development*, 55, 302–318.
- Baquedano-López, P., Alexander, R. A., & Hernández, S. J. (2013). Equity issues in parental and community involvement in schools: What teacher educators need to know. *Review of Research in Education*, 37, 149–182.
- Barajas-López, F., & Bang, M. (2018a). Indigenous Making and Sharing: Claywork in an Indigenous STEAM Program. *Equity & Excellence in Education*, 51(1), 7–20.
<https://doi.org/10.1080/10665684.2018.1437847>
- Barajas-López, F., & Bang, M. (2018b). Towards Indigenous making and sharing: Implications for Mathematics Learning. In *Rehumanizing Mathematics for Students who are Black, Indigenous, and Latinx*. National Council of Teachers of Mathematics, Annual Perspectives in Mathematics Education.
- Barta, J., Brenner, M. E., & Frankenstein, M. (2009). Seeing with many eyes: Connections between anthropology and mathematics. In S. Mukhopadhyay, A. B. Powell, & S. Nelson-Barber (Eds.), *Culturally responsive mathematics education* (pp. 85–110). New York: Routledge.
- Battiste, M. (1986). Micmac literacy and cognitive imperialism. In J. Barman, Y. Hébert, & D. McCaskill (Eds.), *Indian education in Canada: The legacy: Vol. I* (pp. 23–44). Vancouver, Canada: University of British Columbia Press.

- Battiste, M. (1998). Enabling the autumn seed: Toward a decolonized approach to aboriginal knowledge, language, and education. *Canadian Journal of Native Education; Edmonton*, 22(1), 16–27.
- Battiste, M. (2002). *Indigenous knowledge and pedagogy in First Nations education: A literature review with recommendations*. National working group on education and the Minister of Indian affairs and Northern affairs Canada: Apamuwek Institute.
- Beach, K. (1995). Activity as a mediator of sociocultural change and individual development: The case of school-work transition in Nepal. *Mind, Culture, and Activity*, 2(4), 285–302. <https://doi.org/10.1080/10749039509524707>
- Behar, R. (1996). Chapter 1: The vulnerable observer. In *The vulnerable observer: Anthropology that breaks your heart* (pp. 1–33). Boston, MA: Beacon Press.
- Belcourt, C. (2018). The revolution has begun. In E. Tuck & K. W. Yang (Eds.), *Toward what justice? Describing diverse dreams of justice in education* (pp. 113–122). New York: Routledge.
- Bell, P., Tzou, C., Bricker, L., & Baines, A. D. (2013). Learning in diversities of structures of social practice: Accounting for how, why and where people learn science. *Human Development*, 55(5–6), 269–284.
- Booker, A. (2016). Ethical Commitments in Community-Based Research with Youth. *Mind, Culture, and Activity*, 23(1), 15–27. <https://doi.org/10.1080/10749039.2015.1107741>
- Booker, A., & Goldman, S. (2016). Participatory Design Research as a Practice for Systemic Repair: Doing Hand-in-Hand Math Research with Families. *Cognition and Instruction*, 34(3), 222–235. <https://doi.org/10.1080/07370008.2016.1179535>

- Booker, A. N. (2019, October). *Ethical power relations as an act of design*. Keynote presented at the Cyberlearning: The Cyberlearning 2019: Exploring Contradictions in Achieving Equitable Futures center for innovative research in cyberlearning, Alexandria, Virginia. Retrieved from <https://www.youtube.com/watch?v=RtjfXJrjBg4>
- Booker, A. N., Vossoughi, S., & Hooper, P. K. (2014). Tensions and possibilities for political work in the learning sciences. *Proceedings of International Conference of the Learning Sciences, ICLS*, 2(January), 919–926.
- Brayboy, B. J. M. (2005). Toward a tribal critical race theory in education. *The Urban Review*, 37(5).
- Brayboy, Bryan McKinley Jones. (2005). Toward a Tribal Critical Race Theory in Education. *Urban Review: Issues and Ideas in Public Education*, 37(5), 425–446.
<https://doi.org/10.1007/s11256-005-0018-y>
- Brayboy, Bryan McKinley Jones, & Castagno, A. E. (2009). Self-determination through self-education: Culturally responsive schooling for Indigenous students in the USA. *Teaching Education*, 20(1), 31–53.
- Brayboy, Bryan McKinley Jones, Gough, H. R., Leonard, B., Solyom, J. A., & Roehl, R. (2011). Reclaiming scholarship: Critical Indigenous research methodologies. In S. D. Lapan, M. T. Quartaroli, & F. J. Riemer (Eds.), *Qualitative research: An introduction to methods and designs* (pp. 423–450). San Francisco, CA: Jossey-Bass.
- Brayboy, Bryan Mckinley Jones, & Maughan, E. (2009). Indigenous Knowledges and the Story of the Bean. *Harvard Educational Review*, 79(1), 1–21.
<https://doi.org/10.17763/haer.79.1.10u6435086352229>

- Brock-Utne, B. (2000a). *Whose education for all?: Recolonization of the African mind*. New York: Falmer Press.
- Brock-Utne, B. (2000b). *Whose Education For All? : The Recolonization of the African Mind* (1 edition). New York: Routledge.
- Brown, A. L. (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *The Journal of the Learning Sciences*, 2(2), 141–178.
- Brown, A. L. (1997). Transforming Schools Into Communities of Thinking and Learning About Serious Matters. *American Psychologist*, 52(4), 399–413.
- Brown, A. L., & Campione, J. C. (1998). Designing a community of young learners: Theoretical and practical lessons. In N. M. Lambert & B. L. McCombs (Eds.), *How students learn: Reforming schools through learner-centered education* (pp. 153–186). Washington D.C.: American Psychological Association.
- Bruner, J. S. (1990). *Acts of Meaning*. Harvard University Press.
- Bryk, A. S., Sebring, P. B., Allensworth, E., Easton, J. Q., & Luppescu, S. (2010). *Organizing Schools for Improvement: Lessons from Chicago* (First Edition). Chicago ; London: University of Chicago Press.
- Buenrostro, P. M., & Radinsky, J. (2019). Looking at My (Real) World through Mathematics: Memories and Imaginaries of Math and Science Learning. *Cognition and Instruction*, 37(3), 390–407. <https://doi.org/10.1080/07370008.2019.1624546>
- Cajete, G. (1994). *Look to the Mountain: An Ecology of Indigenous Education*. First Edition. Retrieved from <https://eric.ed.gov/?id=ED375993>

- Cajete, G. (2008). Sites of strength in Indigenous research. In M. Villegas, S. R. Neugebauer, & K. R. Venegas (Eds.), *Indigenous knowledge and education: Sites of struggle, strength, and survivance* (pp. 204–207). Harvard Educational Review.
- Cámara, G. (1999). *Posprimaria comunitaria rural. El desafío de la relevancia, la pertinencia y la calidad*. Ciudad de México, México: CONAFE.
- Cámara, G. (2003). *Learning for life in Mexican rural communities: The Conafe post-primary centers*. Ciudad de México, México: CONAFE.
- Cámara, G., Castillo Macías, A., de Ávila Aguilar, Á., Espinosa, R. A. M., Morales Elox, J. M., & Salas Garza, E. (2018). *Tutoría y comunidades de aprendizaje en escuelas públicas multigrado (1997-2018)*. Retrieved from <https://redesdetutoria.com/download/tutoria-y-comunidades-de-aprendizaje-en-escuelas-publicas-multigrado-1997-2018-digital/>
- Cámara, G., Castillo Macías, A., de Ávila Aguilar, Á., Espinoza, R. A. M., Morales Elox, J. M., & Salas Garza, E. (2018). *Tutoría y comunidades de aprendizaje en escuelas públicas multigrado (1997- 2018)*. Ciudad de México, México.
- Carraher, T. N., Carraher, D. W., & Schliemann, A. D. (1985). Mathematics in the streets and in schools. *British Journal of Educational Psychology*, 3, 21–29.
- Chandraprasert, E. (1997). The impact of development on the Hilltribes of Thailand. In D. McCaskill & K. Kempe (Eds.), *Development or domestication? Indigenous peoples of Southeast Asia* (pp. 83–96). Chiang Mai, Thailand: Silkworm Books.
- Charoensuthipan, P. (2017). 64% of veggies “unsafe” due to pesticides. *Bangkok Post*. Retrieved from <https://www.bangkokpost.com/thailand/general/1366435/64-of-veggies-unsafe-due-to-pesticides>

- Civil, M. (2007). Building on Community Knowledge: An avenue to equity in Mathematics education. In Na'ilah S Nasir & P. Cobb (Eds.), *Improving Access to Mathematics: Diversity and Equity in the Classroom*.
- Civil, M., & Andrade, R. (2002). Transitions between Home and School Mathematics: Rays of Hope Amidst the Passing Clouds. In G. de Abreu & N. C. Presmeg (Eds.), *Transitions Between Contexts of Mathematical Practices* (pp. 149–169). https://doi.org/10.1007/0-306-47674-6_7
- Cole, M. (1989). Cultural psychology: A once and future discipline? In J. J. Berman (Ed.), *Nebraska symposium on motivation: Cross-cultural perspectives* (Vol. 37). Lincoln, NE: University of Nebraska Press.
- Cole, M. (1996). Creating model activity systems. In *Cultural psychology: A once and future discipline* (pp. 257–285). Cambridge, MA: Belknap Press.
- Cole, M. (2001). Sustaining model systems of educational activity: Designing for the long haul. In J. C. Campione, K. Metz, & A. S. Palinscar (Eds.), *Children's learning in laboratory and classroom contexts: Essays in honor of Ann Brown*. Retrieved from <http://lhc.ucsd.edu/People/MCole/ann.html>
- Cole, M. (2005). Using cross-cultural psychology to design afterschool educational activities in different cultural settings. In W. Friedmeier, P. Chakkarath, & B. Schwarz (Eds.), *Culture and human development: The importance of cross-cultural research for the social sciences* (pp. 53–71). New York, NY: Psychology Press.
- Cole, M. (2008). Cultural and cognitive development in phylogenetic, historical, and ontological perspective. In W. Damon & R. M. Lerner (Eds.), *Child and adolescent development: An advanced course* (pp. 593–646). New Jersey: John Wiley and Sons.

- Cole, M. (2012). Commentary on Conceptualizing Cultural and Racialized Process in Learning. *Human Development*, 55(5–6), 340–347. <https://doi.org/10.1159/000345325>
- Cole, M., & Griffin, P. (1983). A socio-historical approach to re-mediation. *Laboratory of Comparative Human Cognition*, 5(4), 69–74.
- Corntassel, J. (2012). Re-envisioning resurgence: Indigenous pathways to decolonization and sustainable self-determination. *Decolonization: Indigeneity, Education and Society*, 1(1), 86–101.
- Cuban, L. (1969). Teacher and community. *Harvard Educational Review*, 39(2), 253–272.
- D'Ambrosio, U. (2006). *Ethnomathematics*. Rotterdam: Sense Publishers.
- D'Ambrosio, Ubiratan. (1997). Where Does Ethnomathematics Stand Nowadays? *For the Learning of Mathematics*, 17(2), 13–17.
- D'Ambrosio, Ubiratan. (2009). A nonkilling mathematics? In J. E. Pim (Ed.), *Toward a Nonkilling Paradigm* (pp. 241–270). Center for Global Nonkilling.
- D'Ambrosio, Ubiratan. (2016). Ethnomathematics: A response to the changing role of Mathematics in society. In P. Ernest, B. Sriraman, & N. Ernest (Eds.), *Critical mathematics education: Theory, praxis, and reality* (pp. 23–34). Charlotte, NC: Information Age Publishing.
- Davis, J. (2013). *Survival Schools* (1 edition). Minneapolis, Minnesota: University of Minnesota Press.
- Deloria Jr., V., & Wildcat, D. R. (2001). *Power and Place: Indian Education in America* (First Printing, Underlining edition). Golden, Colo: Fulcrum Publishing.
- Deloria, V. (1999). *Spirit & Reason: The Vine Deloria, Jr., Reader*. Fulcrum Publishing.

- Diaz, V. M. (2011). Voyaging for Anti-Colonial Recovery: Austronesian Seafaring, Archipelagic Rethinking, and the Re-mapping of Indigeneity. *Pacific Asia Inquiry*, 2(1), 21–32.
- Eglash, R. (1999). *African Fractals: Modern computing and indigenous design*. New Brunswick: Rutgers University Press.
- Eglash, R. (2000). Anthropological perspectives on ethnomathematics. In H. Selin (Ed.), *Mathematics across cultures: The history of non-Western mathematics* (pp. 13–22). Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Eglash, R. (2007). *The fractals at the heart of African designs*. Retrieved from http://www.ted.com/talks/ron_eglash_on_african_fractals
- Eglash, R. (2009). Native-American analogues to the cartesian coordinate system. In S. Mukhopadhyay, A. B. Powell, & S. Nelson-Barber (Eds.), *Culturally responsive mathematics education* (pp. 281–293). New York: Routledge.
- Engeström, Y. (2011). From design experiments to formative interventions. *Theory & Psychology*, 21(5), 598–628.
- Engeström, Yrjö. (2001). Expansive learning at work: Toward an activity theoretical reconceptualization. *Journal of Education and Work*, 14(1), 133–156.
- Engeström, Yrjö, & Sannino, A. (2010). Studies of expansive learning: Foundations, findings and future challenges. *Educational Research Review*, 5, 1–24.
- Enyedy, N. (2003). Knowledge construction and collective practice: At the intersection of learning, talk, and social configurations in a computer-mediated mathematics classroom. *The Journal of Learning Sciences*, 12(3), 361–407.
- Enyedy, N., & Stevens, R. (2014). Analyzing Collaboration. In *The Cambridge Handbook of the Learning Sciences* (2nd ed.). Retrieved from <https://www-cambridge->

org.offcampus.lib.washington.edu/core/books/cambridge-handbook-of-the-learning-sciences/analyzing-collaboration/3CFB5AB7A3FC6E771D7499E2ECEFEFCE

Erickson, F. (2004). *Talk and Social Theory: Ecologies of Speaking and Listening in Everyday Life* (1 edition). Cambridge ; Malden, MA: Polity.

Errico, S. (2017). *The rights of indigenous peoples in Asia Human rights-based overview of national legal and policy frameworks against the backdrop of country strategies for development and poverty reduction* [Data set].

https://doi.org/10.1163/9789004322714_cclc_2017-0196-002

Escobar, A. (2004). Beyond the Third World: Imperial globality, global coloniality and anti-globalization social movements. *Third World Quarterly*, 25(1), 207–230.

Escobar, A. (2018). *Designs for the pluriverse: Radical interdependence, autonomy, and the making of worlds*. Retrieved from <https://doi.org/10.1215/9780822371816>

Esmonde, I., & Booker, A. N. (Eds.). (2016). *Power and Privilege in the Learning Sciences: Critical and Sociocultural Theories of Learning* (1 edition). New York: Routledge.

Espinoza, M. L. (2008). *Humanization and social dreaming: A case study of changing social relations in a summer migrant educational program* (University of California, Los Angeles). Retrieved from Available from ProQuest Dissertations & Theses Global.

(304654620). Retrieved from

<http://search.proquest.com.offcampus.lib.washington.edu/docview/304654620?accountid=14784>

Fernandes, R. (n.d.). *Roger Fernandes Introduction Video Storytelling Project*. Retrieved from

<http://www.indian-ed.org/resources/roger-fernandes-storytelling/>

- Frankenstein, M. (2005). Reading the world with math. In E Gutstein & B. Peterson (Eds.), *Rethinking Mathematics: Teaching social justice by the numbers* (pp. 19–28). Milwaukee, WI: Rethinking Schools.
- Freire, P. (1970). *Pedagogy of the oppressed*. New York City, NY: Continuum Publishing International Group.
- Freire, P. (2000). *Pedagogy of Freedom: Ethics, Democracy, and Civic Courage* (First Paperback Printing edition; P. Clarke, Trans.). Lanham: Rowman & Littlefield Publishers.
- Gadamer, H.-G. (2004). *Truth and Method* (Reprint edition). London: Bloomsbury Academic.
- Gay, G. (2000). *Culturally Responsive Teaching: Theory, Research, and Practice*. Teachers College Press.
- Gay, G. (2018). *Culturally Responsive Teaching: Theory, Research, and Practice* (3 edition). New York, NY: Teachers College Press.
- Gaztambide-Fernández, R. A. (2012). Decolonization and the pedagogy of solidarity. *Decolonization: Indigeneity, Education and Society*, 1(1), 41–67.
- Gerdes, P. (1994). Reflections on Ethnomathematics. *For the Learning of Mathematics*, 14(2), 19–22. Retrieved from JSTOR.
- Gerdes, P. (2011). African Basketry: Interweaving Art and Mathematics in Mozambique. *Bridges: Mathematics, Music, Art, Architecture, Culture*, 9–16.
- Ginsberg, M. B., & Craig, A. (2010). Tradition becomes the teacher: Community events enrich educators' professional learning. *Journal of Staff Development*, 31(4), 36–41.

- Goeman, M. (2008). From place to territories and back again: Centering storied land in the discussion of Indigenous nation-building. *International Journal of Critical Indigenous Studies*, 1(1), 23–34.
- Goffman, E. (1964). The Neglected Situation. *American Anthropologist*, 66(6 Part 2), 133–136. https://doi.org/10.1525/aa.1964.66.suppl_3.02a00090
- Goffman, E. (1983). The interaction order: American sociological association, 1982 Presidential address. *American Sociological Review*, 48(1), 1–17.
- Gonzalez, N., Moll, L. C., & Amanti, C. (2005). *Funds of Knowledge: Theorizing Practices in Households, Communities, and Classrooms*. Routledge.
- Goodman, J. (2013). The meritocracy myth: National exams and the depoliticization of Thai education. *SOJOURN: Journal of Social Issues in Southeast Asia*, 28(1), 101–131.
- Goodwin, C. (2000). Action and embodiment within situated human interaction. *Journal of Pragmatics*, 32, 1489–1522.
- Goodwin, C. (2013). The Co-Operative, Transformative Organization of Human Action and Knowledge. *Journal of Pragmatics: An Interdisciplinary Journal of Language Studies*, 46(1), 8–23.
- Goodwin, C. (2017). *Co-Operative Action*. New York, NY: Cambridge University Press.
- Gutiérrez, K.D., Baquedano-López, P., & Alvarez, H. (2001). Literacy as hybridity. In M. de la Luz Reyes & J. J. Halcón (Eds.), *The best for our children: Critical perspectives on literacy for Latino students* (pp. 122–141). New York, NY: Teachers College Press.
- Gutiérrez, K.D., & Orellana, M. (2006). The problem of English learners: Constructing genres of difference. *Researching in the Teaching of English*, 40, 502–507.

- Gutiérrez, K.D., & Rogoff, B. (2003). Cultural ways of learning: Individual traits or repertoires of practice. *Educational Researcher*, 32(5), 19–25.
- Gutiérrez, K.D., Rymes, B., & Larson, J. (1993). Script, counterscript, and underlife in the classroom: James Brown versus Brown v Board of Education. *Harvard Educational Review*, 63(3), 445–471.
- Gutiérrez, K.D., & Vossoughi, S. (2010). Lifting off the ground to return anew: Mediated praxis, transformative learning, and social design experiments. *Journal for Teacher Education*, 61(1–2), 100–117.
- Gutiérrez, Kris D. (2008). Developing a Sociocritical Literacy in the Third Space. *Reading Research Quarterly*, 43(2), 148–164. <https://doi.org/10.1598/RRQ.43.2.3>
- Gutiérrez, Kris D., & Jurow, S. A. (2016). Social design experiments: Toward equity by design. *Journal of the Learning Sciences*, 00, 1–34.
<https://doi.org/10.1080/10508406.2016.1204548>
- Gutiérrez, Kris D., Morales, P. Z., & Martínez, D. C. (2009). Re-mediating literacy: Culture, difference, and learning for students from nondominant communities. *Review of Research in Education*, 33(1), 212–245.
- Gutiérrez, R. (2007). (Re) Defining Equity: The Importance of a Critical Perspective. In Na'ilah Suad Nasir & P. Cobb (Eds.), *Improving Access to Mathematics: Diversity and Equity in the Classroom* (pp. 37–50). New York: Teachers College Press.
- Gutiérrez, Rochelle. (2017). Why Mathematics (Education) was Late to the Backlash Party: The Need for a Revolution. *Journal of Urban Mathematics Education*, 10(2). Retrieved from <http://ed-osprey.gsu.edu/ojs/index.php/JUME/article/view/347>

- Gutstein, Eric. (2009). The politics of mathematics education in the United States: Dominant and counter agendas. In *Culturally responsive mathematics education* (pp. 137–166). New York: Routledge.
- Gutstein, Eric. (2012). Connecting Community, Critical, and Classical Knowledge in Teaching Mathematics for Social Justice. In S. Mukhopadhyay & W.-M. Roth (Eds.), *Alternative Forms of Knowing (in) Mathematics: Celebrations of Diversity of Mathematical Practices* (pp. 300–311). https://doi.org/10.1007/978-94-6091-921-3_15
- Habermas, J. (1981). *The Theory of Communicative Action*. Beacon Press.
- Hall, R., & Stevens, R. (2015). Interaction analysis approaches to knowledge in use. In *Knowledge and interaction: A synthetic agenda for the learning sciences* (pp. 72–109). New York; London: Routledge.
- Harrison, R. V., & Jackson, P. A. (2010). *The ambiguous allure of the west: Traces of the colonial in Thailand*. Hong Kong: Hong Kong University Press.
- Heath, S. B. (1983). *Ways with Words: Language, Life And Work In Communities And Classrooms* (1st edition). Cambridge Cambridgeshire ; New York: Cambridge University Press.
- Hongladarom, K. (1999, July 4). *Competing discourses on Hill tribes: Media representation of ethnic minorities in Thailand*. Presented at the Presented at the 7th International Conference on Thai Studies, Amsterdam.
- Hyland, N. E., & Meacham, S. (2004). Community knowledge-centered teacher education: A paradigm for socially just educational transformation. In J. L. Kincheloe, S. R. Steinberg, & A. Burszty (Eds.), *Building a quality school of urban education* (pp. 113–134). New York, NY: Peter Lang.

- Hyun, S. (2014). Building a human border: The Thai border patrol police school project in the post-cold war era. *SOJURN: Journal of Social Issues in Southeast Asia*, 29(2), 323–363.
- Illich, I. (1971). *Deschooling society*. Retrieved from <http://philosophy.la.psu.edu/illich/deschool/>
- Illich, I. (1973). *Tools for conviviality*. New York City, NY: Harper & Row.
- Ingold, T. (2010). *Bringing Things Back to Life: Creative Entanglements in a World of Materials* [Working Paper]. Retrieved from Realities / Morgan Centre, University of Manchester website: <http://www.manchester.ac.uk/realities/publications/workingpapers/>
- IPM Info. (2016, December 1). How many people are poisoned by pesticides in Thailand? Retrieved October 11, 2019, from IPM info website: <https://ipm-info.org/many-people-poisoned-pesticides-thailand/>
- Ishimaru, A. (2014). When New Relationships Meet Old Narratives: The Journey Towards Improving Parent-School Relations in a District-Community Organizing Collaboration. *Teachers College Record*, 116(020307).
- Ishimaru, A. M., Bang, M., Valladares, M. R., Nolan, C. M., Tavares, H., Rajendra, A., & Chang, K. (2019). *Recasting Families and Communities as Co-Designers of Education in Tumultuous Times*. Retrieved from <https://nepc.colorado.edu/publication/family-leadership>
- Ishimaru, A. M., Torres, K. E., Salvador, J. E., Lott, J., Williams, D. M. C., & Tran, C. (2016). Reinforcing Deficit, Journeying Toward Equity: Cultural Brokering in Family Engagement Initiatives. *American Educational Research Journal*, 53(4), 850–882. <https://doi.org/10.3102/0002831216657178>

- Jackson, K. (2009). The social construction of youth and mathematics: The case of a fifth grade classroom. In Danny B Martin (Ed.), *Mathematics teaching, learning, and liberation in the lives of Black children* (pp. 175–199). New York: Routledge.
- Johnson, I. (2017, August 26). In Singapore, Chinese Dialects Revive After Decades of Restrictions. *The New York Times*. Retrieved from <https://www.nytimes.com/2017/08/26/world/asia/singapore-language-hokkien-mandarin.html>
- Jordan, B., & Henderson, A. (1995). Interaction analysis: Foundations and practice. *The Journal of Learning Sciences*, 4(1).
- Joseph, G. G. (1997). Foundations of Eurocentrism in mathematics. In A. B. Powell & M. Frankenstein (Eds.), *Ethnomathematics: Challenging Eurocentrism in mathematics education* (pp. 61–81). New York: State University of New York Press.
- Joseph, George Gheverghese. (2011). *The crest of the peacock: Non-European roots of mathematics* (Third Edition). Princeton, NJ: Princeton University Press.
- Jukping, S. (2008). *Mae khru khong chaat: A study of women teachers of Thai Hill tribe children* (Doctoral dissertation, University of Iowa). Retrieved from The University of Hong Kong Libraries.
- Kalman, J., & Solares, D. (2018). ‘Tear it out and rip it up or you might get charged again’: Paying debts at the company store in a farm workers’ camp in Mexico. In K. Yasukawa, A. Rogers, K. Jackson, & B. V. Street (Eds.), *Numeracy as Social Practice: Global and Local Perspectives* (pp. 59–75). New York & London: Routledge.

- Kampe, K. (1997). The culture of development in developing indigenous peoples. In D. McCaskill & K. Kempe (Eds.), *Development or domestication? Indigenous peoples of Southeast Asia* (pp. 132–182). Chiang Mai, Thailand: Silkworm Books.
- Katz, A. M., & Shotter, J. (1996). Hearing the patient's 'voice': Toward a social poetics in diagnostic interviews. *Social Science & Medicine*, *43*(6), 919–931.
[https://doi.org/10.1016/0277-9536\(95\)00442-4](https://doi.org/10.1016/0277-9536(95)00442-4)
- Kawagley, A. O. (1995). *A Yupiaq Worldview: A Pathway to Ecology and Spirit*. Waveland Press.
- Keyes, C. (2008). Ethnicity and the nation-states of Thailand and Vietnam. In P. Leepreecha, B. Kwanchewan, & D. McCaskill (Eds.), *Challenging the limits: Indigenous peoples of the Mekong region* (pp. 13–54). Chiang Mai, Thailand: Silkworm Books.
- Keyes, C. F. (1991). The proposed world of the school: Thai villagers entry into a bureaucratic state system. In C. F. Keyes, E. J. Keyes, & N. Donnelly (Eds.), *Reshaping local worlds: Rural education and cultural change in Southeast Asia* (pp. 87–138). New Haven: Yale University Southeast Asian Studies.
- Kielian-Gilbert, M. (1994). Of Poetics and Poiesis, Pleasure and Politics-Music Theory and Modes of the Feminine. *Perspectives of New Music*, *32*(1), 44–67.
<https://doi.org/10.2307/833151>
- Kimmerer, R. W. (2014). *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants* (First Paperback edition). Minneapolis, MN: Milkweed Editions.
- Klein, N., & Simpson, L. B. (2017, June 24). On extractivism: A conversation with Naomi Klein and Leanne Simpson of Idle No More. Retrieved June 2, 2019, from Rapid Shift website:
<http://www.rapidshift.net/on-extractivism/>

- Knijnik, G. (2002). Indigenous Knowledge and Ethnomathematics: Approach in the Brazilian Landless People Education. In *What is Indigenous Knowledge?: Voices from the Academy*. Routledge.
- Koerner, M. E., & Abdul-Tawwab, N. (2006). Using community as a resource for teacher education: A case study. *Equity and Excellence in Education*, 39(1), 37–46.
- Konsmo, E. M., & Recollect, K. (2019). Meeting the land(s) where they are at: A conversation between Erin Marie Konsmo (Métis) and Karyn Recollect (Urban Cree). In L. T. Smith, E. Tuck, & K. W. Yang (Eds.), *Indigenous and decolonizing studies in education: Mapping the long view* (pp. 238–251). New York: Routledge.
- Kovach, M. (2009). *Indigenous Methodologies: Characteristics, Conversations, and Contexts*. University of Toronto Press.
- Kwanchewan, B., & Prasit, L. (2009). Modern education systems and impact on ethnic minorities. In A. Baron-Gutty & S. Chupradit (Eds.), *Education, economy and identity: Ten years of educational reform in Thailand* (pp. 37–53). Chiang Mai, Thailand: IRASEC - Research Institute on Contemporary Southeast Asia.
- Ladson-Billings, G. (1995). Toward a Theory of Culturally Relevant Pedagogy. *American Educational Research Journal*, 32(3), 465–491.
<https://doi.org/10.3102/00028312032003465>
- Ladson-Billings, G. (1997). It doesn't add up: African-American students' mathematics achievement. *Journal for Research in Mathematics Education*, 28, 697–708.
- Laungaramsri, P. (2003). Ethnicity and the Politics of Ethnic Classification. In C. McKerras (Ed.), *Ethnicity in Asia* (pp. 157–173). London and New York: Routledge.

- Lave, J. (2011). Introduction: Apprenticeship and critical practice. In *Apprenticeship in critical ethnographic practice* (pp. 1–36). London: University Of Chicago Press.
- Lave, J., & Wenger, E. (1991). *Situated leaning: Legitimate peripheral participation*. New York, NY: Cambridge University Press.
- Leander, K. M., Phillips, N. C., & Taylor, K. H. (2010). The changing social spaces of learning: Mapping new mobilities. *Review of Research in Education*, 34, 329–394.
- Lee, C. D. (2001). Is October Brown Chinese? A cultural modeling activity system for underachieving students. *American Educational Research Journal*, 38(1), 97–141.
- Lee, C. D. (2002). Interrogating race and ethnicity as constructs in the examination of cultural processes in developmental research. *Human Development*, 45, 282–290.
- Lee, C. D. (2008). The Centrality of Culture to the Scientific Study of Learning and Development: How an Ecological Framework in Education Research Facilitates Civic Responsibility. *Educational Researcher*, 37(5), 267–279.
- Lee, C. D. (2012). Conceptualizing Cultural and Racialized Process in Learning. *Human Development*, 55(5–6), 348–355. <https://doi.org/10.1159/000345326>
- Lee, C. D. (2017). Understanding the Ecologies of Human Learning and the Challenge for Education Science. In N. Budwig, E. Turiel, & P. D. Zelazo (Eds.), *New perspectives on human development* (pp. 123–144). Cambridge University Press.
- Lemke, J. L. (2002). Ideology, intertextuality, and the communication of science. In P. H. Fries, M. Cummings, D. Lockwood, & W. Spruiell (Eds.), *Ideology, intertextuality, and the communication of science* (1 edition, pp. 32–55). London ; New York: Continuum.
- Levinas, E. (2005). *Humanism of the Other* (Reprint edition; N. Poller, Trans.). Urbana, Ill.: University of Illinois Press.

- Lipka, J., Andrew-Ihrke, D., & Yanez, E. E. (2011). Yup'ik Cosmology to School Mathematics: The Power of Symmetry and Proportional Measuring. *Interchange*, 42(2), 157.
<https://doi.org/10.1007/s10780-011-9153-4>
- Lipka, J., Hogan, M. P., Webster, J. P., Yanez, E., Adams, B., Clark, S., & Lacy, D. (2005). Math in a cultural context: Two case studies of a successful culturally based math project. *Anthropology & Education Quarterly*, 36(4), 367–385.
- Lloyd, B. C. including K., Suchet-Pearson, S., Wright, S., Burarrwanga, L., Ganambarr, R., Ganambarr-Stubbs, M., ... Maymuru, D. (2016). Morrku Mangawu—Knowledge on the Land: Mobilising Yolŋu Mathematics from Bawaka, North East Arnhem Land, to Reveal the Situatedness of All Knowledges. *Humanities*, 5(3), 61.
<https://doi.org/10.3390/h5030061>
- López Salmorán, D., & Rincón-Gallardo, S. (2003). *La capacitación artesanal y la profesionalización de la labor docente en Posprimaria*. México, D.F.: CONAFE.
- Marin, A., & Bang, M. (2018). “Look It, This is how You Know:” Family Forest Walks as a Context for Knowledge-Building About the Natural World. *Cognition and Instruction*, 36(2), 89–118. <https://doi.org/10.1080/07370008.2018.1429443>
- Marin, A., & Bang, M. E. (2015). Designing Pedagogies for Indigenous Science Education: Finding Our Way to Storywork. *Journal of American Indian Education*, 54(2), 29–51.
- Marin, A., Bang, M., Meixi, Halle-Erby, K., Booker, A., & McDaid-Morgan, N. (n.d.). Ethics and researcher learning. *Deepening Perceptions of Learning: Studying and Designing Ethical Practice with Researchers, Teachers, and Learners*. Presented at the International conference of the Learning Sciences, Nashville, TN.

- Marker, M. (2003). Indigenous voice, community, and epistemic violence: The ethnographer's "interests" and what "interests" the ethnographer. *International Journal of Qualitative Studies in Education*, 16(3), 361–375. <https://doi.org/10.1080/0951839032000086736>
- Marker, M. (2006). After the Makah Whale Hunt: Indigenous Knowledge and Limits to Multicultural Discourse. *Urban Education*, 41(5), 482–505. <https://doi.org/10.1177/0042085906291923>
- Martin, D. B. (2009). Researching race in mathematics education. *Teachers College Record*, 111(2), 295–338.
- Martin, Danny Bernard, Gholson, M. L., & Leonard, J. (2010). Mathematics as gatekeeper: Power and privilege in the production of knowledge. *Journal of Urban Mathematics Education*, 3(2), 12–24.
- Massey, D. (2005). *For space*. Thousand Oaks, California: Sage Publications Incorporated.
- McCaskill, D., Prasit, L., & Shaoying, H. (Eds.). (2008). *Living in a globalized world: Ethnic minorities in the Greater Mekong Subregion*. Chiang Mai, Thailand: Silkworm Books.
- McNabb, S. (1993). Tribal education in northern Thailand: Policy implications of current mobility patterns. *Asian Thought and Society: An International Review*, 18(52), 18–29.
- Meixi. (2012). *Tutorial relationships pedagogy and practice*.
- Meixi. (2016). Desdibujando los límites entre identidades personales y colectivas: La relación tutora en redes de comunidades de práctica para una transformación individual, colectiva y continua (Blurring the lines between personal and collective identities: Tutorial relationships in networked communities of practice for individual, collective, and continuous transformation). *Revista Didac*, 68, 27–35.

- Meixi, & Morales Elox, J. M. (2019). The Grassroots Move by Being in Relation: Ethics of Solidarity Through Teaching and Learning with Tutoría. *Critical Praxis: Paulo Freire SIG Journal*, (Spring 2019), 8–13.
- Meyer, H.-D., & Benavot, A. (2013). PISA and the globalization of educational governance: Some puzzles and problems. In *PISA, power and policy: The emergence of global educational governance* (pp. 7–26). Oxford, U.K.: Symposium Books.
- Mignolo, W. D. (2007). Delinking: The rhetoric of modernity, the logic of coloniality and the grammar of de-coloniality. *Globalization and De-Colonial Thinking, Special Issue of Cultural Studies*, 21(2–3).
- Mignolo, W. D., & Tlostanova, M. V. (2006). Theorizing from the Borders: Shifting to Geo- and Body-Politics of Knowledge. *European Journal of Social Theory*, 9(2), 205–221.
<https://doi.org/10.1177/1368431006063333>
- Million, D. (2008). Felt Theory. *American Quarterly*, 60(2), 267–272.
<https://doi.org/10.1353/aq.0.0005>
- Million, D. (2011). Intense Dreaming: Theories, Narratives, and Our Search for Home. *The American Indian Quarterly*, 35(3), 313–333.
- Million, D. (2014). There is a river in me: Theory from life. In A. Simpson & A. Smith (Eds.), *Theorizing Native studies* (pp. 31–42). Duke University Press.
- Moll, L. C. (2000). Inspired by Vygotsky: Ethnographic experiments in education. In C. D. Lee & P. Smagorinsky (Eds.), *Vygotskian perspectives on literacy research: Constructing meaning through collaborative inquiry*. Cambridge, UK: Cambridge University Press.

- Moll, L. C., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of Knowledge for Teaching: Using a Qualitative Approach to Connect Homes and Classrooms. *Theory Into Practice*, 31(2), 132–141. Retrieved from JSTOR.
- Moschkovich, J. N., & Nelson-Barber, S. (2009). What mathematics teachers need to know about culture and language. In S. Mukhopadhyay, A. B. Powell, & S. Nelson-Barber (Eds.), *Culturally responsive mathematics education* (pp. 111–136). New York: Routledge.
- Mukhopadhyay, S., Powell, A. B., & Frankenstein, M. (2009). An ethnomathematical perspective on culturally responsive mathematics education. In B. Greer, S. Mukhopadhyay, A. B. Powell, & S. Nelson-Barber (Eds.), *Culturally responsive mathematics education* (pp. 65–84). New York: Routledge.
- Mukhopadhyay, S., & Roth, W.-M. (2012). *ALTERNATIVE FORMS OF KNOWING (IN) MATHEMATICS: Celebrations of Diversity of Mathematical Practices*. Springer Science & Business Media.
- Nasir, Na'ilah Suad. (2002). Identity, goals, and learning: Mathematics in cultural practice. *Mathematical Thinking and Learning*, 4(2–3), 213–247.
- Nasir, Na'ilah Suad, & Hand, V. M. (2008). From the Court to the Classroom: Opportunities for Engagement, Learning, and Identity in Basketball and Classroom Mathematics. *Journal of the Learning Sciences*, 17, 143–179.
- Nasir, Na'ilah Suad, & McKinney de Royston, M. (2013). Power, Identity, and Mathematical Practices Outside and Inside School. *Journal for Research in Mathematics Education*, 44(1), 264–287. <https://doi.org/10.5951/jresematheduc.44.1.0264>

- Nasir, Na'ilah Suad, Rosebery, A. S., Warren, B., & Lee, C. D. (2006). Learning as a cultural process: Achieving equity through diversity. In K. Sawyer R. (Ed.), *The Cambridge Handbook of Learning Sciences* (1st edition, pp. 489–504). New York, NY: Cambridge University Press.
- Nasir, Na'ilah Suad, Rosebery, A. S., Warren, B., & Lee, C. D. (2014). Learning as a Cultural Process. In K. Sawyer R. (Ed.), *The Cambridge Handbook of the Learning Sciences* (2nd ed., pp. 171–190). Retrieved from doi:10.1017/CBO9781139519526.012
- Nelson, D. M. (2015). *Who Counts?: The Mathematics of Death and Life after Genocide* (Reprint edition). Durham: Duke University Press Books.
- Nelson-Barber, S., & Estrin, E. T. (1995). Bringing Native American Perspectives to Mathematics and Science Teaching. *Theory Into Practice*, 34(3), 174–185.
- Nespor, J. (1997). *Tangled Up in School*. Mahwah, N.J: Routledge.
- Nicol, C., Archibald, J. "Q'um Q. X., & Baker, J. (2010). *Investigating culturally responsive mathematics education*.
- Nikander, P. (2008). Working with Transcripts and Translated Data. *Qualitative Research in Psychology*, 5, 225–231. <https://doi.org/10.1080/14780880802314346>
- Núñez-Janes, M., Thornburg, A., & Booker, A. (2017). *Deep Stories: Practicing, Teaching, and Learning Anthropology With Digital Storytelling*. Warsaw, Berlin: Sciendo.
- Ochs, E. (1979). Transcription as theory. In A. Jaworski & N. Coupland (Eds.), *The Discourse Reader* (2nd Edition, pp. 166–178). London and New York: RoutledgeFalmer.
- Ochs, E., & Capps, L. (1996). Narrating the self. *Annual Review of Anthropology*, 25, 19–45.
- Ochs, E., & Capps, L. (2002). *Living Narrative: Creating Lives in Everyday Storytelling*. Cambridge, Mass.: Harvard University Press.

- Olson, K. (2009). *Wounded by school: Recapturing the joy in learning and standing up to old school culture*. New York: Teachers College Press.
- Owens, K., Paraides, P., Nutti, Y. J., Johansson, G., Bennet, M., Doolan, P., ... Taylor, P. (2011). Cultural horizons for mathematics. *Mathematics Education Research Journal*, 23(2), 253. <https://doi.org/10.1007/s13394-011-0014-3>
- Paine, L., & Zeichner, K. (2012). The local and global in reforming teaching and teacher education. *Comparative Education Review*, 56(4), 569–583.
- Palinscar, A. S., & Herrenkohl, R. (1999). Designing collaborative contexts. In A. M. O'Donnell & A. King (Eds.), *Cognitive Perspectives on Peer Learning* (pp. 165–175). Mahwah, NJ: Lawrence Erlbaum Associates.
- Paris, D. (2012). Culturally Sustaining Pedagogy: A Needed Change in Stance, Terminology, and Practice. *Educational Researcher*, 41(93), 93–97.
- Paris, D., & Alim, H. S. (2017). *Culturally Sustaining Pedagogies: Teaching and Learning for Justice in a Changing World*. New York: Teachers College Press.
- Pelletier, W. (1969). Childhood in an Indian village. *Two Articles*.
- Phillip, T., Bang, M., & Jackson, K. (2018). Articulating the “how,” the “for what,” the “for whom,” and the “with whom” in concert: A call to broaden the benchmarks of our scholarship. *Cognition and Instruction*, 36(2), 83–88.
- Powell, A. (2002). *Ethnomathematics and the challenges of racism in mathematics education*. (P. Valero & O. Skoymose, Eds.). Copenhagen.
- Prasit, L. (2019). Becoming Indigenous Peoples in Thailand. *Journal of Southeast Asian Studies*, 50(1), 32–50. <https://doi.org/10.1017/S0022463419000183>

- Prasit, L., McCaskill, D., & Kwanchewan, B. (Eds.). (2008). *Challenging the Limits: Indigenous Peoples of the Mekong Region*. Chiang Mai, Thailand: Silkworm Books.
- Prasit, L., & Meixi. (2018). Indigenous Educational Movements in Thailand. In E. McKinley & L. T. Smith (Eds.), *Handbook of Indigenous Education* (pp. 1–30).
https://doi.org/10.1007/978-981-10-1839-8_55-1
- Rincón-Gallardo, S. (2012). Grassroots educational change in Mexican public schools. *ReVista DIDAC, Harvard University Press*.
- Rincón-Gallardo, S. (2015). Bringing a counter-hegemonic pedagogy to scale in Mexican public schools. *Multidisciplinary Journal of Educational Research*, 5(1), 28–54.
- Rincón-Gallardo, S. (2019). *Liberating Learning* (1 edition). New York, NY: Routledge.
- Rincón-Gallardo, S., & Elmore, R. (2012). Transforming teaching and learning through social movement in Mexican public middle schools. *Harvard Educational Review*, 82(4), 471–490.
- Robertson, S. (2012). Placing teachers in global governance agendas. *Comparative Education Review*, 56(4), 584–607.
- Rogoff, B. (2003). Orientating Concepts. In *The cultural nature of human development* (pp. 3–36). Oxford UK & New York: Oxford University Press.
- Rogoff, Barbara. (1994). Developing understanding of the idea of communities of learners. *Mind, Culture, and Activity*, 1(4), 209–229.
- Rogoff, Barbara. (2003). *The Cultural Nature of Human Development* (Reprint edition). Oxford UK & New York: Oxford University Press.

- Rogoff, Barbara. (2014). Learning by Observing and Pitching In to Family and Community Endeavors: An Orientation. *Human Development*, 57(2–3), 69–81.
<https://doi.org/10.1159/000356757>
- Rogoff, Barbara, Paradise, R., Arauz, R. M., Correa-Chávez, M., & Angelillo, C. (2003). Firsthand learning through intent participation. *Annual Review of Psychology*, 54, 175–203.
- Rose, M. (1989). *Lives on the boundary: A moving account of the struggles and achievements of America's educationally underprepared*. Harmondsworth, Middlesex, England: Penguin Books Ltd.
- Rosebery, A. S., Ogonowski, M., DiSchino, M., & Warren, B. (2010). "The coat traps all your body heat": Heterogeneity as fundamental to learning. *Journal of the Learning Sciences*, 19, 322–357.
- Rymes, B., & Wortham, S. (2011). *Concepts and methods for using narratives in teacher education*.
- Santos, B. de S. (2014). *Epistemologies of the South: Justice Against Epistemicide* (1 edition). London New York: Routledge.
- Saxe, G.B., & Esmonde, I. (2005). Studying cognition in flux: A historical treatment of Fu in the shifting structure of Oksapmin mathematics. *Mind, Culture, and Activity*, 12(3 & 4), 171–225.
- Saxe, Geoffrey B. (1999). Cognition, development, and cultural practices. In E. Turiel (Ed.), *Development and cultural change: Reciprocal processes* (pp. 19–35). San Francisco, CA: Jossey-Bass.

- Saxe, Geoffrey B. (2014). *Cultural Development of Mathematical Ideas: Papua New Guinea Studies*. New York, NY: Cambridge University Press.
- Saxe, Geoffrey B., Gearhart, M., Shaughnessy, M., Earnest, D., Cremer, S., Sitabkhan, Y., ... Young, A. (2009). A methodological framework and empirical techniques for studying the travel of ideas in classroom communities. In B. Schwartz, T. Dreyfus, & R. Hershkowitz (Eds.), *Transformation of knowledge in classroom interaction*.
- Sengupta-Irving, T., & Enyedy, N. (2015). Why Engaging in Mathematical Practices May Explain Stronger Outcomes in Affect and Engagement: Comparing Student-Driven With Highly Guided Inquiry. *Journal of the Learning Sciences*, 24(4), 550–592.
<https://doi.org/10.1080/10508406.2014.928214>
- Sengupta-Irving, T., Redman, E., & Enyedy, N. (2013). Re-Storying Practice: Using Stories about Students to Advance Mathematics Education Reform. *Teaching and Teacher Education: An International Journal of Research and Studies*, 31, 1–12.
<https://doi.org/10.1016/j.tate.2012.10.007>
- Shaffer, D. W. (2017). *Quantitative Ethnography*. Madison, Wisconsin: Cathcart Press.
- Shaffer, D. W., Collier, W., & Ruis, A. R. (2016). A Tutorial on Epistemic Network Analysis: Analyzing the Structure of Connections in Cognitive, Social, and Interaction Data. *Journal of Learning Analytics*, 3(3), 9–45. <https://doi.org/10.18608/jla.2016.33.3>
- Shaffer, D. W., Hatfield, D., Svarovsky, G. N., Nash, P., Nulty, A., Bagley, E., ... Mislavy, R. (2009). Epistemic Network Analysis: A Prototype for 21st Century Assessment of Learning. *International Journal of Learning and Media*, 1(2), 33–53.
<https://doi.org/10.1162/ijlm.2009.0013>

- Shah, N., & Leonardo, Z. (2016). Learning discourses of race and mathematics in classroom interaction: A poststructural perspective. In I. Esmonde & A. N. Booker (Eds.), *Power and privilege in the learning sciences: Critical and Sociocultural Theories of Learning* (pp. 50–69). New York & London: Routledge.
- Shotter, J. (2005). *The short book of 'witness'-thinking*. Retrieved from <http://www.johnshotter.com/wp-content/uploads/2014/10/Shotter-Shortbook-of-Witness.pdf>
- Shotter, J. (2010). *Social Construction on the Edge: 'Witness'-Thinking and Embodiment*. Chagrin Falls, Ohio: The Taos Institute Publications.
- Simpson, L. (2011). *Dancing On Our Turtle's Back: Stories of Nishnaabeg Re-Creation, Resurgence, and a New Emergence*. Winnipeg: Arbeiter Ring Publishing.
- Simpson, L. B. (2014). Land as pedagogy: Nishnaabeg intelligence and rebellious transformation. *Decolonization: Indigeneity, Education & Society*, 3(3). Retrieved from <http://decolonization.org/index.php/des/article/download/22170>
- Simpson, L. B. (2017). *As We Have Always Done: Indigenous Freedom through Radical Resistance* (3rd ed. edition). Minneapolis: Univ Of Minnesota Press.
- Sizer, W. S. (2000). Traditional Mathematics in Pacific Cultures. In H. Selin (Ed.), *Mathematics Across Cultures: The History of Non-Western Mathematics* (pp. 253–287). https://doi.org/10.1007/978-94-011-4301-1_14
- Smith, G. H. (2002). Mai i te Maramatanga, ki te Putanga Mai o te Tahuritanga: From conscientization to transformation. *Educational Perspectives*, 37, 46–52.
- Smith, L. T. (2012). *Decolonizing Methodologies: Research and Indigenous Peoples* (2 edition). London: Zed Books.

- Street, B., Baker, D., & Tomlin, A. (2005). *Navigating Numeracies: Home/School Numeracy Practices*. Retrieved from <https://www.springer.com/gp/book/9781402036767>
- Styres, S. D. (2017). *Pathways for remembering and recognizing Indigenous thought in education: Philosophies of Iethi'nihsténha Ohwentsia'kékha (land)*. Toronto ; Buffalo ; London: University of Toronto Press.
- Tabulawa, R. (2003). International aid agencies, learner-centered pedagogy and political democratization: A critique. *Comparative Education, 39*(1), 7–26.
- Tallbear, K., & Willey, A. (2019). Critical Relationality: Queer, Indigenous, and Multispecies Belonging Beyond Settler Sex & Nature. *Imaginations: Journal of Cross-Cultural Image Studies, 10*(1). <https://doi.org/10.17742/IMAGE.CR.10.1.1>
- Tatto, M. T. (2006). Education reform and the global regulation of teachers' education, development, and work: A cross-cultural analysis. *International Journal of Educational Research, 45*, 231–241.
- Tatto, M. T., & Plank, D. (2007). The dynamics of global teaching reform. In *Reforming teaching globally* (pp. 267–276). Oxford, U.K.: Symposium Books.
- Taylor, E. V. (2009). The Purchasing Practice of Low-Income Students: The Relationship to Mathematical Development. *Journal of the Learning Sciences, 18*(3), 370–415. <https://doi.org/10.1080/10508400903013462>
- Taylor, K. H. (2017). Learning Along Lines: Locative Literacies for Reading and Writing the City. *Journal of the Learning Sciences, 26*(4), 1–42. <https://doi.org/10.1080/10508406.2017.1307198>
- Taylor, K. H., & Hall, R. (2013). Counter-mapping the neighborhood on bicycles: Mobilizing youth to reimagine the city. *Tech Know Learn, 18*, 65–93.

- Thaweessit, S., & Napaumporn, B. (2011). Integration of minorities in Thailand. In *Thailand migration report 2011—Migration for development in Thailand: Overview and tools for policymakers* (pp. 131–142). Bangkok, Thailand: International Organization for Migration.
- The Politics of Learning Writing Collective. (2017). The Learning Sciences in a New Era of U.S. Nationalism. *Cognition and Instruction*, 35(2), 91–102.
<https://doi.org/10.1080/07370008.2017.1282486>
- Thongchai, W. (1994). *Siam mapped: A history of the geo-body of a nation*. Honolulu: University of Hawaii Press.
- Thongchai, W. (2000a). The others within: Travel and ethno-spatial differentiation of Siamese subjects 1885-1910. In A. Turton (Ed.), *Civility and Savagery: Social Identity in Tai States* (1 edition, pp. 38–62). London: Curzon Press.
- Thongchai, W. (2000b). The Quest for “Siwilai”: A Geographical Discourse of Civilizational Thinking in the LateNineteenth and Early Twentieth-Century Siam. *The Journal of Asian Studies*, 59(3), 528–549.
- Tsing, A. L. (2005). *Friction: An Ethnography of Global Connection* (STU-Student edition). Retrieved from <http://www.jstor.org/stable/j.ctt7s1xk>
- Tuck, E. (2009). Suspending Damage: A Letter to Communities. *Harvard Educational Review*, 79(3), 409–428. <https://doi.org/10.17763/haer.79.3.n0016675661t3n15>
- Tuck, E., McKenzie, M., & McCoy, K. (2014). Land education: Indigenous, post-colonial, and decolonizing perspectives on place and environmental education research. *Environmental Education Research*, 20(1), 1–23. <https://doi.org/10.1080/13504622.2013.877708>

- Tuck, E., & Yang, K. W. (2012). Decolonization is not a metaphor. *Decolonization: Indigeneity, Education and Society*, 1(1), 1–40.
- Tzou, C., Meixi, Suárez, E., Bell, P., LaBonte, D., Starks, E., & Bang, M. (2019). Storywork in STEM-Art: Making, Materiality and Robotics within Everyday Acts of Indigenous Presence and Resurgence. *Cognition and Instruction*, 0(0), 1–21.
<https://doi.org/10.1080/07370008.2019.1624547>
- Vaddhanaphuti, C. (2005). The Thai state and ethnic minorities: From assimilation to selective integration. In K. Snitwongse & S. W. Thompson (Eds.), *Ethnic conflicts in Southeast Asia* (pp. 151–166). Singapore: Institute of Southeast Asian Studies.
- Vakil, S., Royston, M. M. de, Nasir, N. S., & Kirshner, B. (2016). Rethinking Race and Power in Design-Based Research: Reflections from the Field. *Cognition and Instruction*, 34(3), 194–209. <https://doi.org/10.1080/07370008.2016.1169817>
- van Nes, F., Abma, T., Jonsson, H., & Deeg, D. (2010). Language differences in qualitative research: Is meaning lost in translation? *European Journal of Ageing*, 7(4), 313–316.
<https://doi.org/10.1007/s10433-010-0168-y>
- Varenne, H., & McDermott, R. P. (1999). *Successful Failure: The School America Builds* (1 edition). Westview Press.
- Verran, H. (2000a). Accounting Mathematics in West Africa: Some Stories of Yoruba Number. In H. Selin (Ed.), *Mathematics Across Cultures: The History of Non-Western Mathematics* (pp. 345–371). https://doi.org/10.1007/978-94-011-4301-1_17
- Verran, H. (2000b). Logics and mathematics: Challenges arising in working across cultures. In H. Selin (Ed.), *Mathematics across cultures: The history of non-Western mathematics* (pp. 55–78). Dordrecht, The Netherlands: Kluwer Academic Publishers.

- Villegas, M. (2009). This Is How We “Role”: Moving Toward a Cosmogonic Paradigm in Alaska Native Education. *Canadian Journal of Native Education; Edmonton*, 32(1), 38-56,130.
- Villegas, M., Neugebauer, S. R., & Venegas, K. R. (Eds.). (2008). *Indigenous Knowledge and Education: Sites of Struggle, Strength, and Survivance*. Cambridge, MA: Harvard Educational Review.
- Vizenor, G. (2008). *Survivance: Narratives of Native Presence*. U of Nebraska Press.
- Vossoughi, S., & Booker, A. (2017). Transcultural Prefigurations: Reflections on Dynamic Relations between Local Movements and Social Movements. *Anthropology & Education Quarterly*, 48(3), 225–228. <https://doi.org/10.1111/aeq.12209>
- Vossoughi, S., & Gutiérrez, K. D. (2014). Studying movement, hybridity, and change: Toward a multi-sited sensibility for research on learning across contexts and borders. *National Society for the Study of Education*, 113(2), 603–632.
- Vossoughi, S., Jackson, A., Bang, M., Warren, B., & Rosebery, A. S. (2018). Attunements to the ethical. *Rethinking Learning in the Digital Age: Making the Learning Sciences Count*, 2, 1283–1289. London, UK: ISLS.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- wa Thiong’o, N. (2008). *Moving the Centre: The Struggle for Cultural Freedoms*. London : Portsmouth, N.H: James Currey.
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity* (1 edition). Cambridge, U.K.; New York, N.Y.: Cambridge University Press.

- Wertsch, J. V. (1991). *Voices of the Mind: Sociocultural Approach to Mediated Action*. Cambridge, Mass: Harvard University Press.
- Whyte, K. P. (2014). Indigenous Women, Climate Change Impacts, and Collective Action. *Hypatia*, 29(3), 599–616. <https://doi.org/10.1111/hypa.12089>
- Whyte, K. P. (2017). On concepts of collective continuance in Indigenous studies: Brief reflections concerning responsibility, fluidity and justice. *Littcrit: An Indian Response to Literature*, 43(2), 86–97.
- Whyte, K. P. (2018). Food sovereignty, justice, and indigenous peoples: An essay on settler colonialism and collective continuance. In A. Barnhill, T. Doggett, & A. Egan (Eds.), *Oxford Handbook of Food Ethics* (pp. 345–366). Oxford: Oxford University Press.
- Wilson, S. (2009). *Research is ceremony: Indigenous research methods*. Fernwood Publishing.
- Wortham, S. (2001a). A dialogic approach to discourse. In *Narratives in action: A strategy for research and analysis* (pp. 17–44). New York & London: Teachers College.
- Wortham, S. (2001b). Narrating the self. In *Narratives in action: A strategy for research and analysis* (pp. 1–14). New York & London: Teachers College.
- Yasukawa, K., Rogers, A., Jackson, K., & Street, B. V. (2018). *Numeracy as Social Practice: Global and Local Perspectives*. Routledge.
- Yates, L. (2015). Rethinking Prefiguration: Alternatives, Micropolitics and Goals in Social Movements. *Social Movement Studies*, 14(1), 1–21.
<https://doi.org/10.1080/14742837.2013.870883>
- Yin, R. K. (2013). *Case Study Research: Design and Methods*. SAGE Publications.
- Zaslavsky, C. (1999). *Africa Counts: Number and Pattern in African Cultures* (3rd edition). Chicago, Ill: Lawrence Hill Books.

Zavala, M. (2016). Design, Participation, and Social Change: What Design in Grassroots Spaces Can Teach Learning Scientists. *Cognition and Instruction*, 34(3), 236–249.

<https://doi.org/10.1080/07370008.2016.1169818>

Zavala, M. (2018). *Raza Struggle and the Movement for Ethnic Studies: Decolonial Pedagogies, Literacies, and Methodologies* (New edition). New York: Peter Lang Inc., International Academic Publishers.

Zeegers, M. (2011). Positioning the school in the landscape: Exploring Black history with a regional Australian primary school. *Discourse*, 32, 343–356.

<https://doi.org/10.1080/01596306.2011.573251>

Zeichner, K., & Bennett, D. (2015). *Engaging local communities in preparing the teachers of their children*. Presented at the AERA Annual Meeting, Chicago.

ARTICLE 1 APPENDIX A: DESIGN SESSIONS – FEBRUARY 2015 TO DECEMBER 2017

Key:

<i>Baseline data</i>
<i>Case study data of Indigenous Youth, Families and Teachers</i>
<i>Storywork event</i>

Year 1: Feb 2015 – Feb 2016

	Date	Type of Visit	Fieldnotes	Audio	Video	Interviews	Artifacts	Analyzed
1	Feb 19-20	Tutoría Launch Camp	√	√	√	√	√	√
2	Jul 7-8	Classroom work	√		√	√		√
3	Aug 22-24	Design team meetings (with teachers and students)	√	√				√
4	Sep 12	Tema curriculum design meetings (with teachers and students)		√				
5	Oct 26-27	Design team meetings (with teachers and students)						
6	Nov 24	Design team meetings (with teachers and students)						
7	Dec 18-19	Tema curriculum design meetings (with teachers and students)		√				√

8	Jan 18-19	Classroom work and individual teacher meetings						
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Year 2: Feb 2016 – Feb 2017

	Date	Type of Visit	Field notes	Audio	Video	Interviews	Artifacts	Analyzed
9	Mar 21-23	Tutoría Fiesta camp (Sahasat along with two other schools)	√	√	√	√	√	√
10	31-May	Design team meetings (teachers only)	√	√				
11	Jul 7-8	Design team meetings (teachers only)			√		√	√
12	Jul 12-15	Classroom work	√		√	√	√	√
13	Oct 3-4	Tutoría expansion camps (Expanding the tutoría network to new teachers, led by teachers)	√		√		√	
14	Nov 13-15	Classroom work	√		√		√	
15	Dec 9	Sahasat visit to another Tutoría school (Teachers taught by Students)	√		√		√	
16	Dec 19-22	Case study interviews of teachers and students and Classroom work	√		√	√	√	√

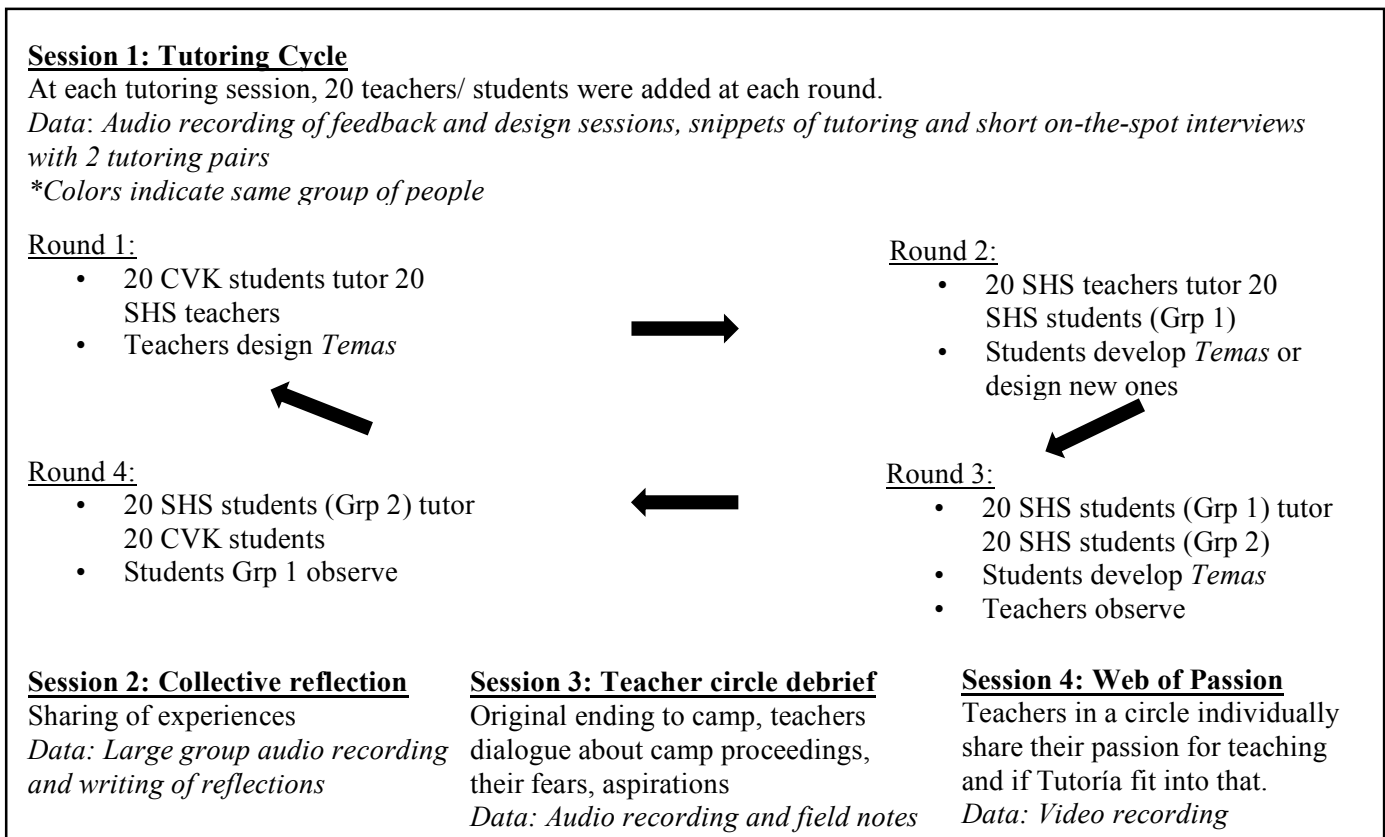
Year 3: Feb 2017 – Feb 2018

	Date	Type of Visit	Field notes	Audio	Video	Interviews	Artifacts	Analyzed
17	Feb 6-9	Tema curriculum design meetings (with teachers and students)	√		√		√	
18	Feb 6-9	Classroom work with case study teachers and students	√		√		√	
19	May 7 - 15	Home visits	√		√	√	√	√
20	May 11	Tutoría expansion camps (Expanding the tutoría network to new teachers, led by teachers)	√		√		√	
21	Aug 17-22	Tema curriculum design meetings with home practice (Case study Indigenous young people teaching teachers)	√		√	√	√	
22	Oct 5	Teacher expansion camp (Expanding the tutoría network to new teachers, led by teachers)			√		√	
23	Nov 7-9	Yuwapat at Sahasat			√		√	
24	Dec 18	Collective storying Tutoría Fiesta at Sahasat	√		√		√	

ARTICLE 1 APPENDIX B: STORYWORK EVENT I

- Session 1: Tutoring Cycle
 - Round 1: 20 Students at Chiang Rai Vittayakhom (CVK) tutor Sahasat (SHS) teachers and introduce them experientially to the Tutoría model and practice.
 - Round 2: 20 SHS teachers tutor 20 SHS students (Group 1). Both engage in reflection on both content and tutoring practice is done in pairs, then in community. SHS students' make modifications to the *Tema* they just learned.
 - Round 3: 20 SHS students (Group 1) tutors 20 SHS students (Group 2), reflection of tutoring done in pairs.
 - Round 4: 20 SHS students (Group 2) tutors initial 20 CVK students, reflection of tutoring done in pairs.
- Session 2: Collective reflection is done in community on *Tema* and tutoring practice.
- Session 3: Teacher Circle Debrief where teachers engaged in critical reflection of learning in the camp and if they wanted to take up this learning model.
- Session 4: Web of Passion with 20 SHS teachers where a web of relations was created among the teachers through a use of string artifact. Each teacher shared their purpose for being a teacher and if Tutoría fit into that vision.

Figure 6.1. Design of camp, Tutoría cycles and data collected



ARTICLE 1 APPENDIX C: TEACHER STORIES CODE BOOK

Teacher selected codes	Example
Student development	Tutoria is a way of giving knowledge that can develop students' capabilities.
Student learning	When the students have learned to be tutors and tutees, they have also learned to think critically and manage excellently. This knowledge that the students share will always be with them.
Teacher learning	After we talked and listened, then I was aware that it's not only about the content, but it was also about the students' interest. So, I changed from focusing on the academic one to be whatever that related to Math and related to daily life activity. The important moment is when I opened my heart to try tutoring leading students in order to have them tutor their friends.
Interest & Enjoyment	I have become a consultant for student tutors and keep suggesting them to tutor what they are good at and what they like. We must not force students or fix that you, this, that, those, but ask the students to choose.
Relationships	But after we sat together and had more relationship and after we talked together for a while, it seemed that we were conveying naturally. And when the students have spent time tutoring one another, this has led them to talk together, so the unity among the students has been generated. They help one another and they are happy to do any activity together.
Exchanges (Reciprocity)	Exchanging tutoring between classrooms might be another option and expand to tutoring other members in family and community. It can be started simply from what students are close to or know well. When students share the knowledge or the local wisdom (ethnic wisdom) with their friends, there is new knowledge to learn. This brings the benefits to not only students but also teachers when students can take the knowledge they have learned to bring more benefits.
Home knowledge	We have seen the potentials of the students to tutor about their ways of living from their home.
School knowledge	This was also hard because each of the student tutees had different academic backgrounds.
Emergent codes	Description/Example
Difference (Heteroglossia)	This helps me to know other views of other teachers and I gained more knowledge from different views that differ from mine. Each student has different abilities.
Possibility	I told them that it didn't have to be in the classroom that they use this. They could teach their younger brother or sister or anyone else in their dormitory or at home or when they have a chance, they can share.
Futurity	That moment was the time that led us to keep thinking further about what we are tutoring the students.

ARTICLE 2 APPENDIX A: FAMILY ETHNOGRAPHIC INTERVIEW

Tutoría Ethnographic Interview³⁵ Interviewer’s Guide April 13, 2017

This document is intended as a **guide** to be used by interviewers in conducting the Tutoría Ethnographic Interviews. It is not a “script.” Because ethnographic interviews are intended to be semi-structured and open-ended, the exact wording of the questions will change depending on the context. Furthermore, the questions below are not meant to “stand alone,” but rather to elicit responses that will be followed up on by the interviewer in order to explore the participant’s perspective further.

The questions are listed in the order that we would like topics to be introduced. However, you might find that a participant brings up a topic on his or her own before the scheduled point in the interview. For example, a participant might mention issues of gender or ethnicity before you have reached these topics in question 18. In this case, it is useful and perfectly appropriate to explore the topic when it is first introduced. (The later “slot” for that topic can then be used to address the topic further, if in your judgment there is more insight into the participant’s perspective to be gained from this.)

There is no scripted introduction to be used in the interviews with the 16 ethnographic participants³⁶ – we want you to adopt the style, phrasing, and tone that is most comfortable for you. In general, we would suggest that you first introduce, or re-introduce, yourself. Remind the participant that this is the yearly interview that he or she has agreed to participate in, and that the interview will last approximately 1 hour.³⁷ Tell the participant that you will be talking with them about a number of topics that are of interest for the Tutoría Study. These topics are about themselves and their experiences in and out of school. Stress that you’re interested in *their* ideas, opinions, and perspectives, and let them know that you appreciate whatever they’re able to tell you about the topics you’ll be exploring with them.

Please feel free to use your judgment to explore potential points of interest that might arise, whether or not they are included in the questions below. Sometimes the most important issues are those that aren’t anticipated by the researchers at the outset.

³⁵ Adapted from Academic Pathways Ethnographic Interview, May 7, 2004

³⁶ There will be a short “framing” introduction to be used with the 16 participants who will be participating in both the formal and the ethnographic interviews – this framing introduction will be distributed shortly.

³⁷ The ethnographic interview will last less than =2 hours with the 16 participants who will be participating in both the formal and the ethnographic interviews.

**Tutoria Study Ethnographic Interview - Family
Interviewer's Guide
April 13, 2017**

1. Let's start by talking a bit about your child's time in [present school].
 - a. How did you come to send your child to [school name - SHS school]?
NOTE: This is intended as a warm up question, just to get the interview underway, and can be followed up with a few other "small talk" questions, like "Where is that?" etc.
 - b. Is this your hometown/ home village? How long have you lived here? Who lives here?
Note: follow up and ask, How would you describe your family? What are some things you do when you go home? What do you enjoy doing when you are home?

2. Can you take me through a typical week for you here [Village Name]?

3. Let me ask you to think about the other families in this village. Would you say that in general they are more different from you or more similar?
 - a. *Explore further:* "How are they similar?" (or "How are they different?")

4. We work in Sahasat with the teachers and students in a way of teaching and learning called Tutoría to help improve the school. Have you heard about Tutoría before?
 - a. *If yes, explore further:* "What have you heard?"
If no, what have you heard about the learning at Sahasat?

5. How would you describe your child?
 - a. Would you say that in general they are more different from other children or more similar?

 - b. In what ways?

6. Since your child has attended school in Sahasat, have you noticed any change in them before going to school at Sahasat and after going to school?
 - a. *If yes, explore further:* "What have you noticed?" When did you first notice that? When do you notice this change? (e.g. when they are playing, when they are helping out in class, when they are studying?)
 - b. *If no, explore further:* Is there something that you would like to see your child grow in?

7. Specifically, have you noticed any change in your child the last year till now?

- a. *Prompt:* This can be about behavior, how they learn, or how they act or learn at home.
8. I'd like to ask about other learning experiences that and other academic experiences your child has had (at another school or outside of school).
- a. Has your child had academic experiences so far that you would describe as particularly good? Can you tell me about one of those? *If necessary, make sure to follow up with a question like: "So what was it that made that a good experience?"*
- b. Has your child had academic experiences that you would describe as particularly bad? Can you tell me about one of those? *Again, if necessary, make sure to follow up with a question like: "So what was it that made that a bad experience?"*
9. Are there things that you feel the school is doing now that they didn't do before?
Examples of this: They are communicating with us more, we now feel closer to the school
10. Since we started in Tutoría last year, do you feel that learning is different at school now?
a. *If yes, in what ways? If no, what would you like to see from the school? In what ways would you wish to change how learning happens at school?*
11. What can Sahasat do a better for your family?
a. What would you like your child to learn at Sahasat?
12. I'd like to ask you something about learning at home before and after working in Tutoría (since last year).
- a. Has Tutoría changed the way your child learns or participates at home or with your family? In what ways?
- b. Are there things that you can do now that you're a) child and b) family feels like they could not do before?
Examples of this would be working closer together as a family, to have their older children teach others in the village
13. Knowing what you know now, as you look back on the time that you were a student in school, is there anything that you would do differently or tell yourself, or what would you want your children to know about school?
14. One of the things that our research team is interested in is diversity, in terms of race, ethnicity, and gender. I'd like to ask you some questions related to this.
- a. Can you tell me how you identify yourself racially?
- b. What language do you speak at home?

- c. Are there supports or barriers, advantages or disadvantages, for you as a [ethnic identification] student?
 - i. How about for people of other racial or ethnic groups?
 - d. Do you think that there are differences between the schooling experiences of male and female students?
15. Let me ask you to think about the next years that your child will be spending at [School Name].
- a. What are you looking forward to in their time here?
 - b. What are you concerned about?
 - c. In what ways do you want them to grow as learner?
 - d. In what ways do you want them to grow as a person?
 - e. In what way do you want your family to grow?
16. Okay, let's imagine it's a few years from now.
- a. What do you imagine your family doing on a day-to-day basis?
 - b. Are there things about yourself/ your family that you need to work on to become a successful (xxx)?
17. If you could whisper in the ear of the teachers or leaders at school,
- a. what advice would you give them about improving things at school?
 - b. what advice would you give them about better improving things in your family/ community/ village?
18. Is there anything that I haven't asked you about that you think I should? Anything else that's relevant in an interview like this, do you think?
19. Do you have any questions you'd like to ask me?

การสัมภาษณ์ชาติพันธุ์การเรียนการสอนแบบปฏิสัมพันธ์ทิวทอเรีย¹

แนวทางสำหรับผู้สัมภาษณ์

วันที่ **13** เมษายน **2017**

เอกสารนี้ใช้สำหรับเป็นแนวทางให้ผู้สัมภาษณ์ใช้ประกอบการสัมภาษณ์ชาติพันธุ์การเรียนการสอนแบบปฏิสัมพันธ์ทิวทอเรีย ทั้งนี้เอกสารนี้ไม่ได้เป็นสคริปต์คำพูด เนื่องจากการสัมภาษณ์ชาติพันธุ์นี้ถูกออกแบบมาให้เป็นการสัมภาษณ์แบบกึ่งโครงสร้าง และเป็นคำถามปลายเปิด คำพูดจริงๆ ที่ใช้ในคำถามสามารถเปลี่ยนแปลงได้ทั้งนี้ขึ้นอยู่กับบริบท นอกจากนั้นคำถามต่างๆ ในเอกสารหน้าต่อๆ ไปนี้ไม่ได้หมายความว่า จะเพิ่มเติมอะไรเข้าไปไม่ได้ แต่สามารถที่จะปรับเปลี่ยนเพื่อตั้งคำถามที่ผู้สัมภาษณ์สามารถถามเพิ่มได้เพื่อสำรวจมุมมองของผู้ตอบ

คำถามถูกเรียงตามลำดับเพื่อนำเสนอเป็นหัวข้อ แต่อย่างไรก็ตามคุณอาจจะพบว่าผู้ตอบอาจจะกล่าวถึงหัวข้อหนึ่งก่อนคำถามที่ได้กำหนดไว้ในคำถามสัมภาษณ์ ยกตัวอย่างเช่น ผู้ตอบอาจจะกล่าวถึงประเด็นเรื่องเพศหรือชาติพันธุ์ก่อนที่คุณจะไปถึงประเด็นหัวข้อเหล่านี้ในคำถามที่ **18** ในกรณีนี้ก็ถือว่าเป็นประโยชน์และเหมาะสมที่จะศึกษาประเด็นนี้เมื่อถูกกล่าวถึงแต่แรก (ส่วนคำถามที่มีหัวข้อนั้นก็สามารถใช้พูดถึงหัวข้อนี้ได้ต่อไป ถ้าหากคุณเห็นว่าน่าจะมีมุมมองบางอย่างที่ผู้ตอบอาจจะพูดถึงหรืออธิบายได้มากกว่านั้น)

ไม่มีการพูดเกริ่นนำที่เป็นสคริปต์สำหรับการสัมภาษณ์ผู้ตอบด้านชาติพันธุ์ **16** คน² เราต้องการให้คุณใช้รูปแบบ หรือถ้อยคำ และน้ำเสียงที่คุณรู้สึกสบายๆ มากที่สุด โดยทั่วไป ก็อยากจะแนะนำให้คุณแนะนำตัวเอง หรือแนะนำตัวเองอีกครั้ง ย้ำให้ผู้ตอบทราบว่านี่คือการสัมภาษณ์ประจำปีที่เขายินดีที่จะเข้าร่วมตอบการสัมภาษณ์ และการสัมภาษณ์จะใช้เวลาทั้งหมดประมาณ **1 ชั่วโมง**³ บอกผู้ตอบว่าคุณจะพูดกับพวกเขาเกี่ยวกับหลายๆ เรื่องที่คุณสนใจสำหรับการเรียนการสอนแบบปฏิสัมพันธ์ทิวทอเรีย หัวข้อเรื่องต่างๆ ก็จะเกี่ยวข้องกับตัวผู้ตอบเองและประสบการณ์ของพวกเขาที่มีในโรงเรียนและนอกโรงเรียน เน้นว่าคุณสนใจในความคิด ความคิดเห็น และมุมมองของพวกเขา และบอกให้เขาทราบว่าเราเห็นคุณค่าทุกๆ อย่างที่พวกเขาสามารถที่จะบอกคุณได้เกี่ยวกับเรื่องต่างๆ ที่คุณจะพูดคุยกับพวกเขา

กรุณารู้สึกเป็นกันเองที่จะใช้วิจารณ์ของตนในการพูดคุยประเด็นที่น่าสนใจที่อาจจะถูกกล่าวขึ้นมา ไม่ว่าจะประเด็นเหล่านั้นจะมีอยู่ในคำถามในเอกสารชุดนี้หรือไม่ก็ตาม บางครั้งประเด็นที่สำคัญที่สุดคือประเด็นที่ผู้วิจัยคาดไม่ถึงในตอนแรก

¹ปรับจากการสัมภาษณ์ Academic Pathways Ethnographic Interview วันที่ 7 พฤษภาคม ค.ศ. 2004

² จะมีการแนะนำ "ที่เป็นกรอบ" สั้นๆ ที่ใช้กับผู้ตอบ **16** คน ซึ่งเข้าร่วมทั้งการสัมภาษณ์ที่เป็นทางการและการสัมภาษณ์ชาติพันธุ์ การแนะนำที่เป็นกรอบจะถูกแบ่งส่วนสั้นๆ

³ การสัมภาษณ์ชาติพันธุ์จะใช้เวลาน้อยกว่าหรือเท่ากับ **2 ชั่วโมง** กับผู้ตอบ **16** คน ซึ่งเข้าร่วมทั้งการสัมภาษณ์ที่เป็นทางการและการสัมภาษณ์ชาติพันธุ์ แนวทางสัมภาษณ์ชาติพันธุ์การเรียนการสอนแบบปฏิสัมพันธ์ทิวทอเรีย

วันที่ 13 เมษายน 2017

หน้า 2 จาก 6

การสัมภาษณ์ชาติพันธุ์การเรียนรู้การสอนแบบปฏิสัมพันธ์ทิวทอเรีย

แนวทางสำหรับผู้สัมภาษณ์

วันที่ 13 เมษายน 2017

ชื่อ:

ที่อยู่:

เบอร์โทรศัพท์:

1. เราจะมาพูดคุยกันเกี่ยวกับเรื่องที่ทำหมู่บ้านนี้นะคะ ก่อนอื่นมีใครอยู่ที่นี้บ้างคะ? ที่นี้ใช้บ้านเกิดของคุณพ่อคุณแม่หรือเปล่าคะ?
คุณพ่อคุณแม่อยู่ที่นี้มานานเท่าไรแล้วคะ?

2. พอจะเล่าถึงสิ่งที่ทำเป็นประจำในแต่ละสัปดาห์ให้ฟังหน่อยได้ไหมคะว่าทำอะไรที่นี้บ้าง?
หมายเหตุ: คอยติดตามและถามต่อ ขอให้บรรยายหน่อยกว่าครอบครัวของคุณพ่อคุณแม่เป็นอย่างไรบ้าง?

3. ต่อนะคะ ถ้างองคิดเกี่ยวกับครอบครัวอื่นๆในหมู่บ้านนี้ โดยทั่วไปคุณพ่อคุณแม่คิดว่าครอบครัวอื่นๆ แตกต่างจากครอบครัวเราหรือว่าก็เหมือนกับครอบครัวเราจะ?

ก. ถามต่อ: “เหมือนกันอย่างไรบ้างคะ?” (หรือ ต่างกันอย่างไรบ้างคะ?)

ข. What are their common activities in the village? (Could ask: How is the rice field laid out? How are the fishing nets made? How do you plan or make the bags? Weaving and patterns)

4. ขอคุณเล่าให้ฉันฟังเกี่ยวกับบ้านของคุณได้ไหม? ใครช่วยคุณสร้างบ้าน? สร้างบ้านยังไง?

5. Map: Favorite stories and map drawing.

เดี๋ยวดต่อไปก็จะเป็นการที่ขออนุญาตช่วย และก็ได้ช่วยคุยช่วยพ่อกับแม่ คือว่าในหมู่บ้านของเราเนี่ยจะอยากจะให้ขออนุญาตเนี่ยนะ อยากให้ขออนุญาตช่วยคุณครูวาดแผนที่ไหนนะคะ ในแผนที่ที่เป็นจุดที่เราคิดว่าเป็นสิ่งที่มีความสำคัญกับตัวเรา เช่น ที่ที่เราชอบ สถานที่ที่เราชอบ หรือว่าเป็นที่ที่เรามีความทรงจำที่ดีมีสิ่งที่เรารู้สึกว่ามันสำคัญกับเราในหมู่บ้านนี้อะเนอะ รวมถึงการที่ เออ มันเกี่ยวข้องกับครอบครัวเรา ชุมชนเรา ในความคิดขออนุญาตช่วยวาดเป็นแผนที่ให้ดูหน่อยได้ไหม

1. ก่อนสัมภาษณ์ (กับครอบครัว) การพูดคุยเกี่ยวกับครอบครัวผ่านแผนที่บันทึกวิดีโอ

- ก. สถานที่ที่หมู่บ้านที่ชอบที่สุดคือที่ไหนบ้าง?
- ข. มีอะไรที่อยากพาเราไปดูเพื่อที่จะเข้าใจครอบครัวและชุมชนของคุณ?
- ค. ความทรงจำหรือเรื่องราวที่สำคัญที่บ้านเป็นเรื่องอะไร?

2. นักเรียนและครอบครัววาดแผนที่ด้วยกัน

- ก. พูดคุยกับเราโดยใช้แผนที่ที่วาด

3. นักเรียนพาเราทัวร์ทั่วหมู่บ้านขณะที่นักเรียนและครอบครัวพูดเราก็อั้ววิดีโอไปด้วย ใช้ GPS เป็นเครื่องมือช่วยดูว่าเราเดินไปไหนบ้าง

ช่วงอธิบายแผนที่

Child (Sit-down) เริ่มต้นด้วยการพูดคุยนิตหน่อยเกี่ยวกับช่วงเวลาของลูกของคุณพ่อคุณแม่อยู่ใน (โรงเรียนปัจจุบัน)

6. คุณพ่อคุณแม่จะอธิบายลูกของตัวเองว่าอย่างไรบ้างคะ?

ก. โดยทั่วไปเช่น คุณพ่อคุณแม่คิดว่าลูกของเราแตกต่างจากเด็กๆ คนอื่น หรือเหมือนกับเด็กคนอื่นๆ ค่ะ?

ข. อย่างไรบ้างคะ?’

7. คุณพ่อคุณแม่ ทำไมถึงได้ตัดสินใจส่งลูกมาเรียนที่โรงเรียนสหศาสตร์ศึกษาคะ?

8. ตั้งแต่ที่ลูกได้เรียนที่โรงเรียนสหศาสตร์ฯ คุณพ่อคุณแม่สังเกตเห็นการเปลี่ยนแปลงในตัวเขาบ้างไหมคะ ถ้าเปรียบเทียบระหว่างก่อนและหลังจากไปเรียนที่สหศาสตร์แล้ว?

ก. ถ้าตอบว่า ใช่ ให้ถามต่อ: “สังเกตเห็นการเปลี่ยนแปลงอะไรบ้างคะ?” ครั้งแรกที่สังเกตเห็นคือเมื่อไรคะ? (เช่น ตอนที่พวกเขา กำลังเล่น หรือ ตอนที่พวกเขา กำลังช่วยเหลือสิ่งต่างๆ ในห้องเรียน หรือตอนที่พวกเขา กำลังศึกษาหาความรู้?)

ข. ถ้าตอบว่า ไม่ ให้ถามต่อ: มีอะไรบ้างไหมคะที่คุณพ่อคุณแม่อยากเห็นลูกเติบโตขึ้นในเรื่องอะไรบ้าง?

9. เขาเคยมีประสบการณ์การเรียนรู้อะไรบ้างไหม ที่ไม่ใช่เฉพาะที่เรียนในโรงเรียน

ในช่วงปิดเทอมไปเรียนเพิ่มเติมที่ ดงป่าเหมี้ยง โดยหลังจากที่ทำงานเสร็จก็ไปเรียน ผ่านการเรียนผ่านทีวี

ก. ประสบการณ์อะไรที่เขาเคยเรียนรู้มาเป็นประสบการณ์ที่ดีมากมีเรื่องบ้างคะ? ขอให้เล่าให้ฟังสักเรื่องได้ไหมคะ? ถ้าจำเป็นให้ถามต่อด้วยคำถาม เช่น อะไรที่ทำให้ประสบการณ์นั้นเป็นประสบการณ์ที่ดีคะ? (เช่น เคยเรียนทำมิดกับผู้ใหญ่ในหมู่บ้าน ดีมากเลยเพราะว่าทำมิดให้ผมเป็น และได้เรียนรู้กับกลุ่มใหญ่)

ข. แล้วประสบการณ์ที่ไม่ดีมีบ้างไหมคะ? ขอให้เล่าให้ฟังสักเรื่องได้ไหมคะ? ถ้าจำเป็นให้ถามต่อด้วยคำถาม เช่น อะไรที่ทำให้ประสบการณ์นั้นเป็นประสบการณ์ที่ไม่ดีคะ? (ที่โรงเรียนอื่น เช่น ลูกรู้สึกว่าคุณครูเป็นคนโง่)

10. พ่อแม่คิดว่าโรงเรียนทำอะไรดีขึ้นกว่าแต่ก่อนบ้าง ในมุมมองของครอบครัวเรานะคะ?

ยกตัวอย่างเช่น: ทางโรงเรียนติดต่อสื่อสารกับพวกเรามากขึ้น ตอนนี้เรารู้สึกใกล้ชิดสนิทสนมกับทางโรงเรียนมากขึ้น ตอนนี้โรงเรียนสหศาสตร์กำลังช่วยให้ลูกเป็นครู ซึ่งก่อนหน้านี้ไม่ได้ทำมาก่อน

ดีครับ ได้มาช่วยครอบครัวในการดูแลน้องให้มีความรู้ มีความรับผิดชอบ

11. พวกเราทำงานกับครูและนักเรียนที่โรงเรียนสหศาสตร์ ที่มีชื่อเรียกว่า“ทิวทอเรีย” คุณพ่อคุณแม่เคยได้ยินเกี่ยวกับทิวทอเรียมาก่อนไหมคะ หรือว่าเคยเล่าให้ฟังเกี่ยวกับทิวทอเรียบ้างไหมคะ?

ก. ถ้า เคย ให้ถามต่อว่า: “ได้ยินมาว่าอะไรบ้างคะ?”

ถ้า ไม่เคย ให้ถามต่อว่า แล้วได้ยินว่าที่โรงเรียนสหศาสตร์เขามีการเรียนอย่างไรบ้างคะ?

12. ขอลถามเป็นพิเศษนะคะว่า ตั้งแต่สิ้นปีที่แล้วจนถึงตอนนี้ คุณพ่อคุณแม่พอจะสังเกตเห็นการเปลี่ยนแปลงในตัวของคุณลูกของท่านบ้างไหมคะ? (เพราะว่าเป็นช่วงที่นักเรียนได้เรียนแบบทิวทอเรียคะ) เช่น อาจจะเป็นเกี่ยวกับพฤติกรรม วิธีการที่พวกเขาเรียนรู้ หรือ วิธีการแสดงออกหรือเรียนรู้ที่บ้าน

ก. ลูกมีส่วนร่วมที่บ้านหรือกับครอบครัวบ้างไหม? อย่งไรบ้าง?

ข. มีอะไรบ้างที่ตอนนี้ลูกหรือครอบครัวของท่านสามารถทำได้ ซึ่งก่อนหน้านี้ไม่สามารถทำได้ หรือไม่เคยทำมาก่อน

ยกตัวอย่างเช่น การทำงานร่วมกัน ใกล้ชิดกัน สนับสนุนกันแบบเป็นครอบครัวมากขึ้น หรือการที่ลูกคนโตได้สอนคนอื่นๆ ในหมู่บ้าน

ค. ตั้งแต่ที่เราได้เริ่มทิวทอเรียนมาเมื่อปีที่แล้ว คุณรู้สึกว่าการเรียนรู้ที่โรงเรียนแตกต่างไปบ้างไหมคะ?

ถ้าหากตอบว่า ใช่ ให้ถามต่อว่าเป็นอย่างไรบ้าง ถ้าตอบว่า ไม่ ให้ถามต่อว่าอยากเห็นการเรียนรู้แบบใดในโรงเรียน? คุณอยากจะเปลี่ยนการเรียนรู้ให้เกิดขึ้นในโรงเรียนอย่างไรบ้าง?

14. สำหรับครอบครัวของคุณแล้วคุณคิดว่าโรงเรียนสหศาสตร์น่าจะทำอะไรบ้างให้ดียิ่งขึ้นกว่านี้?

ก. คุณอยากให้ลูกของคุณได้เรียนรู้อะไรที่สหศาสตร์?

15. การรู้สิ่งที่คุณได้รู้อยู่ในตอนนี้ ขณะที่คุณมองย้อนกลับไปในเวลาที่คุณเคยเป็นนักเรียนในโรงเรียน มีอะไรบ้างใหม่ที่คุณอยากจะให้ทำแบบแตกต่างไปจากเดิม หรือมีอะไรที่คุณอยากจะบอกตัวเองใหม่ หรือมีอะไรบ้างใหม่ที่คุณต้องการให้ลูกของคุณรู้เกี่ยวกับโรงเรียน?

16. มีสิ่งหนึ่งที่มวิจยของเราสนใจนั่นก็คือความหลากหลายในด้านเชื้อชาติ ชาติพันธุ์และเพศ ก็เลยจะขอถามคำถามเกี่ยวกับเรื่องนี้คะ พอจะบอกเราหน่อยได้ไหมคะว่า ในทางเชื้อชาติหรือเผ่าพันธุ์ คุณมีเชื้อชาติหรือเผ่าพันธุ์ใดคะ?

ก. อยู่ที่บ้านคุณพูดภาษาอะไรคะ?

ค. มีอะไรที่เอื้อหรือเป็นอุปสรรค มีอะไรที่เป็นข้อดีหรือข้อเสีย สำหรับคุณบ้างไหมคะในฐานะที่เป็นคนชนเผ่า.....ในสังคม?

i. แล้วสำหรับคนที่มีเชื้อชาติหรือเผ่าพันธุ์อื่นๆ หรือชาติพันธุ์อื่นๆล่ะคะ?

ง. คุณคิดว่ามีความแตกต่างบ้างไหมระหว่างประสบการณ์การเข้าเรียนในโรงเรียนของนักเรียนชายและนักเรียนหญิง

17. ภายในสองสามปีข้างหน้าที่คุณจะใช้เวลาเรียนที่ (ชื่อโรงเรียน.....)

ก. รอคอยที่จะเห็นลูกของคุณเป็นอย่างไรเมื่อเขาเรียนอยู่ที่นั่น?

- ข. มีอะไรที่คุณรู้สึกกังวลไหม?
- ค. คุณอยากให้ลูกของคุณเติบโตขึ้นเป็นนักเรียนแบบไหนอย่างไรบ้าง?
- ง. คุณอยากให้ลูกของคุณเติบโตขึ้นเป็นคนแบบไหนอย่างไรบ้าง?
- จ. คุณอยากเห็นครอบครัวของคุณเติบโตขึ้นในลักษณะไหนอย่างไรบ้าง?
15. เอาล่ะ ตอนนี้ให้ลองจินตนาการถึงสองสามปีข้างหน้านับจากนี้
- ก. คุณจินตนาการว่าครอบครัวของคุณกำลังทำอะไรอยู่ในแต่ละวัน?
- ข. มีอะไรคะใหม่ที่ตัวคุณเองหรือครอบครัวของคุณต้องการที่จะทำเพื่อที่จะประสบความสำเร็จ?
16. ถ้าหากคุณสามารถกระซิบถึงหูคุณครูหรือคณะผู้บริหารโรงเรียนได้คุณอยากจะ
- ก. แนะนำอะไรบ้างเกี่ยวกับการพัฒนาสิ่งต่างๆ ในโรงเรียน?
- ข. แนะนำอะไรบ้างเกี่ยวกับการพัฒนาสิ่งต่างๆ ในครอบครัวของคุณ ชุมชนของคุณ และหมู่บ้านของคุณให้ดียิ่งขึ้น?
17. มีอะไรบ้างใหม่ที่พวกเราไม่ได้ถามคุณ แต่คุณคิดว่าพวกเราควรจะถาม ถามอะไรก็ได้ที่เกี่ยวข้องกับการสัมภาษณ์แบบนี้
18. แล้วคุณมีคำถามอะไรที่จะถามพวกเราบ้างไหมคะ?

ARTICLE 2 APPENDIX B: CODE BOOK FOR FAMILY WALKS

Name	Description	Example	Count
Dialogue flow (Aggregated)			137
Family initiated	Family initiates an statement, question or observation	<p>ครูสังเกตเห็นนะครับ รอบๆ หมู่บ้านจะมีสวนมะม่วงเต็มเลย You will observe around the village, that it is full of mango gardens.</p> <p>อันนี้สวนของน้องของยายค่ะ This is the garden of the younger sister of my grandma.</p>	40
Family answer	Family answer an outsider's question	<p>อ้อ เวลาปลูกเนอะของเรามี 8 ไร่เนอะ Oh, when we plant rice yeah, we have about 8 rai.</p>	31
Outsider followup	Outsider answers a question or	<p>อ้อ ต้องตัดอย่างนี้ด้วยหรือคะ? Ohh, we have to cut it like right or?</p>	25
Outsider prompts or link	When conversation is initiated by researcher	<p>และใครเป็นคนวัดระยะ ละคะ Who is the person to measure the stages?</p> <p>ธียาดา คุณยายจะเล่าอะไรให้ฟังอีกไหมคะ Mali, Grandma, what stories are you going to share here?</p>	41
Family practice (Aggregated)			335
Buying and selling	Anything to do with the price of the mango or people buying or selling	<p>คิดค่าไถที่เราต้องจ้างด้วยเนอะ We have to calculate the cost of hiring someone to plow the rice field.</p>	53
Eating	Eating relations, human and more-than-human	<p>ถ้าแก่จะหวาน พันธุ์นี้นะ When it's old (ripened), it will be sweet. This kind.</p>	11

Name	Description	Example	Count
		<p>ข้าวปีนี้เอาไว้กินเนอะ This year's rice we are keeping to eat.</p> <p>ปลากินผักนั่นๆ เยอะแยะเลย The fish eats the plants there, a lot a lot.</p>	
Embodiment	From video data, when speakers embody math or a more-than-human being.	ตุ้มต้าม ๆ นั่น It makes a sound Toom! Tam! (Embodying the sound of the fish)	6
Fertilizer/ Pesticide	Natural or chemical addition of substance to land	สำหรับผสมยา It's for mixing pesticides.	14
Growing	Growth of mango or rice, including what hampers or facilitates their growth	<p>ถ้าที่ออกแล้วนะ มีหน่วยแล้วนะ แตกหน่วยใหม่ If this has come out already, there's one bud already, to bud for new mangoes.</p> <p>แล้วเริ่มเขียวได้เมื่อไหร่คะ So when it (the rice) start becoming green?</p>	39
Harvesting	Picking or harvesting a plant or fruit.	แล้วอันนี้แม่จะรู้ได้ยังไงคะ ว่ามันแก่ไหม So this, mom how do you know when it is ready to be picked?	46
Kinds	Talking about a specific type or species of plant or animal	<p>เค้าเรียกพันธุ์อะไร What is this kind (of mango) called?</p> <p>คะ ปลานิน ปลาไน ปลาตะเพียน Yes, tilapia, carp, barb fish.</p>	24
Planting	Practice of putting seeds, saplings, or trees into the ground	เอาต้นกล้า มาเนอะ ต้นกล้ามาเป็นกำ Take the sapling and bring the sapling into a bundle (to plant)	33
Preparing	Preparing the seeds, lands, water for	ที่นี้พอน้ำเต็มเสร็จเขาก็ปักข้าว	10

Name	Description	Example	Count
	the land-based practice	Here, once the water is filled and ready, they plant the rice.	
Reading land	Noticings of land in place	ว่าไฉนจะลูก ตากแดดสีก็เลยเปลี่ยนใช้ใหม่ (พื๋นน้อยอธิบายให้อลิสันฟัง (This is still not ripe but this one has hit the sun, the color has changed.	57
Fish	Mention of fish	ยายอั้นนั้นปลาสาวย Grandma, that one is a catfish.	7
Mangoes	Talk around mango and associated practices	มี 500 ต้น กำลังเล็ก ๆ There are 500 tree here that are still small.	130
Math	Any mention of numbers, problem solving, measurements, patterns, figures, shapes	นี่ขนาดแค่กิโลละ 3 บาท This is just 3 baht per kilo. เชือก มีเชือกเอามาวัดเป็นระยะๆ 4 เมตร เหยอคะ Rope, there's a rope to measure 4m in distance	84
Extraction	Practices that remove relationship, taking without consent or reciprocity, calculates gain/profits with humans the sole benefit	ถ้าคำนวณก็พอได้กำไรอยู่ บ้างไหมคะ If you calculate, it is enough?	9
Gift	Giving land, giving to each other without expectation of return	ก่อนที่ไม่ได้ปลูกนี่ ที่นี้ พ่อแม่เขาให้เรา เขาให้เรา Before we couldn't plant here. His (her husband)'s mom and dad gave it to us. They came to give it to us.	13
Relations (Aggregate)			2 195
Day night relations	Relations with sun, moon, night or day time	กลางคืน หาแมงคืบ Come in the evening to look for insects	11
Family relations	Human family relations including cousins, grandparents, husband/wife relations, ancestors	ปู่มาอยู่ที่นี่ครับ เป็นรุ่นแรก Grandpa came to live here, he was the very first	44

Name	Description	Example	Count
Following land	Talk around following land e.g the contours of the land and also following the seasons, the rainy season of the land	ปุ๋ยเม็ดสีเทาๆเนอะ The fertilizer once it's done it becomes gray	22
Machines and technology	Questions or talk around the use of tools, technologies or machines for harvesting, buying etc	ใช้รถเกี่ยวไปขายอะคะ We use a car to sell it.	5
Outsiders	Mention of outsiders to village and relations to them, also how to behave with outsiders	ขายมะม่วง อันนี้เค้าแกมาซื้อมะม่วง Selling mangoes, this, the boss comes to buy mangoes	41
Seasons	Rice seasons, planting seasons, weather seasons – wet season, hot season, and cold season	ซึ่งน้องก็รู้หมดว่าอันไหนเป็น นาปัง นาปี นาปังนี้ เดือน มกราคม , กุมภาพันธ์อะ They also know everything about which one is Na Pang and Na Pi (rice seasons). Na Pang is in January and February.	17
Village Organization	Village meetings, how the villages are set up	แบบเรียกกันพัฒนาหมู่บ้านอย่างนี้ครับ They call each other to come help develop the village, like this.	24
Water	Attention to water relations (rain, ponds, human sources, underground water)	เจาะบาดาลแล้วก็ขุดขึ้นมา We drill into the groundwater and then dig up.	17
Wind	Wind relations, and noticing them in land	ลมมาแล้วก็มากระทบกันเอง ไซ้ไหม? The wind comes and then come a hit each other right?	8
Rice	Talk involving rice	ปลูกข้าวเป็นคะ ปลูกข้าวได้ They are able plant rice, they can plant rice.	122
School	Talk around school experiences, school in village, school connections	อันนี้เป็นของมัธยมครับ อนุบาลถึง ม 3 This is a school from kindergarten to Secondary 3 (Grade 8).	19

Name	Description	Example	Count
		ตอนที่เรากลับจากโรงเรียนมาแล้ว เลิกเรียน 3 โมงเราก็มาปลูกเกี่ยว/ When the school is over we will come here at 3 pm to reap the rice.	
Story	Telling of events or practices that families usually do or have experienced	ไปดูที่สวนที่หาแมงหน สวนที่เก็บแมงหนะ He goes to the garden to find insects, to the garden to collect them.	28
Time (Aggregated)	Times and toggling, these codes often overlapped.	อันนี้รุ่น 3 รุ่น 3 อันนี้ This is the third generation (of mangoes)	93
Future	Future speak, e.g. next time	ถ้าครูอยากไปเที่ยวน้ำตก ก็กลับมา เตียวให้ลูกชายพาไปอีกที่ มีน้ำตก If teachers want to go visit a waterfall, come back and then my son will bring you to another place that has a waterfall.	34
Past	Talk about events or places in the past	แต่ก่อนเป็นบ้านของม่อน หม่อน But before, this used to be my great grandparent's house	32
Present	Today or describing things now as they are	วันนี้ ชื้อต้นไม้ 800 ต้น Today we bought 800 more trees.	27

ARTICLE 3 APPENDIX A: TUTORIA TEACHERS & STUDENTS AT SAHASAT

	Name	Teaches Grade	Years teaching	Ethnicity/Tribe	Subject
1	Noom	P4 (Grade 4)	5 – 10 years	Karen	English
2	Yai	P6 (Grade 6)	> 20 years	Lanna Thai	Thai
3	Ant	P6 (Grade 6)	5- 10 years	Lanna Thai	Mathematics
4	Jan	P6 (Grade 6)	10 – 15 years	Karen	English
5	Dim (Retired)	M1 (Grade 7)	> 20 years	Lanna Thai	Thai
6	Nong	M2 (Grade 8)	> 20 years	Lanna Thai	Health
7	Surang	M3 (Grade 9)	> 20 years	Lanna Thai	Social studies
8	Tep	M3 (Grade 9)	5 – 10 years	Lahu	Social studies
9	Pitch	M3 (Grade 9)	5 – 10 years	Lanna Thai	Social studies
10	Sasi	M3 (Grade 9)	5 – 10 years	Lanna Thai	English
11	Ganjana	M5 (Grade 11)	5 – 10 years	Lanna Thai	Mathematics
12	Gon	M5 (Grade 11)	5 – 10 years	Akha	English
13	Chuti	M5 (Grade 11)	5 – 10 years	Lanna Thai	Thai
14	Ann	M4, 5 (Grade 10, 11)	10 – 15 years	Lanna Thai	Chemistry & Health
15	Poom	M5 (Grade 11)	5 – 10 years	Lanna Thai	English
16	Beam	M4, 5 (Grade 10, 11)	5 – 10 years	Lanna Thai	Social studies
17	Im	M5 (Grade 11)	5 – 10 years	Lanna Thai	Mathematics
18	Bunrung	M5, 6 (Grade 11, 12)	15 – 20 years	Isarn Thai	Biology
19	Pear	Mix ages	15 – 20 years	Karen	Special education
20	Noon	Academic Head	NA	Karen	

Case Study teachers

Table: Case study participants – Students & Their Families

Name	Grade	Tribe	Home practice	Data Collected
Ti	M5 (Grade 11)	Hmong	Dying clothes in Hmong culture	<ul style="list-style-type: none"> • Entrance interview • Home visit with family interview • Design session • Design session post-interview
Fa	M5 (Grade 11)	Akha	Making tea out of coffee husks	
Chompu	M3 (Grade 9)	Karen	Volleyball	
San	M1 (Grade 7)	Akha	Traditional tribal games	
Arm	M1 (Grade 7)	Akha	Trap fishing	
Mali	M1 (Grade 7)	Lanna ³⁸ Thai	Planting and harvesting rice	

³⁸ Lanna Thai: Northern Thai; Isarn Thai: Northeastern Thai

