Connecting with Swirls through Autoethnography: Perspectives on STEM Education as an Assimilated Quapaw

By

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Abstract

The purpose of this autoethnography is to explore my own lived experiences as a Quapaw who was adopted out at an early age, and to better understand my perspectives on STEM (Science Technology Engineering Math) education as an assimilated Quapaw. This autoethnography explores my previous educational experiences and my journey through different research efforts to deepening the understanding of Indigenous peoples and STEM Education. This study stresses the importance of stories as data for research, and how stories are explored, described, connected, interpreted, and shared. This process is nonlinear. Aligning myself as an Indigenous Researcher (Whitinui, 2014; Bishop, 2020) has helped to clarify my approach to doing research. Through the use of Tribal Critical Race Theory (Brayboy, 2005) and The Transformational Indigenous Praxis (Pewewardy, 2017), this autoethnography has brought to light the importance of connections and the impact of a lack of connections. Connections are important, but how I learned to view those connections was found to be equally important. The term connecting, while at times seems linear, can also be observed within swirls. Swirls connect in nature, like galaxies and storms, but can be approached as a lens to view connections in research. All efforts made in education, research and personal life needs to come back around to a question of how it connects me and my family to Quapaw. Recentering my spaces to connect with Indigenous ways means going back to the swirl, going back to revisit a space, and then taking the swirl to build connections. This is healing, this is *ki ho ta*. Not abandoning one thing for another but swirling them together to keep both. The impact on STEM is to broaden the perspective of traditional teaching methods to incorporate nonlinear and Indigenous perspectives. The Indigenous communities and the Western education models are not the same, but we can bring them together, swirl them into our understanding, but the parts are still different.

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Preface

This dissertation began as a look into the tensions that Native American students, as Indigenous peoples, may have with traditional Western methods of learning science. As a science teacher, I wanted to know more about what "turns off" certain students to science, specifically Indigenous peoples. As a citizen of the Quapaw (Ogahpah) Nation who was adopted out at an early age, I wanted to focus specifically on Indigenous peoples and their relationship to science education. Native American students seemed like a good place to focus. I was encouraged by my faculty advisors, a few friends that were also citizens of Native nations, and some friends that had experiences with Indigenous communities. I grew up off the reservation and was actively learning more about my Quapaw community and being a citizen of that nation. It seemed like a perfect fit for a dissertation.

My original research proposal was to interview Indigenous undergraduates at the University of Kansas and later at Haskell Indian Nations University if necessary. I already knew and had the support of the person that headed the Indigenous student organization at KU, known as the First Nations Student Association. Setting up a time to speak to the group would be easy. Everyone I talked with about the research felt that getting a few students to agree to interviews should not be difficult.

The research idea was to conduct several in-depth interviews. The sample would come from different Native nations with different customs, beliefs and worldviews. I only wanted a few interviews that I could use, along with my own experiences, to study feelings among students that were not represented in the literature of the time. So, I set out to get a few interviews and defend the notion that stories from Indigenous peoples are knowledge and therefore acceptable data. More than that, I wanted to add to a larger story, and create counter

stories to help us deepen our understanding of Indigenous students in Science, Technology, Engineering and Mathematics (STEM) fields.

Some hurdles were obvious from the start. I do not look like a stereotypical Native. I pass for White. My family has kept its ties with the Quapaw Nation, and I have been a registered member of the tribe my whole life. I have also passed as White my whole life. When I tell people I am Native American, I am sure they think I mean that I have some mysterious and unverified Native ancestry. That misconception about ancestry is a tricky part of being Quapaw that I have known for a long time. It works both ways, as not all Indigenous peoples believe that tribal affiliation is enough, and there are sociocultural layers to being an insider that go beyond carrying an official ID card. Regardless, I would have to say it hurts more when I am told I am not Native by another Native than it is when I am told this by a non-Native. My first hurdle was to figure out how to get interviews when I felt I did not look the part. Or maybe, it is more about my connectedness to the Quapaw community, my comfort and sense of belonging in intertribal social contexts, and how the history of settler colonialism brought me to this point – a mostly assimilated Quapaw adopted away from the community, grabbing hold of the few connections I have remaining. Assimilation and disconnect with the tribe were by design, but my view of assimilation and disconnect was limited, just like the tip of an iceberg. And like icebergs, what I could not yet see was vast.

The rest of the hurdles in my research were unknown to me at the time and eventually made the research more difficult than expected. I found myself woefully unprepared. In the beginning I met other Indigenous educators in science who also wondered why Indigenous peoples were underrepresented in STEM. Everyone I talked to liked what I was doing and

encouraged me to go on. But I had not talked to everyone. As a matter of fact, I had not talked to many students at all. A wall was showing itself in front of me – a disconnect.

I spent a couple of years meeting with different Indigenous individuals that were educators and also engaged in science. I went to workshops put on by Native educators and attended lectures by Indigenous scientists. I became invested, but nothing led to more interviews, the data I needed. I then decided to approach Haskell Indian Nations University for approval to interview their student body. Haskell denied my request. I knew I had hit rock bottom and realized my path was misguided. But it would take another year to begin to realize why. My journey can be complicated, and that is a key reason for shifting to autoethnography. Bishop (2020) suggests that "Indigenous autoethnographies strive to increase complexity" (p. 2), and my stories do just that, as they offer up the perspective of someone who was adopted out of a specific community and experienced assimilation and the ongoing processes of settler-colonialism. My stories, at least in part, are shared by many others, and they work to add extra layers of complexity to the concept of being Indigenous, or Quapaw, in the context of navigating every level of our educational systems. These are Indigenous stories, albeit my unique version of that existence, and I am employing autoethnography as a way to make these stories visible. In a way, due to my experiences of assimilation through educational systems, I even have hesitations about calling this work Indigenous autoethnography, since I don't want to appropriate other Native experiences as I explore the boundaries and entanglements found in my Quapaw-White existence. However, I think it is important to backdrop this work with the history of settler-colonialism as an ongoing assimilationist process, as those are the processes that help create some of the confusion and misunderstandings that I make visible through this autoethnography.

This dissertation is about what I learned from the experience, why my research was misguided, and how I grew to better connect with my communal understanding, unique identity, and boundaries, as a citizen of the Quapaw Nation. While the original study could not be completed as planned, this autoethnography is an effort to show the valuable information the experience provided. My stories are from the perspective of an Indigenous Quapaw-White educator and doctoral student in curriculum, and my struggles to conduct research within the insider-outsider hyphen. It is simultaneously a story that shows the complexity of being Indigenous, and the process of navigating and negotiating research while reflecting on my ongoing assimilationist interactions with educational systems, and the STEM fields. As educators, I believe that there is a lot to do, both internally and externally, when educating Indigenous populations and inspiring them to find a place for STEM in their life goals.

Smith (2012) writes that "history makes the positioning of an indigenous person as a researcher highly problematic" (p. 111). I saw this conflict as an outsider. There is a historical context of Indigenous peoples as subjects of research. I wanted to write about this conflict but did not fully understand how to position myself as an Indigenous researcher. My own history would be problematic in understanding Indigenous research. How to connect with Indigenous researchers and the field of Indigenous research that is forming would become part of my experience. Smith (2012) speaks of an agenda for Indigenous research. Her agenda promotes research projects which prioritize healing, decolonization, spirituality, and recovery. Within these are many components that connect Indigenous research to the good of society. Smith states that "these terms seem at odds with the research terminology of Western science, much too politically interested rather than neutral and objective" (p. 122). And further, Indigenous research "is not sequential development" (p. 121). A change in my personal perspective after decades of

science training would be needed for me to take a new look at my research agenda. Indigenous research as a method of healing arises from this perspective.

Connecting with the Quapaw community and my Quapaw family has become a crucial part of my research. Smith (2012) lists several Indigenous projects and connectedness is one of them, “connectedness positions individuals in sets of relationships with other people and with the environment” (p. 149). To position myself effectively in understanding my research I needed to connect with a Quapaw historical past, my Quapaw family, the Quapaw community, and other Indigenous peoples. I would find that I was disconnected more than I imagined, and this created barriers to positioning myself and conducting research from an Indigenous perspective. When Smith (2012) confronts forced adoption as barrier to connecting, I must also confront my own adoption and assimilation, as she explains “being reconnected to their families and their culture has been a painful journey for many of these children, now adults” (p. 149). My personal journey into Indigenous research would require research into my own connectedness and healing.

Writing from an autoethnographic viewpoint seemed a necessary transition when I realized the value of the conversations I wanted to share and what I had learned through this experience. Ellis (2004) writes about autoethnography, “I learned as much from what I felt as from what I learned” (p. 10). At first, I hesitated to write an autoethnography. When I reflect on the beginnings of my research, much of what I wanted to do as a researcher was to be true to Indigenous student’s stories. As I learned more about autoethnography, the more autoethnography seemed like the method of inquiry I should have used all along. I knew I wanted to tell my story of being raised in an educational system that prioritized and centered student learning on Western science methods, and then later being trained to teach those methods to students. But I also knew I needed to hear the perspectives of Indigenous peers who are

engaged in the STEM fields. It is important that those stories be respected. I found that autoethnography works to see the world through the eyes of the research participants, and embrace their unique perspectives that have value, and to convey those experiences in a way that is faithful to the participants' life (Ellis, 2004). As Ellis (2004) elaborates further, "stories are the way humans make sense of their worlds" (p. 32). There becomes an overlap of science and art, or rather, at least allows for a tone of writing that prioritizes a truer form of my voice – full of curiosities, confusion, and unique perspectives. While that overlap was originally uncomfortable for me, over time I grew to understand the purpose of this overlap and it was something I agreed with and even enjoyed. Autoethnography seemed like a perfect fit for what I set out to do, I just did not know it when I started the project. The process of taking the stories I had and trying to take them apart "scientifically" was the opposite of what I had hoped to convey, and it is liberating to find that there are other ways to learn and present knowledge, and deepen our understanding of highly unique social contexts. Indigenous autoethnography, as described by Bishop (2020) strives to this complexity.

I was confident that the right methodology for my research should be autoethnography when I read Carolyn Ellis (2004) explain, "I tend to write about experiences that knock me for a loop and challenge the construction of meaning I have put together for myself" (p. 33). I wanted to challenge, or rather, interrogate what I knew about science education. The years of working through my Ph.D. had given me "ah-ha" moments that changed my perceptions of how to teach. Those years of study and research also created a better vision of myself. How I define myself influences the way I teach. Being a better teacher meant gaining a better understanding of who I had become and how my perception of being Native American had also changed. Therefore, being a researcher also follows this same logic. Reflection and a cycle of evaluating and

reevaluating becomes a method of inquiry that is both process and product. Improving the self improves the teacher and the researcher.

Autoethnography allows me to look at myself and others through a lens that exposed the imperialism and colonialism that built the education system I grew up in and therefore informs my approach to teaching, doing research, and my everyday being. From this positionality, I believe it is necessary for me to do my homework before I do my field work, which is crucial to improving the way science is taught to include, inspire, respond to our Indigenous students in culturally sustaining ways. Smith (2012) describes imperialism and colonialism as being two terms that are:

> Interconnected and what is generally agreed upon is that colonialism is but one expression of imperialism. Imperialism tends to be used in at least four different ways when describing the form of European imperialism which started in the 15th century: (1) imperialism as economic expansion to imperialism; (2) as the subjugation of others; (3) imperialism as an idea or spirit with many forms of realization; and (4) imperialism as a discursive field of knowledge. These usages do not necessarily contradict each other rather they need to be seen as analysis which focus on different layers of imperialism. Initially the term was used by historians to explain a series of developments leading to the economic expansion of Europe. Imperialism in this sense could be tied to a chronology of events related to discovery, conquest, exploitation, distribution and appropriation (p. 22)

The words imperialism and colonialism tend to be interchangeable. I will attempt to stick to the word colonialism unless quoting. The impact of colonialism on education is touched on in this dissertation but not fully explored. Sabzalian (2019) states that “it is imperative that educators

recognize that colonization is not historic, nor a phenomenon that happens elsewhere, but a structure materially, economically, and discursively embedded into the fabric of the US and other nation-states like Canada." (p. 16). I am still in the process of learning how colonialism has shaped the world I live in and influenced the Quapaw Nation.

The terms Native, Native American, and Indigenous may seem to be used interchangeably in this autoethnography. Warner (2015) pointes out in his own writings that while it may seem customary to refer to all the Indigenous peoples of North America with a single term, it is not accurate. Sabzalian (2019) similarly acknowledges "I recognize that any such terms (Native American, American Indian, Alaska Native, Native, Indigenous) gloss over and collapse the rich linguistic, cultural, spiritual, geographic, and political diversity of Native peoples and nations; yet I use these overarching terms, recognizing limitations in such a task" (p. xvi). Whenever possible, tribal designations rather than broader terms are preferable (Pewewardy, 2000). I use the term Quapaw when speaking specifically about my tribe. But in cases when discussing a larger population, a broader term is necessary (Hawkins, 2005; Sabzalian, 2019; Warner, 2015). There are multiple terms to choose from for this purpose. These would include, but are not limited to, Native American, Indigenous People, First Nations, and American Indian. All seem to be acceptable for one reason or another (Warner, 2015). Alaska Natives and Native Hawaiians are typically referred to separately. Dealing with terminology expresses the difficulties in dealing with identity and the mess I often find myself in when trying to do research. For a long part of the writing process I was comfortable with using Native American, but that has since changed to using Indigenous peoples for a more global context.

Since this is a non-traditional dissertation it does not follow the typical chapter order I set out with in my proposal. Much rewriting has been done and there is now a need to outline what

to expect in each chapter. Chapter 1 is an introduction that sets the background and context for my relationship with the Quapaw community and my relationship with education. It parallels my experiences to grow as a Quapaw citizen while growing as a science teacher and researcher. Chapter 2 explains my use of Indigenous autoethnography as a method for research along with my rational, purpose, and framework. Connections to Quapaw ways of knowing, sites of data, and use of Tribal Critical Race Theory important to this study are explained. Chapter 3 is about how growing up and being adopted out of the tribe influenced my early education and teaching, and how connecting with the Quapaw community has changed my perspectives. Chapter 4 outlines the original research study I began while simultaneously examining it through a Tribal Critical Race Theory lens and Quapaw lens to better understand misconceptions I had about research in Indigenous communities. Chapter 5 reflects on how connectedness with Indigenous communities, healing with stories, and Indigenous perspectives have influenced my career, family, and education.

Chapter 1: Introduction

Despite being a citizen of the Quapaw Nation, I grew up in a small mid-western town of middle-class white families. I was separated from my Quapaw family and raised by a middle-class white family. It would not be until I was thirty-six that an event would open the door back to my Quapaw family, that would drastically alter my perception of education and how different groups of people learn. The more time I spent with my Quapaw family, the more I began to realize that Western ways of thinking and learning were not universal, and that being Quapaw was much more than the tribal enrollment card that I carried in my wallet.

I had been teaching in public schools for five years when I reconnected with my Quapaw family. Since I had been trained in a predominantly White university, I learned to teach science the way it is taught across most of the United States and my classroom looked like the ones I learned in as child – Eurocentric. I did not understand at the time that this was only one way to teach and learn. It was just one of many things I did not yet understand about the relationship between Indigenous peoples and science, or their relationship with educational systems.

As Smith (2012) explains, Indigenous peoples are still being colonized, as science, education, and construction of generalizable knowledge through research are an essential part of the order created by imperialism, and the settler-colonial processes which continue to unfold. However, she further explains how the order created by colonialism made Indigenous peoples an "Other" and brought disorder to colonized people. So, as I grew up passing for White while attending predominantly White schools with Eurocentric curricula, I did not grow up in the world of the colonized, but that of the colonizer. This space between the colonizer and the colonized is a strange and confusing boundary to stare at for so long, from childhood through adulthood, and not fully understand. I had a lot to learn about colonialism, imperialism and their

effects on the Quapaw and other Indigenous peoples when I set out to do this research. I am also realizing I will likely never be done trying to understand these entanglements.

Native American voices, like all Indigenous voices that have been colonized, have been overwhelmingly silenced. Smith (2012) writes that "indigenous peoples want to tell our own stories, write our own version, in our own ways, for our own purposes" (p. 29). But the "negation of indigenous views of history was a critical part of asserting colonial ideology, partly because such views were regarded as clearly primitive or incorrect" (p.31). This perspective that ideas outside of the modern Western view are primitive and therefore wrong, is what I grew up with. I was raised that there was a universal history and that history is one large chronology, with Othered worldviews labeled as mythology, and that societies move forward in stages of development as an infant grows into a fully developed adult. As Smith (2012) elaborates, history is about power: "Through the curriculum and its underlying theory of knowledge early schools redefined the world and where indigenous people were positioned within the world" (p.34).

My experiences of being Quapaw did not include an understanding of the colonial influences on education when I began my adult life. Without the connection to my Quapaw family, I had only suffered mild bouts of dehumanizing racism. The response to this was to just keep quiet about my lineage. I looked White, so I could usually just pass as White and move forward undetected, but still confused and insecure about what it truly means to be Quapaw.

In retrospect, my understanding of being Indigenous was not anymore of an understanding than anyone else that went through the public education system. My journey to improve science education for Native Americans began with a complete misunderstanding of what it means to be an Indigenous person. I did not know it at the time, but I had to undo the lessons I had been taught. I had to interrogate and critically reflect on my understanding of

Native American history and Western science. But since I did not know that is what I needed to do; I did not set out with that goal.

As Smith (2012) says the "…process of decolonization can be extremely messy" (p. xii). As my internal and external tensions rose to the surface during the academic context of the doctorate, pursued through settler-colonial institutions of education, there is a need to sort out my entanglements and better understand them. As Pewewardy (2015) describes, before embarking on any form of Indigenous leadership in education there is a need to first discover the sovereign self and make a move toward conscientization – an enhanced level of critical consciousness that allows us to better understand our complex existence as citizens of Indigenous nations. Therefore, I begin with my point of re-connection to my Quapaw family.

The disconnect with my Quapaw family began when my mother left her first husband, my biological father, when I was still a baby. I never met him and never knew him. By the age of three my mother remarried. I had a new dad and by five I had a new last name. This adoption took place before the Indian Child Welfare Act of 1978, a Federal law that governs jurisdiction over the removal of Native children from their families in custody, foster care and adoption cases. It gives tribal governments exclusive jurisdiction over children who are members of a tribal family. The Quapaw were not part of my adoption. My mother and father, along with two half-sisters would be the family I grew up in. The Quapaw family would not be hidden from me. I would visit my Quapaw grandparents, but never again would I see my Quapaw father or interact with the Quapaw community. Through letters and stories, a connection to my Quapaw family formed, and remained, as I grew up in a typical Westernized American family household. I had a good childhood, raised by loving and caring parents. While I speak of my Quapaw father,

I have only one dad, the man that adopted me. And we share a very strong bond of father and son.

My Quapaw father would go on to marry again and have two more children. My half-sister and half-brother were people I knew existed but never got to meet growing up. I often wondered what they were like and what they thought about me. But I had no idea where they were or how to meet them. I did not know if they grew up like I did, disconnected from the Quapaw, or if they grew up within the Quapaw community. The two half-sisters I grew up with are not Quapaw. I grew up slightly different, connected to something outside the family. My connection to the Quapaw was a lonely space I did not share with anyone. Even as an adult, I had no idea how to connect more with my Quapaw family. This concerned me some but more so after the birth of my second child. I worried that the two children I was raising would feel even less of a connection.

Five Day Fire

A new connection to my Quapaw family opened on a Sunday morning in September 2007 when I received a phone call from the half-sister I had never met. I did not take the call and she left a message for me. In the message she simply said who she was, that she wanted to know if I was James Imbeau's son, and if so to let me know he had passed away. She left her number.

I had known my Quapaw grandfather and grandmother. I visited them. I had been to the land where they lived. I had learned some of the family history. But I had never known Jim. And now I never would. It was hard to take. I sat there in my living room thinking about all the times I wondered how Jim and I would someday meet. The room became empty as I tried to connect to the places in my life that could attach to this new event. I could feel the memories of my teenage self, struggling with the emotions of anger at a father who let me go. I could feel the loss of a

grown man never knowing what it was going to be like to ask Jim why he stayed away. Anger and loss fit so easily together. It was hard to know what it meant to lose him, but I had a sister now that I wanted to meet. What did she know and what would I learn?

The next day I took my wife and two children to a funeral home in southeastern Kansas to meet my sister's family. Jim had been living in the area of the lands given to the Quapaw after the forceful removal from our ancestral lands near Little Rock, Arkansas. The land was given in the form of allotments in what later became northeast Oklahoma and southeast Kansas. I had been to this area before, I had been to funerals before, but I was not ready for what actually happened. It was early evening when we arrived, and we walked up the steps of the funeral home. It was a beautiful old house on the main street of town. Walking through the door put me in an old entryway with a staircase going up and reception room to the left. As I entered the room full of people, I scanned the room desperately. Where was she, who was she? And then I saw someone that must be her. Standing on the far side of the room was a woman with dark brown hair. And for the first time in my life, I saw someone else with my eyes.

I did not look like other people in the family I grew up around. I knew I was adopted by my father. I grew up in the town he grew up in, surrounded by his family. I had my maternal grandfather's chin and I was told I was tall like my maternal great-grandfather. But that is where the resemblances seemed to end. I often felt alone in my world and not always a part of it. I also learned young that sometimes it was better if people did not know where I came from, or maybe that it was easier to simply not explain or elaborate. But there, in the funeral home, was someone that looked like me. It is a memory etched in my mind, soul, and spirit. I knew I had arrived somewhere, or maybe returned. This moment was less about a door opening to someplace new but a path to return. A way of reconnecting to people and a place. While stuck in that moment of

seeing myself in someone else, an old voice from the other side of the room said, “Oh, Harry made it.” That statement was immediately followed by “No, that isn’t Harry. That’s the other one.” And a whole room stood up and came to me. They introduced themselves as my family. They greeted me like they had known me my whole life. It was like I had been away for a long time and everyone was glad to see me again. Everyone knew who I was. I had returned. Only in the presence of family does someone not have to explain who they are or why they are there.

I was taken to the casket of my Quapaw father by one of his cousins. A beautiful Pendleton blanket with a native pattern was laid on the floor in front of the casket. Jim’s cousin encouraged me to go up to the casket and touch Jim. The casket was open, and for the first time since I was an infant, I looked at Jim. His eyes were closed, and he seemed at peace. His long dark graying hair was in two braids coming down the sides of his face. I did not expect this. I had seen pictures of Jim when he was younger. He was rounder and heavier like his father. In the pictures, he looked like me. But now he looked much older. His face was thin. The cousin said it was a good thing if I touched Jim. I would be letting him know I was there. I had never touched a deceased person. It was not something I had been asked to do at a funeral before. I reached out, held Jim’s wrist, and whispered, “I came.”

Jim’s cousin talked about customs that were new to me, as he explained that the blanket at my feet was there to record the footsteps of those that came to visit. A fire was started the day Jim died and remained lit until his burial five days later. I still think about that fire. It still burns for me. I have the memory of that funeral and all that came. The footprint blanket was later presented to me. The blanket is a spiritual connection to the funeral. Several days later, while lying in bed, I felt as though someone lightly took hold of my wrist, and I could hear the words, “I came.” The memories of seeing my sister for the first time, meeting my Quapaw family, and

touching Jim can still bring tears to my eyes. The flood of emotions attached to that day at the funeral home are still overwhelming. I feel how important that moment is to the child and young man in me. But the sensation of being touched on the wrist days later is calming. There was forgiveness for Jim. Moving forward with a life that included my Quapaw family meant going back to where my life began. I was starting to reconnect. A new way to look at the world and think about how it works began to open. My life was not going to start in one place, at one moment, and move forward to a specific end. My experiences will come back on themselves multiple times. Circular, not linear, would start to become a more natural way to look at things.

Since the funeral, many more trips have been made to the Quapaw lands and more family have been met. The tribe is *wahą́* (family). The stories are history. The stories are knowledge. The stories are part of me. Being connected to my Quapaw family and community, and those stories, is something I did not have before.

Before the Fire

Jim passed away a year before I completed my master's degree in Education. At that time, my view of the world contained few influences from being Quapaw. I was educated in White schools where education about Native Americans ends with westward expansion, as if Natives do not exist anymore. As per our textbooks and curricula, people like the Quapaw are most often a conquered people and gone from the modern narrative in classrooms and books. According to Shear, Knowles, Soden, and Castro (2015), 87% of Social Studies standards in US are in a pre-1900s contexts, which ultimately works as ongoing erasure that continues the assimilationist trajectory. Furthermore, Ladson-Billings (2003) reflects what I experienced going through school and still see today when she says:

> We see them as welcoming European settlers, joining them in a Thanksgiving celebration, guiding them as they explore the west, being massacred as settlers push westward, and finally being removed and subdued by Andrew Jackson. After the 'Trail of Tears' American Indians disappear from the pages of our textbooks and the curriculum. For our students American Indians are museum exhibits. No discussion of the ongoing plight of Indians in America is available to most student in our schools. The contemporary Indian rarely emerges in the classroom. At most, our national discussion of American Indians focuses on gambling casinos and alcoholism. (p. 3)

My personal version of being Native American was just enough to separate me from other White males. My limited experiences of colonization and racism would sometimes remind me there were advantages to being White. There was a certain perspective and way to view the world that comes from history books in classrooms. That perspective is what I later taught in my own classroom. I had never learned another way to look at things. You never know what you do not know until it is revealed to you.

I had started the master's program mostly to complete what I had started during my student teaching year. At the University of Kansas (KU) a bachelor's degree in education did not include certification. The certification program, that followed an undergraduate degree in education, included graduate courses. I had met students from other states that were just getting the bachelors' degree at KU and planned to teach elsewhere. I also met people that did not intend to teach. They were going to go on to become researchers in education. This was my first introduction to education as research. There was also at least one student that was just completing the program to get a degree without ever intending to do anything with it. I think he may have started with the intent of teaching. He reminded me of myself when I started my

geology program at the University of Wisconsin at Oshkosh. I think I always knew I was not going to be a geologist. Maybe it was the first signs that Western science and I did not always get along.

Jim was bringing me back to a place I had been before, a place where I was not sure what I was doing. Finishing what I started was what I had been taught, it was what I knew. Always move forward. The graduate credits I earned while going through student teaching would expire so I started my master's degree in 2004, just two years after I started teaching.

It has now become difficult to explain why I became a science teacher. That part of my life is slipping away. The self-identity I had as a child does not match what I have now. I was raised by teachers and saw the world through the lens of teachers. My father, the man that adopted and raised me, earned a Ph.D. in political science when I was nine. The world I grew up in was one that could be explained by standard research practices. My mother has a master's in Education and earned it with an amazing research thesis that received honors. I saw the world through the lenses of researchers that trained others on how to teach and research and build our collective understanding of how our society works. But my parents are not Quapaw. They do not have an Indigenous perspective. They did not teach an alternative perspective to me. The strong feelings and attachments I feel for my parents is not compromised by connections to my Quapaw family. But reflecting on these emotions does help me with the entanglements that exist as I negotiate the intersections of these worlds. The world my parents raised me in is not wrong. It is just different, and they did not have the tools to introduce these ideas because, like me, they were trained in institutions of education built on a foundation of assimilation and erasure of Indigenous peoples.

Growing up I sometimes connected with the education system I was in, and sometimes I did not. That, in and of itself, probably is not unusual. I remember being a terrible student, despite receiving good grades. I learned easily in school but did not perform well in day-to-day classroom activities. I saw something similar in the students that presented themselves in my own classes. I wanted to know how to help them succeed. I saw students that did not fit the mold of how the classroom was set up to learn. My master's degree helped me see that traditional ways of doing things did not work with the population of students I worked with. This led me to try new things in the classroom. I have seen other new teachers do this over the years, so I knew I was not breaking the mold. Young teachers are shown how to do something, and we modified it to fit where we teach and our population.

Before starting the master's degree, I ended up detouring from teaching to become a learning coach, a job designed to help struggling teachers perform better. It was in an urban middle school that I was introduced to a mixed population of students from a community that had, like Natives, experienced historical inequities and other forms of racialized trauma. The new teachers there were woefully unprepared to help those students learn. My employer was convinced that Western science had a way to collect data on these struggling new teachers and supply a methodology to aid them. Here I saw a research system that did not work. Science as I knew it was not working. There was a cultural divide I did not fully see. The reality of the situation was blurred to me.

Like me, these young teachers were trained to teach a certain way. A way that was not culturally sensitive to the diverse populations they ended up teaching. I could see that I was working with students that not only grew up differently than me, but also had different perspectives on the world. The teachers did not know how to respond to the way the students

were behaving, and the students did not know how to react to the way the teachers were teaching. They were all disconnected, just as I was with Indigenous populations. This did not stop the research group I was a part of from creating a research model based on Western approaches to learning. I could see the research struggling, but I did not understand why.

I am not sure if the other coaches doing things their own way hurt the program, or the lack of consistency, or the director's focus on his own literary career was to blame. But I felt like science was not being done right, or possibly it was a misapplication in a particular socio-cultural context. Either way, I left that job and returned to the classroom. I went back to the same classroom I left a year before and the student population I had learned to teach. Some of it was to secure a better job and safer career. But there was also a level of comfort in returning to an environment I knew and was confident with. The experience of being fully immersed in a foreign environment would become useful as I examined my own teaching and when it came time to connect with my Quapaw family.

I took my new perspective that culture was impacting education and started a master's degree in curriculum hoping to improve my ability to reach students with backgrounds different from my own. I sat in classrooms taught by White professors surrounded by White students as I had done most of my life. But now I felt like something was missing. Where were the perspectives of those Smith described as the Others?

I could sense at the time that something was missing. I had been exposed to clashes in culture and education as a learning coach, but I was still viewing the world with Western eyes. That all began to change when Jim died. My eyes were always different until I met my sister. Not just physically but figuratively. I have Quapaw eyes. How would the eyes of my family and ancestors see these situations? The events of Jim's five-day fire opened more than a door or

even a window into a different world. At first, I felt like the roof had been torn off and I could start to see the vast universe that existed but yet unknown. But that was the view of the researcher in me, the Western researcher. Jim's five-day fire would eventually burn down the whole room I lived in.

In Kansas, where I live, fires come each year. Fire burns across the prairies but it does not destroy as it looks to the uneducated eye. The fire is necessary, it is part of life. Where people stop the fires, the land suffers. Burning cleans, nourishes, and starts anew. Research on prairie burning in Kansas over a ten-year study done by Abrams, Marc D., et al. (1986) supports claims that burning increases biomass in the following year. When the prairie burns it decomposes the grass leaves and destroys woody plants like young trees and shrubs. The common juniper plant tries to grow in the prairies of Kansas but uses up vital resources for grasses and ultimately struggles to survive. Removing the junipers by burning heals the soil and prevents erosion (Ansley and Rasmussen, 2005). Burning gets rid of things that should not be there and readies the land for the next growing season. Native Americans purposely burned the land at different times to promote growth (Williams, 2003). However, Williams notes that "generally, the American Indians burned parts of the ecosystems in which they lived to promote a diversity of habitats, especially increasing the "edge effect," which gave the Indians greater security and stability to their lives. Their use of fire was different from white settlers who burned to create greater uniformity in ecosystems" (p. 2). My purposeful destruction of the walls that prevent me from seeing things from an alternative point of view, from connecting, will be a healing process.

The language around healing in Quapaw has more than one word as it is seen from different perspectives. During the 2020 Grand Council meeting for the Quapaw, I was introduced to the Quapaw Ki-Ho-Ta Center. The tribe had moved all of the social services to one building

and called it the Ki-Ho-Ta Center. In the O-Gah-Pah language, *ki-ho-ta* means to, *improve*, *get better*, to *be good to*, or *for one*. It is one way to talk about healing in more than just a physical way, a more holistic way. The design and structure of the Ki-Ho-Ta Center allows for the providing of holistic services for tribal members. The center houses tribal court, family services, and counseling services. Having all these services under the same roof, allows the Quapaw to work better together helping the community. The term *ki-ho-ta* becomes a way to connect my healing process to a holistic Quapaw perspective of healing.

After the Fire

The first time I wrote about the funeral was in my multicultural education class during my master's program. Reflecting on the funeral contributed to a deeper realization that there was more to the world than the perspective I was raised with. Nothing I had learned so far fit perfectly with perspectives from other cultures. I was going to need to more frequently interrogate and be critical about the content I taught and how I taught it. What was the point of science education? I needed to find a way to make my career fit into a bigger world that did not always agree with scientific methods.

I did not know enough to begin to work with Indigenous perspectives in science, but I began to adjust lessons to recognize the responsibly and failures of science. The version of science I taught my students, was a way to find answers to questions. But I stressed to students that it was not always the best method of finding answers. Or as Peshkin (1988) describes when he discusses the role of subjectivity in research, "one's subjectivity is like a garment that cannot be removed. It is insistently present in both the research and nonresearch aspects of our life" (p. 17). Subjectivity or bias, I showed them, should not only be recognized but was also unavoidable. It was better to recognize how bias would influence the outcome of research. I felt

the need during a lesson on environmental disasters and superfunds to inform the class that I could be bias. The land in our discussion belonged to my tribe, and my family were the people most impacted by the contamination. The Tar Creek Superfund in one of the largest environmental disasters in our country. The contamination of the Quapaw lands by lead and zinc mining has yet to be resolved nearly a hundred years after mining began. Discussions on colonialism and racism were not yet part of my lessons. But it was getting harder to separate evolving and reconnecting Indigenous parts of me from the White teacher running the lessons. Hiding in plain sight was not going to last much longer.

The Fire Cools

Keeping your head down and following the plan laid out by school administration is a great way to hide. As I neared a decade of teaching, I really felt like change in my life was necessary. The more I learned about the Quapaw Nation and my Quapaw family the more I realized how much I did not know, and given my positionality as an insider-outsider I will likely always need to operate with a healthy degree of humility when it comes to knowing, or being Quapaw. My newly discovered brother was taking an interest in our family history and we began to work together to learn more. We started to attend the annual powwow consistently and visit the Quapaw lands more often. The first powwow I attended was like a family reunion. My brother and his wife, along with my sister and her whole family met up at a hotel in Joplin, Missouri the week of the powwow. I knew nothing about Grand Council Meetings at the time, so we were just there to experience the powwow as a family. There was a feeling of being an outsider. We were spectators.

The annual Quapaw powwow is open to the public. I figured the worst that would happen is I would just be seen as a visitor if I couldn't find additional family. The weather turned bad

and we were notified that the powwow was moving indoors. This happens sometimes and the location changes. This time the powwow moved to the Quapaw High School gymnasium. Trying to remember this event shows me the importance of the land. I have been to two indoor Quapaw powwows and they are not the same as being outdoors. The sound of the drum and the power of the singers is somewhat different outdoors. There is something larger about it. People are not just sitting around the singers and dancers but moving around. People are visiting, shopping, and eating. The tribal powwow grounds have been used for over a hundred years and I sit where my grandfather sat, and his grandfather. The feeling of being an outsider has diminished over the years. There were annual council meetings to attend and more family to meet. And while it all sounds like I was connecting more with the Quapaw community, I was not seeing what I needed to if the Indigenous part of my identity was going to become a part of my classroom teaching. Some of that comes with the notion that being Indigenous is about much more than feathers, the drum, powwows, and culture fair exhibits. But Indigenous perspectives in science requires a much deeper and sustained level of engagement, something I will likely always be pursuing.

My master's degree had made me a better teacher by opening up new ways to look at educating many types of students, but I was not addressing racism or colonialism. As a matter of fact, I did not even understand colonialism's impact on my family's culture. I was still trying to act like I was completely White and I was still teaching that way. I was trying to use Western scientific methods to meet the needs of students that did not fit the mold of a traditional science classroom. And I did not yet understand why that was not going to work. But I did feel a sense of disconnect and thought that maybe it was time to move out of the classroom. Instead of switching to an Indigenous perspective and using Indigenous methods, like stories, I decided to get out of teaching.

I felt like I was getting pretty good at teaching by this point, nearly a decade into my career, and thought I could learn to teach teachers. I was already helping much of the school staff with their technology and I knew they could use technology better, so I decided to get a doctorate in educational technology to become a learning coach. None of this had anything to do with being Native or improving science education in my classroom. It had been nearly five years since Jim's fire and I had yet to walk through the door that had been opened. I only looked through the door trying to understand the world on the other side. I thought I was done with being a science teacher. I switched districts and quietly began work on my doctorate with the expectation of leaving the classroom when I completed the degree.

The doctorate began with lots of scientific methodology on researching education, including rigorous stats classes. I was learning science again and how to use it. This statistical use of science began to influence how I taught science in the classroom. I was teaching more to my students on what science was and how it worked. Meanwhile, I was spending more time with Quapaw family and trying to raise Quapaw children. The teacher I was becoming began to separate from the person I was becoming. There was disconnect in my life.

The Fire Warms Up

I have been writing about my journey through the education system and not the journey I was going through in my private life. My education path was different than my personal path. When I envisioned the educator I wanted to become, it did not include the Quapaw I was becoming. The two were very hard for me to navigate together. Fortunately, the educational technology program was not for me. The idea of being a learning coach for technology in schools just sort of fell apart. I then switched to a science curriculum program to salvage what I had already done. My education path was still an effort to move forward. This shift to a different

degree path ended up being just what I needed. I turned; I broke my path. In Ogahpah, breaking a path is *dikkówį̨ye*. Even if I thought I was pushing forward - *óha dé*, I turned – *dikkówį̨ye*. This allowed my personal path into being Quapaw to merge with my educational research path. It just was not my intention at the time.

Since, I grew up around people doing research. The rigor of linear scientific methods was a part of my culture. I had heard of quantitative versus qualitative methods, and I always heard the voice of my old geology prof calling qualitative methods "fuzzy studies." But I was going to have to take a "fuzzy studies" class if I was going to earn a PhD.

Unlike Jim's funeral where I entered wanting to learn more, I did not expect to find anything useful in my qualitative methodology class. But it was here that I found the importance of qualitative methodologies and a different way to learn about the world. A way that was different than the strict, nonbiased, methods I knew. A connection formed between the evolving Quapaw parts of me and the way science worked. It was in that qualitative methods class during my Ph.D. coursework that I wrote the story of Jim's funeral again. But this time it changed something - something reignited. Why did this take so long to happen? I am often frustrated that one of the last courses I would ever take in my educational career would finally allow me to see alternatives that better fit my perspective of a nonlinear approach.

The first time I read Tuhiwai-Smith was in my doctoral qualitative research class. The book was borrowed and one of the first things written in the margins by the person I borrowed it from was "this book was not written for me." How could a book not be written for one kind of person? Smith (2012) wrote "a growing number of these researchers define themselves as Indigenous, although their training has been primarily with the Western academy and specific disciplinary methodologies" (p. 5). She elaborates, "Indigenous research is a humble and

humbling activity" (p. 5). While Smith's words may not have resonated with me at the time, they hit home now. This book may not have been written for the person that loaned it to me, but it was written for me. Smith (2012) elaborates, "this is related to the reality that indigenous peoples are not in control and are subject to a continuing set of external conditions" (p. 121). I needed this empowerment. I needed this path to healing. I needed more Indigenous guidance. Autoethnography has become an incredibly powerful process to learn how Indigenous research can be done while learning more about my Quapaw family. Healing, *ki ho ta,* is an important part of this process and healing has taken place in my educational/research career and in my personal life.

Retelling the funeral story becomes deeper as the characters in my ongoing story take on more meaning and relationships develop. The sister I met, the brother I had yet to meet, and the customs I was introduced to, all have stories that go beyond that day. Those stories influence the way I feel about that day, and about myself. My understanding of being Quapaw started to grow from there.

The funeral story, when told in an academic research setting, allowed me to link my slowly growing Quapaw world with my more fully developed understanding of Western science education. This was a tentative place to exist at the time. My comfort levels were low, and I have to be cautious and specific about how I present my positionality through something such as a dissertation – a document expected to offer up some sort of authority about "being Quapaw." I have to be cognizant that I do not do more damage than good. Therefore, this autoethnographic approach allows me work from this position: someone who operates in an in-between existence and has little communal authority to speak on Quapaw traditions, customs, or worldviews; but someone who can speak to the complicated processes and lived experiences of trying to

reconnect after being disconnected and assimilated through Eurocentric systems of education. Like Smith (2012), “In one sense I was born into one and educated in the other. I negotiate the intersection of these worlds” (p. ix). The funeral, or as I more often think of it, the *five-day fire*, becomes my reference point. My qualitative research classes are the places where my thoughts about science education intersect those of my experiences with Indigeneity and working with Indigenous peoples.

The intersections found within these entanglements led me to develop an understanding that Western science education somehow creates dissonance with Native American students. And here is where, as Smith (2012) says “decolonizing can be extremely messy” (p. xii). She goes on to say that “non-indigenous teachers and supervisors are often ill prepared to assist indigenous researchers” and that “many students simply learn by doing. They often get hurt and fail in the process” (p. 11). I was not going to be an exception to Smith’s concerns. The early days of my research on science education and Native American students was done without Indigenous guidance. I was shocked when things did not go as planned. But what I had considered failures in my graduate program have become places for healing. This autoethnographic effort works to move past those failures and put the concept of failure behind me through process of healing. As Bhattacharya (2015) writes:

> “the de/colonization project unfolds to me in the form of healing and transformation. First, through self-healing: an understanding of suffering of self, an understanding of what oppositional discourses reside within, how they are nurtured and sustained, and how they can be used to reflect on individual and collective pain. Transformation, then, becomes an activity that starts within, an agenda that compels a deep dive into one’s own consciousness. It involves looking through various painful parts of self, the belief systems

> that sustain those painful parts, and the discourses that support those belief systems. It requires, finally, making peace with the pain to understand our own suffering and transformation. Such "homework" is critically necessary before any "field work" can be accomplished for any social justice agenda; without it, we will only feed and amplify our pain, defeating our transformative desires" (p.496)

The confusion and anxiety that has come with being Quapaw during my graduate education needed to be explored as much as the academia. This dissertation is not just about satisfying the academy, it's about healing and deepening my own understanding of what it means to be part of an Indigenous community in a complex and entangled world.

To create my research, I position myself at the intersection of the dissonant worlds of Indigeneity and Western Science, and I want to know more about the uneasy discourse. From one perspective I have the upbringing and education of Western culture and therefore carry a Eurocentric worldview in many ways. This has been the dominant point of view for most of my life. But from an emerging perspective I have the history and connection to the Quapaw community, cultures, and sovereign politics. This doctoral research aligns with a personal awakening, and healing process. The childhood memories of a Quapaw family and loose threads of tribal membership have led to an evolving understanding of these connections as being inherently connected to colonial processes that are still in motion.

Chapter 2: Autoethnography as Method

Introduction

In this chapter, I begin by outlining the historical foundations of autoethnography and explain how I align this work with an Indigenous version of this method (Whitinui, 2014; Bishop, 2020). I will discuss the important structural considerations related to the research process, which are also found in many traditional dissertations. These will include methodological standards for assessing the project, the limitations and value of this work, sites of data collection, and measures of accountability. Additionally, I discuss why autoethnography is scholarly work that gains value from the experience of healing, and that showing is preferential to telling. This chapter serves the purpose of, explaining why this project blurs the lines between researcher, participant, process, and product, while also serving to identify important methodological considerations that are still present within those blurry lines.

Rationale

More stories like mine are needed. I was adopted out of my tribe and continue to experience assimilationist experiences with educational systems that disconnect me from Indigenous ways of knowing. There are minimal accounts of Quapaw specific versions of education and research. Using autoethnography is relevant to telling the story of how I used Tribal Critical Race Theory to frame my research, only to end up turning those tenets onto my own story to help understand the experience.

Research Purpose

The purpose of this project is to explore my own lived experiences, as a Quapaw who was adopted out at an early age, related to my previous educational experiences and research efforts which were aimed at deepening our understanding of Indigenous peoples and STEM

Education, and interrogate my approach to the research to explore what misconceptions and misunderstandings may have prevented the project from being completed as originally planned.

Research Questions

1. In what ways have my own lived experiences influenced my approach to doing research with Indigenous peoples?

2. In what ways has my understanding of being a citizen of an Indigenous community influenced my approach to doing research with Indigenous peoples?

Methodological Frameworks

Acknowledging that this was evolving into a nontraditional dissertation, there is still a need to outline the histories and scholarship surrounding autoethnography. Writing this Indigenous autoethnography requires that I establish a methodological foundation and demonstrate that this project rests on a scholarly foundation.

Autoethnography had been suggested to me a few times as a methodology for a dissertation. If I had connected more with being Quapaw early on, I might have gravitated to it sooner. Autoethnography, while not new when I first learned of it, was and is evolving as a legitimate form of research. Actually, the preference for the term "inquiry" is seen as a more appropriate description used by many authors on the subject (Denzin & Lincoln, 2018; Ellis et al., 2011; Richardson & St. Pierre, 2005). In the early days of my dissertation, I felt as some critics of autoethnography do, that the method has no evidence-based chains of reasoning, no experimental designs or professional norms (Denzin & Lincoln 2018). In other words, I agreed that it felt like "fuzzy studies", and I did not want to be accused of journalistic writing.

I envisioned my younger undergraduate self, sitting around a campfire on a geology trip, listening to my professor joke about the lack of confidence in any kind of "fuzzy" research.

Geology class field trips were standard practice in the department. I only remember one that was done in single day. These were often done over weekends or even weeks. I learned quickly to get my own camping equipment. The university made equipment available, but it was in poor condition. Students piled into large twelve passenger vans and drove off to remote locations to practice data collection. At the end of the day we pitched camp in local campgrounds and hung around a campfire after supper. I think we were supposed to do homework then, but someone always had a guitar. It was this time of day that drew me to geology research, sitting around a fire, sharing stories, and singing songs. My professors often used this time to bestow their wisdom on us. Somehow, I never managed to realize that I could tell you more about the evening campfire than I could about the daily geology. But this is where I learned about “fuzzy studies” and how they were perceived by my professors at the time.

While completing my first bachelor’s degree in geology, I minored in English literature. Learning both scientific writing and literary writing at the same time influenced my opinions on the differences between the two modes of writing. Qualitative research occupied a space I was not familiar with, or so I thought. Quantitative research can be supported and carry meaning with its tables and summaries, and with words that are presumably objective, precise, unambiguous, non-contextual, and nonmetaphorical (Richardson & St. Pierre 2018). At the time I would have agreed to align literature with art and culture to include, taste, aesthetics, humanity, and morality. Only later would I appreciate a time when science and literature were not separate domains. If an author claims work to be nonfiction and truthful, then all that remains is how ones’ truth claims are to be evaluated (Richardson & St. Pierre, 2018). I learned in my science history class how science and literature deviated in the 17th century. How the deviated lines eventually blurred, and the emergence of qualitative methods was not something I was taught.

There is a chain of historical events, as described by Denzin & Lincoln (2018), that leads from the social sciences traditional use of qualitative methods of first half of the 20th century through the modernist or golden age of the 1950's and 1960's, to the blurred genres of the '70's and '80's that included the paradigm wars and what they call the "crisis of representation"(p. 27). It has been a rocky road for qualitative methods, with a substantial amount of paradigm shifts that are working to better reflect the diverse world that institutions of research, usually resting on Western foundations, purports to describe. The first half of the 1990's is called the postmodern and the last half is the postexperimental inquiry. Entering the 21st century leads into the methodologically contested present (2000–2004), followed by the paradigm proliferation (2005–2010), and the fractured, posthumanist present that battles managerialism in the audit-driven academy (2010–2015). All of this allows for the evolution of socio-cultural research to grow from ethnography, to autoethnography, and much more recently Indigenous autoethnography.

Autoethnography focuses more on the writer's subjective experience rather than the beliefs and practices of others (Hayano, 1979). The existence of bias has always troubled me in regard to science and research. I never felt comfortable that a researcher could completely remove themselves from research. Like Peshkin (1988), I feel that subjectivity is always present and should be recognized throughout research. Who a person is, how they got to be who they are, the way they see the world are all parts of conceiving of and conducting research. When I was in my early teens and questioning everything my parents told me, I started to rely heavily on what I knew as facts. How I perceived the world to work guided my decisions.

My understanding that our own knowledge and experiences guide our perceptions came when my father talked about what he thought televisions would be like in the future. He saw a

futuristic TV as something that would hang on the wall like a framed picture and could show pictures when you weren't using it as a TV. That was great sci-fi for the 1980s, but I knew how TVs worked. There was no way to make a TV tube (cathode-ray tube) that was flat and have it still work. The idea of a flat TV was just fiction. My problem was that I failed to conceive of the idea that a TV image could be made a different way, without a tube. Obviously, LCD and later LED lights controlled by computers have made flat TVs that can hang on your wall the norm. After that realization, I sort of assumed that limiting bias was the best someone could hope for.

Despite my own hesitations on bias, I was still faced with the opinion that the experimental sciences assume that truth can transcend opinion and personal (Denzin & Lincoln, 2018). But then I was introduced to qualitative methods that confronted bias as part of research, because any action on the part of the inquirer is thought to destabilize objectivity and introduce subjectivity, resulting in bias. As Richardson and St. Pierre (2018) explain, our selves are always present no matter how hard we try to suppress them. It seems better to me to accept the multitude of viewpoints available and well establish the viewpoint of the researcher. From this context, this autoethnographic inquiry does not claim to suppress my subjectivities. In fact, quite the opposite, it is intended to embrace them and prop up those stories to help deepen our collective understanding about the intersection between slowly re-connecting with an Indigenous (Quapaw) community, as a practicing science teacher.

Another aspect of quantitative research I have struggled with is the attempt to perfectly explain a phenomenon in nature. When taking crystallography in college, I learned the different crystalline structures and the chemical processes that created them. But there is no such thing as a perfect crystal. Each crystal, as it forms, is influenced by its unique environment at that moment in time. This reality leads to the old expression that no two snowflakes are alike.

Snowflakes are water crystals and while the chemical process that creates the crystal can be explained the multitude of factors such as impurities, external forces, and growth rates produce unique results. When holding a crystal in your hand, physics and chemistry can only explain part of the crystal's existence. Positioning ourselves as Indigenous requires an understanding that we are always influenced by a myriad of social and cultural engagements and interactions (Eketone 2008). With the subjectivities gained from my lived experiences, I can confidently say that my experiences are truly one of a kind, and this work is limited to that context. However, this does not mean that others who either share similar contexts or work with individuals who share these contexts may not find value in this work to help them deepen their understanding.

I share a concern with Bishop (2020) that "in coming to terms with my role as 'researcher', I started to wonder if I would, in effect, be endorsing colonial practices by using Western qualitative methodologies instead of Indigenous methodologies" (p. 2). To guide my research, I would need to explore how to position as an Indigenous researcher, from a Quapaw perspective. This means constantly recentering myself. Smith (2012) positions Indigenous research into four directions using her own Indigenous perspective. Bishop (2020) positions her perspectives on spirals "critical reflection on and analysis of experiences during both the research and writing phases. It promotes 'spiraling up' to the literature, to situate personal experiences within a broader framework" (p. 3). Indigenous perspective are nonlinear, and as Bishop (2020) explains, "Indigenous autoethnographies strive to increase complexity" (p. 2). Connecting with my Quapaw family and the Quapaw community with a purpose of healing reveals nonlinear Quapaw perspectives. Recentering on Indigenous perspectives throughout the writing process allow for layers of information to form in Indigenous ways, nonlinear ways, nontraditional ways.

Indigenous autoethnography gives me a way to give value, from the experience of my research, and contribute to a larger body of narratives on Indigenous studies in education, and science education. Smith (2012) talks of cultural healing as a priority for Indigenous researchers. Much of what I came to realize during this research process deals with Indigenous perspectives and the impact of colonialism on Indigenous peoples. My experience is about finding a voice. As Whitinui (2014) describes when discussing not only autoethnography but Indigenous autoethnography, "Indigenous autoethnography as a culturally distinctive way of coming to know who we are as Indigenous peoples within the research agenda" (p. 461). From another perspective, it might be what Boylorn and Orbe (2013) describe in talking about critical autoethnography, as they state "autoethnography is predicted on the ability to invite readers into the lived experiences of a presumed 'Other' and to experience it viscerally" (p. 15). This dissertation, in the end, speaks to Indigenous peoples – particularly those who are sharing a similar backstory as mine.

My perspective has changed during this process. Selecting Indigenous autoethnography challenges misconceptions of others about their identity as Indigenous peoples – historically, social, and politically (Whitinui, 2014). The stories told in this dissertation form connections and seek to show rather than tell what is shared. Whitinui (2014), informed by Rachels and Rachels (2010) along with Jones and Jenkins (2008) suggests that

> "what I want to share as an Indigenous person, requires a deep sense of appreciation for the diversity of Indigenous peoples' world views, moral codes, and culture. Therefore, Indigenous autoethnography seeks to resist the more dominant ideologies by deconstructing and reconstructing various historical accounts. It also seeks clarity,

socially and culturally, by constructing and materializing a new reality to protect who we are and why we are who we say we are" (p. 465).

I also connected with Whitinui (2014) when he talks of delinking from a whole host of dominant discourses and spending more reflection time on what constitutes being an Indigenous human being. I agree with him when he describes: "How we choose to start a story is not only an important determinant in how we place ourselves within, it also dependent upon how we really see ourselves in the world we live" (p. 466). How I was raised, how I learned about science and research, and how I learned to teach science needs to be viewed from an Indigenous researcher perspective. Whitinui (2014) further describes how Indigenous research is "deeply personal…whereby culture, as part of one's journey in life, is framed by our own perceptions and experiences." (p. 471), and how Indigenous researchers are consistently working to "know more about themselves." (p. 473). This is where I am in my life and career. I am learning more about my myself through connections with my Quapaw family and culture. These experiences and connections challenge my current perceptions and create new ones.

I found in teaching science over the years that my time as an environmental science teacher produced the most moments of questioning quantitative scientific research methods. Also, ethical considerations not present in teaching physics or chemistry became more obvious when teaching environmental science. Politics and culture came into context with subjects such as mining. Understanding the complete impact of something like mining goes beyond the biology of an environment. Quantitative research could only go so far. Qualitative research is an inquiry project, but it is also a moral, allegorical, and therapeutic project (Denzin & Lincoln, 2018). For example, when I teach about the lead and zinc mining of Oklahoma, it is important to discuss the impact that the mining had on the politics and culture of the Quapaw people, not just

the impact on the environment and health of the people. A person cannot be "told" about the impact on politics and culture. The result of the mining should be "shown" by someone that sees the issue from the point of view of the Quapaw people that were impacted. This type of qualitative ethnography is needed because ethnography is more than the record of human experience. As Denzin and Lincoln (2018) describe, "the ethnographer writes tiny moral tales, tales that do more than celebrate cultural difference or bring another culture alive" (p. 21). The mining story of Quapaw has a great deal of emotion to it that explains how the people and the land were impacted. Removing the story removes the human experience. The stories of my experiences are a crucial part in understanding what I have learned through this research process.

The limitations of qualitative research exist as well. An autoethnographic study, such as mine, is "humanly situated, always filtered through human eyes and human perceptions, and bearing both the limitations and the strengths of human feelings" (Richardson & St. Pierre, 2018, p.1406). The criteria for evaluating such works can be described as two part. Richardson and St. Pierre (2018) describe the criteria as looking through two lenses, one science and the other creative. They go on to say that students from diverse backgrounds and marginalized cultures are attracted to this viewpoint and method of writing. I certainly found it liberating to write this way as I moved to address my research from the point of view as a person reconnecting with Indigeneity. Richardson and St. Pierre (2018) acknowledge that it might not guarantee a better product, but it does bring to consciousness some of the complex political and ideological agendas and hidden writing.

Richardson also goes on to recognize that the ethnographic genre has been blurred, enlarged, and altered with researchers writing in different formats for a variety of audiences. (p. 1404). The creative analytical process has been dubbed CAP ethnography. "CAP ethnographies

are not alternative or experimental; they are, in and of themselves, valid and desirable representations of the social" (Richardson & St. Pierre, 2018, p.1403). Richardson believes that CAP ethnographies better fit the uncertainties that define the world we live in (p. 1404). This becomes a comfortable place to put my writing as I work through the entanglements of the colonial influenced place, I am embedded in.

Richardson and St. Pierre (2018) also offers four criteria for reviewing CAP ethnography (p. 1406):

- **Substantive Contribution:** Does a piece seem true; a credible account of a cultural, social, individual, or communal sense that contributes to our understanding of social life? This dissertation is an individual experience that contributes to the larger understanding of Indigenous researchers, Indigenous educators, and Indigenous students.
- **Aesthetic merit:** Is the text artistically shaped, satisfying, complex, and not boring so that the use of creative analytical practices open up the text and invite interpretive responses? The hope with this dissertation is that aesthetics of the stories are leveraged to invite readers in and find important ways to respond to the narrative in praxis, or in their own research.
- **Reflexivity**: Is there adequate self-awareness and self-exposure for the reader to make judgments about the point of view from the author's subjectivity? The journey of this dissertation has become the heart of the research. For it to have value it must be presented honestly and thoroughly.
- **Impact**. Does the piece generate new questions or move others to write due to the emotional or intellectual effect of the writing? As teachers we need to be inspired to constantly evaluate our own teaching. Not just our methods but our ethics and points of

view. This journey has certainly changed me as a person, a native, and an educator. Reading narratives such as this do have the ability to inspire others to question their own teaching and points of view.

Sara Tracy (2010) also writes that "values for quality, like all social knowledge, are ever changing and situated within local context and current conversations" (p. 837). Like Richardson, Tracy (2010) stresses a significant contribution as a criterion when offering up her own criteria for excellent qualitative research. Within, what Tracy calls the "Big Tent" of criteria for excellent qualitative research, are eight criteria that echo the same thoughts found in Richardson's four criteria. Tracy (2010) states that each criterion "may be achieved through a variety of craft skills that are flexible depending on the goals of the study and preferences/skills of the researcher" (p. 837). She elaborates to suggest "that each criterion of quality can be approached via a variety of paths and crafts, the combination of which depends on the specific researcher, context, theoretical affiliation, and project" (p. 837).

Eight "Big-Tent" Criteria for Excellent Qualitative Research (Tracy, 2012 p. 840)

- Worthy Topic - the topic of the research is
    - Relevant
    - Timely
    - Significant
    - Interesting

- Rich Rigor - the study uses sufficient abundant appropriate and complex
    - Theoretical constructs
    - Data and time in the field
    - Samples
    - Context
    - Data collection and Analysis processes

- Sincerity - the study is characterized by
    - Self-reflectivity about subjective values, biases, and inclinations of the researcher
    - Transparency about the methods and challenges

- Credibility - the research is marked by
    - Thick description, concrete detail, explanation of tacit (non-textual) knowledge, and showing rather than telling
    - Triangulation or crystallization
    - Multivocality
    - Member reflections

- Resonance - the research influences effects or moves particular readers or a variety of audiences through
    - Aesthetic, evocative representation
    - Naturalistic generalizations
    - Transferable findings

- Significant contribution - the research provides a significant contribution
    - Conceptually/theoretically
    - Practically
    - Morally
    - Methodologically
    - Heuristically

- Ethical - the research considers
    - Procedural ethics such as human subjects
    - Situational and culturally specific ethics
    - Rational ethics
    - Exiting ethics (leaving the scene and sharing the research)

- Meaningful coherence - the study
    - Achieves what it purports to be about
    - Uses methods and procedures that fit its stated goals
    - Meaningfully interconnects literature, research questions/foci, findings, and interpretations with each other

Worthy Topic

One of things I started with when considering my research resonates with Tracy's criteria that the writing be a worthy topic (2010). Is the topic of the research relevant, timely, significant, and interesting? I would say that my original research was relevant, in that improving science education for Native Americans is needed. But this nontraditional dissertation looks at how I have changed through my research efforts and the impact that has on my teaching. I have chosen autoethnography so that my perspectives can be of use to those who might encounter something similar, and the significance and relevance lies in the ability of this writing to reach others and

influence their perceptions and their teaching. Also, as stated previously, there is minimal literature on modern Quapaw perspectives in education, and other Native nations have citizens that have been adopted out as well at a young age. Therefore, there is a need to make these perspectives visible.

Rich Rigor & Sincerity

One of the things I ran into with my research were the challenges of collecting the information I wanted with the method I was using. Something I felt that was important with this autoethnography was conveying the challenges I faced in my original research and the writing of the autoethnography. Tracy uses the term sincerity to describe a study that is characterized by self-reflexivity about subjective values, biases, and inclinations of the researcher(s); along with transparency about the methods and challenges. And rich rigor to describe research that uses sufficient, abundant, appropriate, and complex theoretical constructs, data and time in the field, sample(s), context(s), data collection and analysis processes. This is an honest work about why I made the choices I made, the challenges that came forward and positions I took to deal with them. There was no epiphany to describe what happened as if I were writing an autobiography. What makes this story more trustworthy is that I am a researcher using techniques of showing and evidence from field notes and interviews to make the personal experience more meaningful (Ellis et al. 2011).

Credibility

Credibility in research is marked by thick description, concrete detail, explication of tacit (nontextual) knowledge, and showing rather than telling. This idea of showing rather than telling helped me adjust to a qualitative research. Teaching secondary students over the past two decades has become a lesson in metaphors, demonstrations, and hands-on lessons. Not only do

my middle-school students not always care about what I have to tell them, they do not always pay attention. Teaching science becomes an art in the classroom.

Resonance

Tracy echoes other authors when she talks about making a significant contribution and describes resonance as how the research influences, affects, or moves particular readers or a variety of audiences through, aesthetic, evocative representation, naturalistic generalizations, and transferable findings. Holding a reader's attention becomes as important as keeping the attention of students in my classroom. If I cannot make the subject interesting, I have lost my students and lost my readers.

Ethical

Tracy's position on ethics resonated with some of my earlier concerns with my more quantitative study. Ethical research considers, procedural ethics (such as human subjects), situational and culturally specific ethics, relational ethics, and exiting ethics (leaving the scene and sharing the research). It is the ethical consideration of Indigenous peoples when it comes to science research and science education that concerns me most. With quantitative science research methods and education grounded in Western culture, it does not surprise me that Indigenous studies are finding a home in qualitative methods that are flexible enough to accommodate differing cultural perspectives.

Meaningful Coherence

Tracy describes meaningful coherence as a study that achieves what it purports to be about, uses methods and procedures that fit its stated goals, meaningfully interconnects literature, research questions/foci, findings, and interpretations with each other. This supports Ellis, Adams, and Bochner (2011) as they separate autobiographies that tell from autoethnographies that show.

This autoethnography has a goal to show how my own lived experiences related to my previous research efforts which were aimed at deepening our understanding of Indigenous peoples and STEM Education, and interrogate my approach to the research to explore what misconceptions and misunderstandings may have prevented the project from being completed as originally planned. It connects current literature with questions about what ways my own lived experiences influenced my approach to doing research with Indigenous peoples and in what ways my understanding of being a citizen of an Indigenous community influenced my approach to doing research with Indigenous peoples.

With the backdrop of Richardson's (2018) four criteria and Tracy's (2010) eight Big Tent criteria, Whitinui (2014) supplies the needed criteria for specifically writing Indigenous autoethnographies. He asks that Indigenous researchers reflect on key questions. Who am I and why am I here? Research from an Indigenous viewpoint cannot be about the self. Research must benefit the collective. What is knowledge, how is it applied, how is it transferred, who has access to knowledge, and how does one interpret knowledge? Smith (2012) reminds us that from a Western view knowledge is there "to be discovered, extracted, appropriated, and distributed," all for imperialist control. Whitinui reminds us that we need to know what purpose this knowledge will serve before we start. As I began to look deeper into my research, I realized that my journey, my story, needed to be for Indigenous researchers, teachers, and students, particularly those who share a similar positionality as mine.

Whitinui (2014) suggests that there are four key attributes to inform framing of Indigenous autoethnography. The first is the ability to protect one's own uniqueness. He describes how, "this implies that writing about our own 'storied' lives moves us beyond simply 'validating' knowledge to one of 'celebrating' who we are' as Indigenous peoples" (p. 478).

Therefore, this narrative must "maintain who we are, including our differences, identity, language, culture, and ways of knowing, doing and being" as Indigenous peoples (Whitinui 2014, p. 478). The second key attribute is the ability to problem-solve. This position considers that making adjustments that help craft a story that is well-reasoned, trustworthy and authentic, but that is also about coming to know more about self as it reflects being Indigenous in a world that is constantly changing and evolving. The third key attribute is the ability to provide greater access to a wide range of different methods, scenarios, experiences that support our social, cultural and spiritual well-being and supports the wider Indigenous collective. The fourth key attribute for framing is the ability to heal when learning about self. Whitinui (2014) elaborates that "from this position, writing about self is considered a culturally dynamic, creative, and powerful learning point of difference that moves toward a more universal, performance and or participatory, 'Native' way of knowing and becoming that is relevant in today's world" (p. 479). Collectively an Indigenous autoethnography should protect by maintaining who we are, heal from learning about self, problem-solve by adjusting to an everchanging world, and provide by accessing different experiences. Whitinui states that

> These four attributes are not intended to create a "prescriptive" way of defining how we research "identity," "culture," and" self" as Indigenous peoples. Rather, the firework seeks to pursue an inner balance in the way we explore, describe, connect, interpret, and share our uniqueness as Indigenous peoples. (p. 480)

From the very beginning of my research, before Indigenous autoethnography, I stressed the importance of stories as data for research. How those stories are explored, described, connected, interpreted, and shared has become the focus of this dissertation. This process is nonlinear. Richardson and St. Pierre (2018) suggest that writing is a method of inquiry and research.

Writing as a process leads to product that in turn leads to reflection, reviewing of literature and more writing.

Connecting with the Quapaw Swirl

Pre-Columbian pottery made by Quapaw people often includes imagery of swirls. These swirls are sometimes said to show the four directions or life's direction. I have talked with several Quapaw and found that the importance of the swirl is one of many casualties of colonialism. As a people, we have continued to use swirls and feel a connection to them. If you press someone from the Quapaw community on what is meant by the four direction the answer usually has something to do with north, south, east, and west. These directions are, of course, Western constructs. The Earth turns on its axis, and heavenly bodies of the stars, Moon, and Sun move in predictable patterns. Quapaw talk of north, south, east, and west, but when you examine the words you find that direction has more to do with something associated with the direction. For instance, *osní* for north is wrapped up in the word for cold, *sni*. To go north simply means to go where the cold comes from. Similarly, *mi óttinąbe* means to go in the direction of the sunrise, or east. As Quapaw, our current understanding of direction has been influenced by colonialism. These directions are often thought of as linear, when in fact they are not. If I started walking straight north to the north pole, every direction after that would be south. I cannot turn north, east, or west from the north pole. But maps pretend that these directions are linear. The Quapaw swirl, and its relation to direction, reminds us that we have directions, but they are not linear. The four directions could easily mean forwards, backwards, right, and left. Quapaw also speak of the swirl as the circle of life. Not life that begins with birth, then moves along year by year until it ends with death, but something larger, more encompassing, that is cyclical. This connection to a nonlinear way of viewing direction has been a part of the Quapaw culture since before Western

influence and dominance. The swirl still adorns modern Quapaw pottery, buildings such as the Downstream Casino, and artwork like the O-Gah-Pah Pendleton blanket.

Figure 1. O-Gah-Pah Pendleton Blanket

Figure 1. My O-Gah-Pah Pendleton blanket 2012 showing some of the clans and the swirl. Design contributions by tribal members JR Mathews and Ranny McWatters.

My first realization of a connection to the swirl and its contrast to linear perspective came on a lazy, warm spring day in my backyard. The chore of lawnmowing has taken many forms for me over the years from mowing my parent's lawn, to my lawn, to my neighbor's lawn, and even mowing lawns as a summer job. I've spent a lot of time going back and forth across a yard to cut grass. My house is situated on a north/south running street. Sometimes I mow back and forth from north to south and sometimes east and west. I will occasionally go diagonally northeast to southwest. But on one occasion, while in the middle of this dissertation work, it occurred to me to try something else. It was not too hot outside, I was not in a hurry, and my mind was muddled with the mess of my dissertation. I decided to mow in a swirl. I pushed my mower deliberately to the center of my backyard and started spiraling outward as I mowed. And something happened unexpectedly when I did that. The movement was familiar. I heard the drum of the powwow. I

walked in a circle as if I was in a round dance. I could hear the singing. I wanted to sing. A peace fell over me. I connected to tradition, the land where the Quapaw powwow took place, and the family I share this space with. Now, when looking out at the backyard, there is a swirl to look at. My children love it. They noticed it right away. The swirl is familiar, it is calming, and it is connecting. Swirls are not random, they are deliberate. There is direction in a swirl, but it is not linear. Nature, and even the universe is reflected in the swirl. Storms move in swirls, water swirls, and the Milky Way galaxy is a swirl. Swirls are mathematical and another way to describe natural phenomena. When I consider how to move through my research and consider nonlinear methods, the Quapaw Swirl inspires my method of inquiry and connects me to my data.

Sites of Data

To organize my sites of exploration and sources of data I will be using Bhattachary's (2009) diagram for intersecting continuums in relationships to sites of inquiry. This method has been used and also utilized in Indigenous autoethnographic contexts by RedCorn (2017). Bhattacharya presents two intersecting spectrums. One spectrum goes from deliberate to the unintentional sites of data collection, which allows for both the "planned and serendipitous nature of qualitative research" (p. 123). Some data collection sites are explored purposefully, deliberately, they are planned. Other sites are happened upon through research and self-reflection, they are unintentional. The other spectrum goes from the places that are finite and restricted. Places that are constrained by time and space to others are not. She explains, "If the sites are tangible and finite, then access is limited by time and space...when the sites are intangible...then access to the site is infinite and unrestricted by time and space" (p. 123). These two intersecting concepts create four quadrants in which to organize data. One region is data that

results from research that is deliberate and fixed in time with limited access. A second region are data resulting from unintentional sites of research that are still fixed in time and are tangible. A third region is deliberate research that is fluid with unlimited access. And the fourth region created by this intersection is unintentional research that is fluid and intangible. I will use these quadrants to describe the sites of inquiry I have for data collection.

Figure 2*:* Research Sites and Data Sources

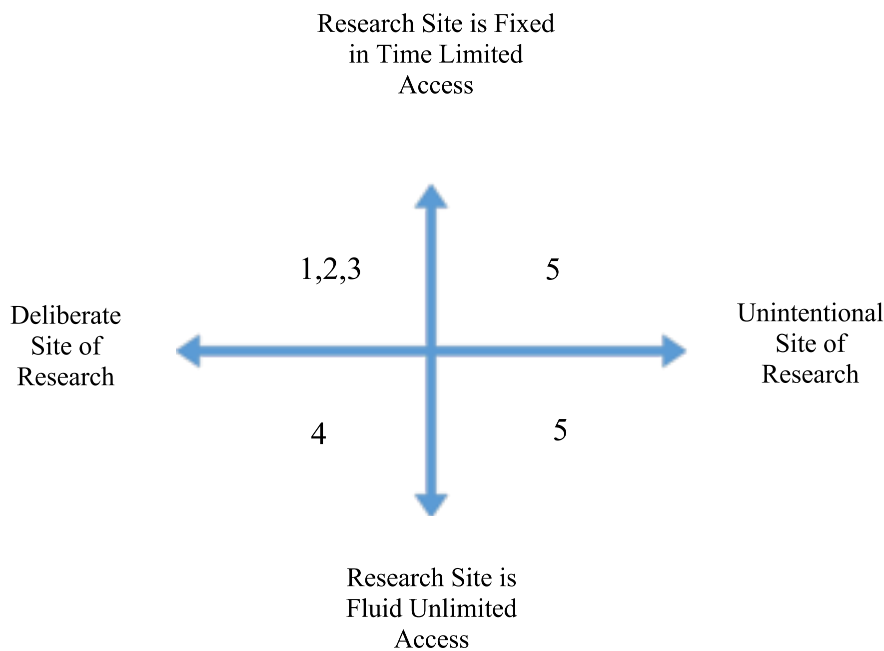

Figure 2: These are my identified research sites and data sources that inform this project, as outlined on Bhattacharya's (2009) diagram of intersecting continua in relationship to sites of inquiry.

I have plotted the sites from which I drew data in this autoethnography (Figure 2). The numbers correspond with the following:

1. My tangible work as a graduate student. These are files from all of my coursework and related studies. This includes my digital data storage as a graduate student at Kansas University. This also includes emails from my inbox and printed items I have kept related to my coursework.

2. My notes as a graduate student. Some are digital and some handwritten but include underlining, highlights, and notes scribbled on paper and in the margins of my books or downloaded journal articles. These include notes and thoughts in my digital notepad stored through my phone, computer, and tablet.
3. My tangible work as a teacher. This includes my stored lesson plans, handouts, PowerPoints, etc., throughout my teaching career. I have digitally stored files from when I taught general science, Earth and space science, and environmental science at the middle and high school levels, and also when I taught educational technology to undergraduate and graduate students at the University of Missouri Kansas City.
4. My memories and lived experiences.
5. My lived experiences across all of these topics between proposal and dissertation completion. I could not predict what new experiences lay ahead at the point of proposal, but I had several new experiences, professionally and personally, which influenced this dissertation, such as interactions with Indigenous and non-Indigenous academic peers in various settings. Some of these experiences produced tangible data, while others did not.

While some of this data can be specifically defined and seen by anyone as tangible and fixed, some is intangible. The unanticipated and more fluid sites of inquiry were essential for my writing. To bring fluid and flexible experiences of the intangible to this place required finding direction and resolution through the swirls and the mess of decolonizing methodologies.

Tribal Critical Race Theory

Tribal Critical Race Theory is an appropriate theoretical framework for Indigenous peoples qualitative research. It differs from Critical Race Theory in ways that need to be

recognized for this study. Critical Race Theory has its origins in the white/black binary struggles. It does not address the colonialism endemic to Indigenous peoples or the sovereignty of Native American Nations (Brayboy, 2005). A look at the structure and use of Tribal Critical Race Theory will show that it is the best framework for viewing the cultural stereotypes and racism experienced by Indigenous peoples. And that these experiences are not a relic of the past.

Tribal Critical Race Theory as described by Bryan Brayboy (2005), has its roots in Critical Race Theory. But as Critical Race theory grew from the race conflict between blacks and whites, it did not translate easily to other minority groups (Castagno & Lee 2007). Additionally, while Critical Race Theory sees racism as endemic, Tribal Critical Race Theory sees colonialism as endemic (Padgett, 2015).

Other minority groups have begun to modify Critical Race Theory to address those conditions unique to different race conflicts. There is a Latino Critical Race Theory, an Asian Critical Race Theory and of course Tribal Critical Race Theory. Brayboy (2005) identifies nines tenets to Tribal Critical Race Theory.

The first tenet of Tribal Critical Race Theory is that colonization is endemic (Brayboy, 2005). This aspect of American Indian history shapes the Indian Nations of today and still shapes the stereotypes held by many Americans. It has also been argued that the historical view of the American Indian is still the predominantly taught image in schools today (Brayboy, 2005; Hawkins, 2002; Fleming, 2006; Warner, 2015).

The second tenet is that U.S. policies toward Indigenous peoples are rooted in imperialism, White supremacy, and a desire for material gain (Brayboy, 2005). Critical Race Theory provides part of the base for this tenant with interest convergence. Critical Race Theory's use of interest convergence states that the dominant race will allow only what are advantageous

to it (Castagno & Lee 2007). For this reason too, it is important to use a frame that attempts to recognize evaluation methods and practices that serve White or Western ideals. As Smith (2012) points out, "the old colonial adage that knowledge is power is taken seriously in Indigenous communities" (p. 16). It is not uncommon for outcome measures to be validated and normed on White, middle-class norms (Letiecq & Bailey, 2004). Western methods of research are meant to silence Indigenous peoples (Smith, 2012). Further, removal of Native Americans from ancestral lands and the removal of mineral resources from Native American lands could be seen as a reoccurring theme. Any aspect that attempts to stifle or profit from Indigenous peoples needs to be exposed in the research.

Tenets three and four have to do with political status and sovereignty. During a 2015 presentation at the University of Kansas, the Bureau of Indian affairs expressed its desire to turn education over to the individual tribes. Then Assistant Secretary of the Interior for Indian Affairs, Kevin Washburn, addressed the future of Indian education with a desire to move in this direction. Representatives and tribal members expressed concern that this was another case of the government reneging on agreements. That it was the responsibility of the federal government to educate Native American youth. This attitude reflects the struggle between independent sovereignty and dependence on the government. As Smith (2012) explains, "Indigenous attempts to reclaim land, language, knowledge and sovereignty have usually involved contested accounts of the past by colonizers and colonized" (p. 35).

Tenet five states that the concepts of culture, knowledge, and power take on new meaning when examined through an Indigenous lens (Brayboy, 2005). Stories told by Native American's will be from the perspective of an Indigenous person and will have roots in culture, knowledge,

and power from where the stories originated. Brayboy (2005) speaks of knowledge as being fluid and able to adapt and change.

Tenet six speaks to assimilation. The assimilation of American Indians begins in the classroom. Descriptions of teaching may need to be reflected on for suggestions of assimilation. Even standardized testing can lead to assimilation (Conn, 2013). Lessons and teaching styles with hidden curriculum designed to educate American youth on cultural norms could alienate cultures such as Native Americans with different or conflicting values.

Tenet seven states that tribal philosophies, beliefs, customs, traditions, and visions for future are central to understanding the lived realities of Indigenous peoples, but they also illustrate the differences and adaptability among individuals and groups (Brayboy, 2005). If these attributes are central, then stereotypes against these views can be viewed as destructive and stigmatic.

And tenet eight states that stories are not separate from theory (Brayboy, 2005). Research and stories are data. Stories told by Native American students can be treated as data. These stories are to be reflected on, meditated over, and remembered. Brayboy (2005) indicates that stories are told with meaning and purpose. The stories told by Native Americans are data and they can be considered as such for research.

Conclusion

Chapter 3 will look back at the family I grew up in and how that education positioned me for the research I started but will also explore how the connections I was making to my Quapaw family would help form a new research topic. Chapter 4 takes components on my original research and reflects on them using Tribal Critical Race Theory to better understand how connecting with my Quapaw family has influenced me as a teacher and researcher. Chapter 5

will examine how to use the Quapaw Swirl to position myself a teacher and researcher with connections I have made and the connections I hope to continue making.

Chapter 3 Staying Connected While Trying to Connect

This chapter serves to explain the personal background that established how I positioned myself at the beginning of my research and how that position changed as I moved through my research. I grew up and was educated in the same way that other White males were around me, and that positioned me to do research as a White male. But it is important to understand how early experiences with racism influenced my perspective and how connecting with my Quapaw family and tribe later in life changed my position on Indigenous research. The process of working towards some form of decolonization, and reconciling my past and present is important to understanding this autoethnography.

Growing Up White

To begin intertwining what I was learning about teaching Western science and what I was learning about being Quapaw had to begin inside me. I had to make sense of the mess. I needed to reconcile the two worlds in me. Half my family was the colonized and the other half was the colonizers. There were invisible walls in my world I did not know how to move. Nor did I understand why those walls were there. Colonialism was something I did not really understand. Visiting my past was necessary to makes sense of the present.

I grew up White being told that half my family was part of a Native American tribe. I went to see my Quapaw grandparents, but they did not look like Indians to me. They were farmers. I never knew my Quapaw father. He was not really a great guy. My mother rarely spoke highly of him. Any behavior of mine that reminded my mother of him was quickly pointed out and corrected. I want to make certain it does not sound like I might romanticize his memory anywhere in my stories. He truly was a mess; from what I can gather from the sources I have. There were reasons my mom left him. His second marriage was not any more successful. When I

met my half-brother years later, he said I was lucky to have not known Jim. But just as I carry confusions and internal tensions with the backdrop of colonialism and assimilation, I am not sure I will ever know how similar tensions unfolded within him or manifested themselves through his behaviors. On one hand, I need to acknowledge how intergenerational and historical trauma is still experienced by many Indigenous peoples throughout the world, and those could be connected to his – and now our – struggles as persons. But I do not know enough to speak to that with much detail, and all I know is that early on it left me with a negative attachment to my Quapaw family and no one to help correct that image.

Being told you are related to Native Americans does not educate you on being one. And having Native American heritage is not the same as being an enrolled member of a tribe and being enrolled does not mean you are automatically a cultural insider. These nuances do not fit into how some of the people in my past have approached someone being Native American. Skin color seemed to be an important part of some people separating Native Americans from the crowd. But for a pale-skinned Native American like myself, I tended to avoid this stereotype most of the time. And such stereotypes confused me when I was younger. Am I White or Indian? What does it mean to be a pale-skinned Native American? I did not have any guidance.

In my life, I got little reminders along the way that some people saw my skin color as different. While I understand now that Indigenous identities are much more deep and complex than skin tone, early on skin tone was one of the only characteristics I had to go on as I wrestled with identity. I was typically fair skinned for most of the year, but not always in summer. My earliest memories come from summers when I would get very dark skinned. This color lingered late into fall when my friends lost their summer tan. I did not think much of it but more than once it was pointed out to me. My parents and sister never tanned only burned. My grandmother

liked to attribute this genetic trait to being Native American and I think the rest of the family did too. I tanned and they did not. But there were also other people that liked to point out I was different. I remember visiting a friend's house when I was in kindergarten and his mom pointing out my skin color one summer. I was five and I still remember it. It made me feel awkward. I knew I was Native American, but I did not really know what that meant at five. I was different or as Smith would say an Other (2012). The rest of the year I was pale-skinned and no one said anything.

I have been told my Quapaw grandfather was very dark. But he did not look dark to me in person, and his pictures never looked dark. But I have since seen pictures of him as a young boy with very dark skin. It surprised me when I saw them. He really was very dark skinned some of the time. When I first saw the picture I had to wonder, did I look that dark sometimes? Maybe I did to some people. I have no idea if my skin color has anything to do with being Quapaw, but it does connect to me to my grandfather. And it highlights the on and off awareness that people seem to have with me being Native American. The unexpected and inconsistent response by other people to me being Native American is what persists in my life. Most of the time it seemed like I was doing the same as everyone around me, and then suddenly I was different. But again, from my current vantage point I can see the layers beyond skin color, and I have still passed for White for most of my existence, creating strange memories of confusion and tension.

There were many moments along the path of my childhood that reminded me I came from somewhere different than the people around me. But it appeared that I was accepted, and I was trained to be like them. The walls were still there, invisible walls that I would occasionally bump into. In high school a friend of mine took me to the club his dad was a member of. A typical men's only club. My friend wanted us to play pool there, but I think he mostly wanted to

show off. He knew the door key code to get in. Just after entering the code on the lock, he paused and looked at me. “Do not tell them you are Native American” he said, “they will kick us out and my dad will get in trouble.” Minorities were not allowed. I was not really allowed. I remember it was night. I remember the air was cool. I remember the sudden drop in my gut, the lost feeling and the sense to keep quiet. I knew his dad was racist, I just forgot that included me.

Those moments became more frequent and severe. There was the girlfriend in college that asked me if I had to be Native American, assuming it was a choice, and said her father would never allow it. She broke up with me. I had an argument in a bar with a classmate over his opinion of Indians as “forest niggers.” And there was the guy on our hunting trips that hated Native Americans because of his experiences growing up near a reservation. He never hesitated to share his negative thoughts. No one in the group ever corrected him. And then there was the frightening moment in northern Wisconsin during fishing season that could have resulted in physical harm. Locals at this time were upset with treaty rights giving certain Indigenous tribes the right to spearfish. This led to organized groups of aggressive protestors that even had special ballcaps printed for themselves. The groups shouted racial slurs and sometimes got physical. Evenings at the local bars made me realize that drunken violence was possible if the group knew an Indian was among them. The message I got was do not be Native American.

I later learned that the treaty rights of that tribe had been withheld for a long time and only recently a federal court upheld the tribe’s right to spearfish. The U.S. Supreme Court ruled in 1983, with what is commonly called the Voigt Decision, that Native Americans in Wisconsin had the right to spearfish in lakes they had otherwise relinquished to the U.S. government through a 1837 treaty. The locals saw it as special rights that were withheld from Whites. They saw these as new privileges for the tribe and not old promises that needed to be upheld. The lack

of understanding of tribal treaty rights is a failure of the education system. The public education system supports the colonial narrative. I grew up with the proud narrative of the colonizers and somewhat confused by the plight of the colonized that was not in our curricula. Then, as a young adult I mingled amongst folks engaging in ignorant and racist manifestations of that narrative, passing in my white skin camouflage, confused and irritated.

Bumping into the "Whites Only" message is just one wall. I tried a couple of times to introduce myself into the multicultural center at the University of Wisconsin Oshkosh as an undergrad right out of high school. Those attempts were all met with confusion by minority members that did not understand why I wanted to be there. I did not look like a minority. Even other Native Americans were confused when they showed up at my dorm door looking for the Native American student they had on their list. I was not Native American to them. There were blank stares and awkward moments where they struggled to find words. I did not know what to make of it. I had not met many other Natives and it felt as if they were not used to Natives that looked like me. They were not welcoming and seemed like they wanted to move out of the situation quickly. It was not the kind of situation or conversation I felt comfortable with. Certainly nothing like the welcome, I received at Jim's funeral. The message I got as an undergrad, do not try to be Native, you do not look the part. It is hard to know in reflecting if the awkwardness of the situation came from both of us, or just me and my own insecurities at the time. Regardless, the connection back to the Quapaw community felt different, and very real.

A Lifeline to the Quapaw

I often tried to ask myself if it was possible to just stop and let it go. Release that part of me and cut the invisible ties with my Quapaw family. My Quapaw grandfather had died before I was ten. I had not seen my Quapaw grandmother in years, and I was pretty sure she was gone

too. No one ever contacted me about her passing. And like so many people around me, I thought that Native Americans lived on reservations. Native Americans went to reservation schools and were all poor. That was not me.

The Internet was in its infancy when I was an undergraduate student at Oshkosh, and I had no idea how to use the Internet to find any information that would alter my view of Native Americans. Everything I found in the university library just reaffirmed my idea of being Native American. Maybe I really could just walk away. I could tear up my enrollment card and walk away not knowing that most Native Americans were not on reservations and most had gone to public schools like I had. No one was there to tell me what I did not know.

Where was the lifeline that kept me tethered to the tribe? In my wallet I kept two things that were unrelated to the world I lived in. One was the enrollment card for the Quapaw Nation and the other was a picture of my Quapaw grandfather. I barely knew him before he passed away. I was told he had tears of joy the day I was born. I remembered the short time we had together. I knew what he looked like, what he sounded like, what he felt like. I could feel his touch and sense his love. I could not deny him anymore than I could turn away from my adoptive father's love. There is a very short list of people in my life that love me as much as the man that adopted me. He has always been my dad and always will be. But he is not Quapaw. There would need to be a way to reconcile them both in my self-identity.

The enrollment card meant I was listed on the Quapaw tribal roll. And the Quapaw Nation had started a newspaper in 90's. I began to get copies of that paper sent to me during my time as an undergraduate. A window into life on the reservation kept me attached. I could not just walk away. That girl in college that wanted me to stop being Native American exemplified

the conflict. I could not walk away. I just was not confident on why. What it meant to be Quapaw was something I wanted to understand.

What I Did Not Know About Being Quapaw – The Rest of the Iceberg

During the early days of married life in Lawrence Kansas, while working on my teaching degree, I saw Jim's name in the Quapaw paper. I knew where he was, and I did not want to burn bridges. I would keep my enrollment, but I would also keep quiet. While working on my teaching degree at the University of Kansas, I did not try to join the First Nations Student Association (FNSA) on campus. But I did enroll my children in the tribe and kept reading the newspaper from the tribe, just in case a path opened to let me connect.

The Internet was completely up and running by the time I started a second bachelor's degree, this time to become a teacher. I had access to more literature and information about Quapaw, Native Americans and methods of teaching science. But it would not be until my master's degree and more so my doctorate that these topics began to take shape in my life. The Internet allowed me to explore. It opened my eyes to a whole world of literature about Native Americans in education and science that was kept at the margins of my educational experiences. Specifically, during my years as a doctoral student, I began to investigate Native American student issues in science education. Some of these readings exposed unexpected connections to imperialism and colonialism. Research being done by minorities about minorities was being done differently than I was used to seeing with empirical methods of research. This made the early days of my dissertation research difficult. I was still going to try a typical, empirical science study to defend a hypothesis about Native Americans in science classes.

In my research, I was surprised to find that there are a large number of Native American students in public schools. Approximately 92% of Native students attend regular public schools,

while approximately 8% attend schools operated or funded by the federal Bureau of Indian Education (BIE) or by individual tribes (Faircloth & Tippeconnic, 2010). I was not surprised to find, that like other minority groups, Native American students consistently perform lower academically than White students. According to a data compiled by Faircloth & Tippeconnic (2010) "on average, graduation rates for American Indians and Alaska Natives (46.6%) were lower than the graduation rates for all other racial/ethnic groups including whites (69.8%), Blacks (54.7%), Asians (77.9%) and Hispanics (50.8%) (p. 12). Even when Native American students are attending the same public schools as other groups, their academic success is much lower.

Without looking at my own experiences I went with the literature and assumed the challenges that Native American students face in learning science may have its roots in culture. I experienced a typical middle-class White cultural response to science education. Science, as it is taught in the United States, is a Western concept not found in Native American cultures. It can then be argued that students growing up in a culture that teaches one way of viewing the world may struggle when asked to view the world in a different, conflicting, manner. It just was not my experience.

I did not know where to start researching and did not realize there was a path to follow as an Indigenous writer. So, I stumbled out into the wilderness of reviewing literature, behaving as I always had when looking for previous research on a topic. Some of this research was done by Indigenous researchers, but a lot of it was not. I did not realize that it mattered.

The evidence I had found supported my early assumptions that Native American groups view science differently, that U.S. education curricula are at odds with Native American culture, and that efforts to address this issue have had some success but may not meet the needs of all

groups. I used these findings to support my initial argument that the cultural conflict, Native American attitudes toward science education, may vary within the large group by culture, and that individual student' attitudes may help explain more.

What the literature failed to reveal to me were specific attitudes Native American students have toward typical science curricula. That missing piece became the cornerstone of my study. I set out to identify some of the reasons Native American students feel they perform poorly in science classes. Interviewing Native American students on how they perceived science as it was taught to them seemed like the best route. I just needed to identify a group of Native American students to interview.

It can be difficult to find a group of Native American students that come from the same tribe. At this point in my life, I was just starting to attend cultural and political events with my Quapaw family. I only had a couple of connections and no guidance. It did not seem possible to research Quapaw. I did not grow up on the reservation. I had not attended the Quapaw school system. I was part of the larger group of Quapaw that grew up away from Quapaw lands and went to school somewhere else. I did not see why anyone from the Quapaw school system would feel comfortable talking to me. Smith (2012) points out that "many indigenous researchers have struggled individually to engage with the disconnections that are apparent between the demands of research, on one side, and the realities they encounter amongst their own and other indigenous communities" (p. 5). This disconnect of being a researcher along with my position as an outsider would make it very uncomfortable for me to approach anyone in the Quapaw Nation or my family for interviews. Smith also states that "what is frustrating for some indigenous researchers is that, even when their own communities have access to an indigenous researcher, they will still select or prefer a non-indigenous researcher over an indigenous researcher" (p.10). Some non-

indigenous researchers offered to help put me in contact with tribes they had worked with, but this turns out to be difficult as well. Since I was uncomfortable approaching tribes as a disconnected Quapaw, and the unlikeliness that any tribe comfortable with a particular non-indigenous researcher would accept me, I was most comfortable finding my own path to interviews.

My study would seek to use Indigenous students that have made the journey through public education in America but may originate from different tribes. Interviewing these students may reveal how perceptions of science challenge them in their education or cause conflict. Learning science can be difficult for a number of reasons, but Indigenous students may reveal challenges and conflicts unique to their culture, background, or experiences. I was going to operate as an outsider. I was not going to make my growing understanding of being Quapaw to be a part of the study.

Finding A Research Topic

The dissertation would be the first step in better understanding how Indigenous students' perception of science influences how they, Indigenous students, approach science classes. From here it was hoped that steps could be taken to improve the science education of Indigenous students. I would survey students for their personal point of view and use this to formulate new questions on how to improve science education to aid Indigenous students.

The approach was naïve. I was still viewing the issue from the lens of classroom teacher. As Cajete (2012) says, "when people embrace modern education they are conditioned away from their cultural roots, not toward them" (p. 146). Attempting to untangle the mess my original research created would become part of the method I needed for research to learn where the mess came from. There needed to be a way to weave the different parts of my experience together.

Smith (2012) describes Western research “as a set of ideas, practices and privileges that were embedded in imperial expansionism and colonization and institutionalized in academic disciplines, schools, curricula, university and power” (p. x). Any non-Indigenous method would not help me understand the mess of the original research. The mess could not be separated and organized into parts or categories. My research would need to be drawn out into threads that would be woven together.

The first most important writings on Indigenous research that I was exposed to came from Linda Tuhiwai Smith. Admittedly her writings did not impact me at first the way it should have. I was still caught up in Western ways of understanding research and knowing. This was also during my first introductions to qualitative methods, so I was getting hit in two directions. One was a new way to do acceptable research within the Western community of research styles. And the other direction was a totally different way to view research within Indigenous communities by Indigenous scholars. But maybe the reality that I did not yet view myself as an Indigenous researcher precluded me from understanding. Smith (2012) wrote “a growing number of these researchers define themselves as indigenous, although their training has been primarily with the Western academy and specific disciplinary methodologies” (p. 5). She goes on to say, “the book is written primarily to help ourselves” (p.18). The safety of learning more about Western methods of qualitative research while ignoring Indigenous methods suggested by Smith would continue to prevent connections with Native American and other Indigenous communities.

All of my literature review had been done from a Western science point of view through the lens of a public-school classroom teacher. I had no thoughts of colonialism or its impact on the public-school system I was trying to improve for Native American students. "Historically, the views guiding the evolution of modern American Indian education have been based on

assumptions that are anything but representative of Indigenous cultural mind-sets" (Cajete, 2012, p.146). There is an arrogance that past research has adequately described the culture of Native Americans and this knowledge just needs to be disseminated to the next generation. It not only removes Indigenous culture and perspectives but goes further to place Native Americans in a historical context removing them from modern day narratives about the United States.

I had a fellow science teacher talking to me about doing some things for Indigenous Peoples day in his classroom. He did not ask me what I thought he should do. He was just frustrated that looking for information on Native Americans in science on the Internet was not giving him information he wanted. His plan was to ask the Social Studies department how they handled Indigenous points of view when trying not to sound completely Eurocentric in history. While I tried to get a conversation going about what Native Americans and other Indigenous peoples are up to these days in science, he kept wanting to steer the conversation back to Native Americans in history. My only conclusion is that, like so many Americans, he is still stuck on the narratives that Native Americans are a part of American history, not America. It is nice that he wants to include a Native American perspective in American history but ignoring Native Americans in the world today is just as damaging as ignoring their place in the past.

Positioning Myself as a Quapaw Researcher

To better understand teaching Western science to Native American students I needed to start thinking about what it meant to be Quapaw for me and how that was influencing my teaching. Gregory A. Cajete (2012) writes that "the educational system teaches Indigenous people to be consumers in the tradition of the "American dream" and all it entails" (p. 145). Do I believe in the "American dream" as a consumer? I've certainly been raised in that world. But spending time with my family on Quapaw lands helps me to see an alternative point of view. The

Quapaw certainly do have commerce. The casino brings in large amounts of money, but it also provides jobs and provides funding for elder housing, daycare, meal programs, the tribal museum, the annual pow-wow, cultural classes on beading and singing, utility assistance, and most importantly tribal health care and social services. The list goes on, but the funds are used for the people. The tribe has started processing beef and bison raised on tribal lands by tribal members. Greenhouses grow food and beehives are maintained to pollinate the crops and supply honey. Sitting in the annual grand council meetings held for the whole tribe describe a method of using Western science and law to reinforce and grow the tribe. But not for the typical consumer ideals I see living in Lawrence, Kansas and shopping at Walmart. There is a difference in perspective.

I remember the first time I stumbled into a Quapaw Grand Council meeting. I knew that there was a sort of "state of the tribe" meeting. A Quapaw family member told me about it the year before. I had been bringing my family to the annual powwow for a few years now but never felt comfortable going to the meeting. But that year, while staying at the casino hotel during the powwow, I got up early and went for a walk. I ended up outside the doors of a large ballroom. The sign positioned at the entrance told me it was the Grand Council meeting for Quapaw tribal members. I was not sure how comfortable I was about a meeting, but there was a buffet inside the room and breakfast sounded good. Breakfast was at least a good excuse to explore the situation. The room was filled with Quapaw citizens. A sense of comfort came over me as I saw a room filled with people where some looked the stereotype of a Native American and many that did not. Being Quapaw was not about how you looked. I still think about some of the red-haired freckly faces walking around that room when I get worried about my own appearance. The room was filled with chairs that faced a stage with a long table for the council members. Occasionally

someone would remind people to get food, things would be starting soon, and do not forget to pick up your packet. I saw the tables at the back of the room divided alphabetically to hand out personalized packets to enrolled members. I thought I would give it a try. I finished my coffee and donut and got in line to see if there was a packet for Heatwole. At the front of the line I gave my name, a person found my packet, and I signed for it on a line that had my name. I was supposed to be here.

Attending the Grand Council meeting has become a yearly thing for me. I bring my daughters. My oldest child gets her own packet now. The packets just have a schedule of the meeting and detailed account of tribal expenditures, legal cases, and things that are going on. It really is a "state of the tribe" meeting. But we vote on the tribal princess and listen to grievances. I learn a lot in these meetings. It also gives me a chance to reconnect with family. This is an important place as it reminds me of the sovereignty of the Quapaw Nation. We are more than the customs, language, and traditions of an ethnic group. We are a sovereign people with a government and the politics that goes with that. The people of the Quapaw Nation do not always agree and there are governmental procedures and politics that address those differences. This place shows a people that were not described in the classrooms I grew up in. In recent months there has been dissatisfaction with the way the Business Committee has handled the income of the Casinos and the Quapaw people responded in elections. An increased need for centralized human health has led to a new community center that handles health, counseling, and tribal law.

One of my favorite stories told during one of the grand council meetings concerned locating land for the meat processing facility. The Quapaw no longer have a chief, but there is an elected council that is presided over by an elected chairman. During this particular grand council meeting the chairman was explaining an afternoon where he and some tribal members were

walking around land near an old water tower that looked just right for the new meat processing facility. This old water tower was part of the attraction of the land. The meat processing plant would need water and this tower would be great if it still worked. As the story goes, the group went up to the water tower to look inside. When they opened the door to the abandoned water tower, they found someone living inside. The chairman said, "luckily he was not Quapaw, or we would have had to let him stay." This story explains a lot to me, and it is difficult convey. A few years earlier in my life I would not have understood the humor of the story.

Cajete (2012) talks about the alienation and frustration that Native American students can feel in a public-school setting. He states that "as we examine the purpose of modern education, Indigenous people must analyze the effects it has had on our collective cultural, psychological, and ecological viability" (p. 146). Thinking about how the Quapaw take modern advances and apply them to the Quapaw Nation helps me take a new lens, a somewhat Quapaw lens. The Quapaw have a meat processing plant, but why? Is it to make money? The reasons to questions like this are often deeper and more encompassing than Western consumer traditions. The annual Grand Council meeting happens when the powwow happens. They are not separate events but part of a single yearly point in the existence of the Quapaw Nation.

The COVID -19 pandemic showed the importance of how these Quapaw businesses fit into the Quapaw Nation. Food from the meat processing plant and greenhouses has always gone to feed elders at the senior center first. After that food is sold to the casino and then the public. During the pandemic even more meat and produce was given to tribal members. Only the excess was sold. Government funds were not immediately made available to the tribe during the pandemic, but money from the businesses kept social services funded for a while. Many Quapaw citizens work at the casino and efforts to keep the casino running during the pandemic were

based on the needs of the Quapaw workers. Signs around the casino displayed the new rules for social distancing and mask wearing but also stressed the need to adhere to the rules to keep Quapaw people safe.

I teach ecology in my classroom and the definition I use comes from a textbook. The book describes ecology as the study of all the interactions among organisms and their environment. And it is probably appropriate at this time to define ecosystem as all of the communities in a given area and the abiotic factors that affect them. These terms become good shortcuts to talk about Quapaw points of view. The Quapaw began the discussion of meat processing facility to include every aspect of Quapaw life that the plant would touch. Quapaw life, this includes the Quapaw government, are an ecosystem. Abiotic factors are non-living parts of an ecosystem, like water. But to make a decision the Quapaw council considers everything involved and the impact of the decision as far into the future as is possible. Even if that includes a man living the water tower. For me, to unite my worlds, I explore teaching as more of an ecology. My lessons need to encompass more than the science curriculum to be effective, to be useful.

My experiences growing up did not include these Quapaw perspectives, and as such neither did my first attempt at research. I was fully assimilated into Western culture and separated from Quapaw. I was unintentionally shielded in a way that prevented me from understating Quapaw perspectives. Realizing that I did not have this knowledge and that I did not understand what I should be looking for helps explain how I got into a mess with my research. Attending the council meetings, powwows and family gatherings helped to start to see the connections I was going to need to understand how better to work with Indigenous peoples. I feel

one of the best ways to heal and grow is to look back at my original research with a new lens and try to understand the mistakes and misconceptions.

CHAPTER 4 The Original Research (unraveling the mess)

This chapter is set up to explore my original research using the same Tribal Critical Race Theory that I framed that research with to show how working through the research changed my perspective on being an Indigenous researcher. It explores my position as a White male researcher at the beginning of the project, from the perspective of the Quapaw researcher I have become (and still becoming). Some of the paragraphs reflect the point of view and writing style from the beginning of my research. This is not the methodology described in chapter 2 of this dissertation. These are some of the perspectives and methods attempted in my research. My first proposal was not written as an autoethnography. This is meant to contrast the position I now have and the writing style I used then to express showing instead of telling.

With Fire Comes Light: Understanding the Interview Process, the Participants, and Putting It All in Context

Collecting stories from interviews made a great deal of sense for my original project. I really liked the idea of using stories as data. The participants would have stories. Native Americans tell stories, right? While Native American stories might seem like a stereotype at this point, stories are important to many Native American communities. But not the way I thought. I had a Western view of stories. The story is a familiar form of data in Indigenous ways of knowing (Brayboy, 2005). I felt Native American views on stories created a dilemma that must be considered. It was quite possible that the Native Americans participants in the study, as the storytellers, would see themselves as the owners of the stories. The intended use of the story must be clear from the beginning of the interviews. The story could not be destroyed in the eyes of the storyteller and it must have a purpose (Simonds, 2013). But again, I was not yet grasping the depth of what stories are, or what they can represent, as an Indigenous person, I was simply trying to respect it from an outsider's perspective.

Understanding that stories can often be sacred and that each community has protocols regarding how to work with stories, did not really set me up for doing research with them. I sat in the library, like I always did, reading all this information written by non-Indigenous people and viewing that information through the lens of my non-Indigenous education. I really was conceptualizing the story through the lens of western research. I felt the interviews, and the data analysis to follow, must be sensitive to the participants' interpretation of what was occurring during the interview, but it was still data to be extracted, in a way. Sharon Merriam (2009) describes data as "ordinary bits and pieces of information found in the environment" (p. 85). I knew this viewpoint should not be the approach of my research, but my education did not set me up to actually do anything but treat the story as standard data that would be coded.

I was just beginning to understand *wahą́* (family) from a Quapaw perspective and could not expand that concept yet. This Native American view of family was something I needed. Merriam uses the term environment to describe where data comes from (2009), but Native American families have been described to me as ecosystems by Indigenous researchers. As I got to know my Quapaw family more, the reflection of the funeral shed more light on my situation. As an Imbeau and part of the White Elk clan, I am part of a family, and that family is a functioning part of the Quapaw community. At the time of starting my research I knew I could not take the stories told by the participants as if they now belong to me, but I did not see the stories as belonging to anyone other than the participant. Now I'm realizing I must consider how the stories might belong to the family, the clan, and even the tribe. I was going to ask permission of the participant without considering everyone else in the tribe that would be included or might be impacted by my work.

This perspective on stories becomes even more clear as I spend time with my Quapaw family and engage in the community – a process of building a more authentic form of trust. One of my family members, an elder in the Quapaw Nation, always has a certain tone in his voice when reminding me that we are White Elk clan. This is partly due to our family position within the tribe, the history behind our family and the association with French settlers. There is a story about the clan in our tribe that we are descended from, and certain stories are only shared within our family, or our clan, but not outside of it. I learn more about these protocols the more I engage with my Quapaw family and community. The last time this occurred, my brother and I were asking questions about our family while driving to Pizza Hut for lunch, and this elder was offering us some specific knowledge from within our family and clan for us to receive. I know by the way my brother and I exchanged glances while riding in the truck that the story we were receiving was not told often. My Quapaw family was trusting me more. It is an odd thing to feel something important is happening when you are riding in a truck to Pizza Hut. I did not have this connection to stories when I began structurally formulating my research.

Hearing about family through story while in a truck on our way to Pizza Hut demonstrates a more appropriate exchange of knowledge and understanding between Indigenous people, something that would change my approach to interviews and data collection. The story came naturally from conversation during a normal activity. There are nuances to the family story I am expected to not share. But there is an important lesson to be shared by talking about the story. I can tell you a little about my family, my clan, our place in the tribe, and how my family influenced the history of the Quapaw. These are things I can share without sharing the story itself. This is how my interviews should have gone, but I don't even know if I'd call it an interview.

I understood a little of the concept of reciprocity when asking for knowledge from Native American participants. But again, it was a more Western research perspective. At the time I understood it to mean that the participant must feel that they are being compensated for the knowledge they are giving. To me that meant conducting a less formal, or less structured, interview. I was stumbling into the first realm of doing research that was different from what I was taught. By less structure I simply meant that I would try to make the interview more like a conversation. I only hoped I would find what I needed in the transcripts. The research cannot be owned by the researcher. I would need to include the participant in the process. The story needed to be co-created and a final version should be shared with the participant. But I had done this before. I did not have the experience of sharing stories on the way to Pizza Hut in a pickup truck. There was no example for me to follow and I wasn't aware of any citations to assist me.

I was still pulling most of my understanding of how to interview and collect data from Western researchers. I needed to read Linda Tuhiwai Smith again, but I did not. And I did not know how to find other Indigenous researchers. But I also did not know that I needed to. I turned to standard research journals and found what I thought was a way to do research in Indigenous communities. When I think about those early days of doing my literature review, I see myself in the library, in front of a computer, pouring over electronic journals from the university library. An article by Scheurich (1997) points out the traditional and concrete positive and modernism methods of interviewing as being dominated by the researcher, he compares the researcher to a kind of omniscient god presiding over the process. Scheurich (1997) further goes on to point out the more creative and fluid approaches of postpositive and postmodern. An article by Marshall and Rossman (2016) led me to believe that there is a historical stand that the interview process has structure, the researcher has latitude for creativity. These were non-native writers helping me

understand that the ridged methods I was used to were not absolute. This gave me confidence that I could be flexible with the interview process, but these authors did not help me understand how to work with Indigenous peoples. It was clear to me at the time that the more creative process was necessary when working with Native Americans that may be opposed to research methods that remove the owner from the story and dismantle the story into parts. I clearly did not understand why this was important and was still acting as a non-Indigenous researcher.

Interviewing as an Outsider

The way I talked and wrote about my interviews ended up very disconnected. I guess I thought it was how things needed to be to get IRB approval. I was back at my friend's house helping with baby while we cranked out a series of questions that formed a coherent order progressing towards the information I wanted to hear. My interview methods were going to be very Western research based. Interviews would be one-on-one and open-ended. This can also be described as a semi structured interview (Merriam, 2009). I saw a process that involved asking a question, formulating questions based on those responses, and questions to guide the interview. Many hours were spent at the library finding articles and reading books on how to interview Indigenous populations. Or how to interview in less structured ways. The whole process seemed very logical and I thought it was going to work out great. There would be three types of questions. The first questions were designed to start the interview process. A few questions would establish the setting "where are you from?" and "what is your tribe?" In retrospect it is hard to believe I would ask such a question. Why it feels uncomfortable now to ask shows how much more time I have had talking with other Native Americans. I was not prepared to start this research. I also felt the type of schooling would need to be established, "did you attend an all Indian school like those on a reservation?" and "what was school like for you?" The kind of

Western research structure I was intending to stray away from was very evident in the questions I was proposing. But there was no one to help me at this point. I thought the research process was going great. Participants would be asked “what do you think science is?” or “what are your views of science?” Also, “how do you feel about science classes in school?” and “did you do well in science classes in school?” The whole interview at this point does not sound like a conversation. But these things were also required in order to get approval to do the research. The institutional research board at KU pretty much demanded a list of questions. But I got lots of help filling in the required forms to get approval. This help came from other researchers familiar with the process and the process made sense to them. This same form that gave me approval from KU was denied by the Haskell Indian Nations University. If I had started with Haskell approval, maybe things would have gone differently.

It was the second type of question that would be created during the interview and based on responses by the participant that I was really interested in anyway. These questions would allow for a participant to expand on an idea or define a response better. Here is where I had hoped a conversation would be created. But looking at the process now I am amazed anyone continued to talk to me much past my first few standard questions. The third type of question would never be realized in the few interviews I managed to achieve. Those questions were supposed to be used to bring the conversation back in line with the intent of the interview. It is easy to get off topic and I felt there should be a way to get back on track. If necessary, the question “how does science fit in this story?” or similar questions to tie the current narrative of the interview back to science. While I had imagined a mutual conversation, I had created a standard interviewer/participant situation. But it wouldn’t matter much anyway. My

understanding of collecting data in Native American communities would only result in three interviews.

Disconnect with Methods and Discomfort with Participants

The first signs that the study was not going to go as planned began with the participants. In the early days of establishing the research I had met with two researchers working with Native American students in STEM programs. I thought my participants would come from them. Conversations suggested that cultural differences were somehow at the root of the difficulties getting Native American students into STEM fields. But delays in starting my research resulted in this contact being lost. So, I turned to FNSA, the First Nations Student Association at KU.

One of my new Native acquaintances had put me in touch with nearly all of the Native American educators and researchers that helped me early on. This included the sponsor of FNSA at the time. The sponsor was excited to hear about my research from one of my acquaintances and had been filled in on what I need from FNSA. She and I set up a time for me to come to one of the FNSA meetings to share my research with the group and see if I could get some participants. This turned out to be one of the worst experiences of my life.

By the time I was ready to interview at the FNSA meeting I had already established that undergraduate Native American students at KU were going to be the source of my interview data. I had written the proposal as this study will take place within the University of Kansas and the focus will be on undergraduate Native American students that are part of the First Nations Student Association at KU and their experiences with science courses. I was envisioning the study to focus on science class perceptions in general. This was to create a sense of what conflicts exist between science classes and Native American students' views. My original methodology was to simply interview and collect stories. My research up to that point had

suggested that stories as data was the best way to collect the information I needed. For this reason, the study was not limited to one area of science or grade level. I also felt like I might only get a two to three good interviews. This meant that reflection of K-12 experiences may be as valuable as current undergraduate experiences with science courses. A small sample of up to five students was all that should be needed. This would establish a good narrative that could be woven together to form a larger understanding of why some Native American students struggle with science as it is traditionally taught.

It's hard to think about that meeting. Looking at what I thought I was going to do and what happened shows my complete lack of understanding in a very raw exposed way. I had not met the individual that sponsored FNSA in person yet so I was not sure how to identify her when I arrived. I can't be sure anymore but I bet I tried to get to the meeting a little late so I wouldn't stand around awkwardly waiting for things to start. By this time in my life I was married, had two school aged kids, was over forty, and had been teaching for over a decade. That was also how I self-identified.

The term "being on Indian time" was something I was getting used to. It is a stereotype but in most cases a reality. I've discovered it is acknowledged and joked about in Indian country. Stereotypically it means being late to something that is scheduled. It does not have to mean late, but I'll admit in my experience it usually means late. So when I say that I tried to be late to the FNSA meeting, I actually showed up early. Standing around awkwardly is what I hoped to avoid but it is exactly what happened. Things only got worse from there.

The FNSA sponsor and I managed to connect before the meeting. She was glad to have a Native researcher come to the meeting and explain their research. I felt comfortable with the way the meeting was organized. I was going to be introduced after some opening business. Then I

could share my research and make a plea for participants. If things had only gone that way. The meeting may have been organized like a traditional meeting with a beginning, middle, and end, but it was not going to go that way.

Reflecting back on the events of the meeting shows a progression of uneasiness on my part. Each moment steadily becoming more uncomfortable for me. I was expected to join the meeting as a FNSA member. I was a KU First Nations student and I sat in a circle with everyone else. I introduced myself when it was time. Not the introduction I had anticipated coming from myself rather than being introduced by the sponsor. I had become just an old graduate student sitting in on what I felt was an undergraduate group. There was one other graduate student there. I think she was a master's student in biology. Her presence may have helped ease my situation.

The introductions led to an icebreaker game. I hate those. I am not an outgoing person nor do I have the personality of an extrovert. I did not participate well in the game, I was awkward, and I think I made everyone feel awkward. Later, when I was finally introduced as the guest speaker, I had some opportunity to explain myself, my age and why I was there. The interest in my research was positive. There was even a little discussion produced by the topic. But when it came to participants nothing developed. After the meeting, the sponsor tried to get a couple of students to visit with us on the topic. I remember her asking one "what do you think about science and Native Americans?" His response was "well I could tell you what my elders might think." And in that response lay one of many pieces to doing research in Native American communities that I was unprepared to handle, particularly now as I look back at my more recent experience listening to an elder share stories on the way to Pizza Hut.

The missed opportunity at the FNSA meeting took the wind out of my sails. I was not sure what to do. My advisors were not completely sure what to do. And this began the longest

part of my research. And consequently, one of the longest parts of writing about the research. Here begins the realization of the mess I was in. The next two years would be a mucking around in the mess trying to make heads and tails of it. As I tried to find new participants. I spent more time with my Quapaw family and my tribe. I spent more time meeting with other Native Americans in education, in research and in STEM careers. All of this was coming together to create one story about research in education. My story of uneasiness with other Indigenous peoples, as an assimilated and disconnected Quapaw tending to the long process of re-engaging with the community. My story of learning to build relationships and connecting beyond the research. My story of being an outsider and learning what it means to do research across the insider-outsider hyphen in Indian Country. My story with the Quapaw community continued to evolve. All of this brought together by a swirl into one story.

My research agenda dictated motions that were counter to what I felt I needed to do and counter to expectations in the Indigenous community I did not know. IRB and standard research protocols sterilize the process in a manner that made my entrance into the community solely tied to research extraction, and therefore made it less palatable. I felt trapped by the design of the study I created. This design did not necessarily meet my expectations of sitting down with people and having a conversation, but rather met the needs of a research study grounded in standard research protocols. I was uncomfortable and so were my participants. With a stalled research project, I continued to move on forming relationships with Quapaw and other Indigenous peoples. These connections worked. These connections were constructive. Set outside the context of a research agenda, I was able to learn more about Indigenous perspectives.

I did not know how to meet up with Native Americans at KU. I had never been a part of a campus Indigenous peoples group. I had very little experience from my Quapaw family meeting

as Indigenous peoples. I had been to a traditional burial and powwow. It seems that approaching my research with standard research protocols designed to extract information in a formal interview process demonstrates why such methods do not bring about results. My participants were uncomfortable and maybe even suspicious of my motives.

The First Interview

The first person to reach out to me for an interview emailed about a month after the FNSA meeting. He had not been at the meeting but had heard about my research at the next meeting and wanted to help. This first interview did not help to strengthen my research. My first interview was with an undergraduate biology major hoping to go into medicine. This was not someone that had trouble with science. He was Osage and grew up off reservation. I remember feeling like this interview wouldn't help, possibly because of the stereotypes I carried in my own consciousness about on and off reservation Natives. The relativeness of his interview was something I could figure out later. I at least had someone with whom to practice.

We met at the library on campus in a study room. I was not very organized, but I had my questions, the release form approved by the IRB and two methods to record the meeting. I was nervous at first because we had not met and I did not look the stereotype of a Native America, but neither did he. The interview lasted about thirty minutes and left me hopeful there would be more. But this was the fall of 2017 and it would take another year to get anymore interviews.

Transcribing and coding the interview happened nearly two years later. I listened to the interview several times and thought about the little study room we were in. I must have been stressed because the interview setting is still very clear to me. When listening to the interview, reflecting on it, and taking notes, a few things definitely stood out. My first participant grew up liking science just as I had. He had access to lots of science classes in school, just as I had. And

he grew up White, just like me. But he knew his Native American family. He was Osage living off the reservation but knew about his family heritage. I did not. But like me, he had support for learning science from his family. He did not look Native American and did not feel any racism. At the time, I did not understand colonialism and did not pursue any discussions to reveal influences of that history in his family. He separated religion, culture, and science when I asked him about any discord with his tribe and science. The reasons for his choice in education were to help Indigenous peoples. He wanted to improve health care in Native American communities.

At one point in the conversation he shared a story about dressing a deer his father had killed when he was very young. This story was the kind of thing I was looking for, possibly because it fit the one-with-nature stereotype I had envisioned capturing. The boy's mother did not want him to see the deer being carved up in the garage and he was not allowed to leave his room. But he told me that he snuck out and went there anyway. The deer fascinated him. His father showed him the different parts of the deer and how they worked. He credits this occasion with inspiring him to pursue biology. After sharing the story he also realized the connection to his family being part of the deer clan. Hunting deer was an important tradition in his family.

When this first interview was coded with the different tenets of Tribal Critical Race Theory, some things stand out against the other interviews – particularly the influence of colonialism, and imperialism. Those are followed, to a lesser extent, with assimilation, alienation and the importance of culture. He felt that Western science was something he understood and which he did well. While this first participant tried to separate his Native American culture from his everyday life it became obvious that the forces that drove his direction in education began with being Osage.

Connecting education and a path in life to being Native American is not something I would have understood at his age. I knew nothing of colonialism or imperialism as it pertained to Indigenous peoples. But a lot has changed since that first interview. I learn more truths about the daily life of Indigenous peoples as I meet and talk with more Native Americans. And it seems every time I read about issues in Native American communities, the concerns reverberate the past. Colonialism and imperialism are still here, and the life of this participant has been clearly influenced.

Looking over the transcripts left me with a feeling that he could see the influence of the colonizing United States on his family and his Native nation. He was attempting to keep separate these two worlds as he navigated a college degree program he did not see as Indigenous. His attempts to separate these two worlds showed up again in my other interviews, but with some difference that came with age and experience.

The Second Interview

It would be another year before I heard from anyone else about interviewing. I brushed a lot of it off believing that things take longer in Native American communities. Making contact with someone might mean months before they were ready to interview. But I was running out of time. I turned to Haskell Indian Nations University and was denied access to their student body by their IRB. This was a shock to say the least. I now knew that something was very flawed in my research approach. I tried in vain to change my research question, to change my research completely, and at times even to give up. Autoethnography was thrown around a few times by different people, but I did not understand it and I did not get support. The direction I was given, and followed, was to stay on course. And eventually someone else contacted me.

Thirteen months after my first interview, I was contacted via email by graduate student in New Mexico. She was Navajo, Blackfeet, and Shoshone-Bannock. This time the connection was made through the director of the Native American Student Services (NASS) for the school district my kids attended. The director had worked with my wife and encouraged my kids to be involved with NASS. She was aware of my research and had encouraged this person to reach out to me and interview. The email was short but explained how she heard of my research, who she was, and why she was interested. As a graduate of Haskell and the same high school my daughter was attending, she used to live in Lawrence. She was now working on a master's degree in New Mexico. Her interest was engineering. So again, I found someone willing to talk but that enjoyed STEM in academia.

This person's experience was not the same as my first participant. She had not enjoyed high school and did not like the competitive environment of the school. My daughter complained about this too. I think Smith describes it as predatory individualism (2012). It has been a roadblock for my own children and seems to have been for this second participant. The first participant talked about all the science classes that were available and taking as many as he could. This second interview talked about liking science, technology, and hands-on learning but did not see a future in it.

This interview was done via Skype. I sat in my dining room at the table with my back to a rather plain wall. On the other end was voice but no image. The Wi-Fi at the coffee shop was blamed for the poor connection. But the interview was good. The conversations were detailed, and she had a lot to talk about. She had a lot she wanted to say. She was more comfortable describing how her culture fit into her life. But I got the feeling that it had not always been this way. She may have been more like my first participant earlier in her life and tried to separate

culture. Now culture was clearer to her. Overall, she seemed to have confidence about her connection to her own community, and their worldviews, that I lacked. But we shared a love for STEM, even if in differing ways based on our own experiences with Indigenous communities.

Science, as she saw it, was separate from her ideals. She described how science would see something one way, she would see it another. But this did not bother her. Science was complex and had purpose. It was not something she embraced. She had always liked science but did not understand engineering and she wished she had been taught differently to see the value in STEM. Her goal was to be able to integrate technology appropriately into reservations. Technology and culture needed to be kept separate in her eyes but could work together. But the education system she grew up in only saw science one way and that way did not work for her. She talked about a lack of guidance with science resulting in very little confidence that she understood science or engineering. Western science is a part of American culture, and I teach that now as part of my lessons on why we learn science. The participant felt that if STEM had been taught differently, she might have appreciated it sooner, or made more appropriate connections with Indigeneity. This was something she wanted me to know - that education needed to change to reach other points of view, and that STEM had uses in places that were not tied to American culture were possible.

During the conversation my own mind wondered to my experiences with science classes. My vision of a future was not as clear as the first participant. I was more like this second participant. I did not know what I wanted to do when I was younger, but I knew I liked science. At times I was good at it. But like this participant, I was alone in those classes. I was not like the other students that did well in science. I was not competitive; I was not driven. I tried to be, but it only alienated me more. My experiences match someone struggling to make science fit into an

incompatible culture but that was not the case. While I was much better at identifying colonialism and imperialism in American culture, I had not been raised that way. So maybe changing the way science is taught can help more than just Native American students. Maybe the participant's frustration with science pedagogy and curriculum did not have as much to do with being Native American as it did with a personality that did not fit the paradigm.

During my first bachelor's degree in geology at Oshkosh, I tried very hard to learn the rigid attitude of my professors when it came to scientific methods. There were hard sciences, and soft sciences. Believe the hard science and question the soft science was the message I got. I remember wondering if a chemistry professor of mine had lost his mind when trying to describe a realization he had while on sabbatical in Asia. Sitting in a large pit class, I stared at an image of yin and yang with two arrows imposed over the top pointing in opposite directions. It had something to do with balance and stoichiometry, I think. He was somehow integrating chemistry into a personal belief system. But nearly thirty years later, I wonder if he was on to something.

Our conversation was less influenced by colonialism than the first participant. But elements of imperialism were there. The struggles with teaching methods and the purpose of STEM in schools showed a clear understanding of assimilationist efforts. She talked about how school did not work for her. Being competitive with other students turned her off to STEM. Knowledge as a source of power over others was being taught. Without good mentors to help guide her or a support to find a path in life that maybe did not fit the expectations or norms, she struggled. She spoke of school having only one way to succeed. Why do we teach this way?

Reflecting on this interview let me see two students at different places in life. The first student was just starting off and still working to find where his Osage culture fit into his life. He seemed to want to separate them into different parts of his life. The second participant had gone

through that process and was now merging the Native American part of her life with her academic life. She had hopes to bring her professional life together with her Native culture.

The Third Interview

The final participant was contacted about the same time. This one was made by introduction. And while this interview was different than the previous it gave me an opportunity to talk with people from different places in life. My first participant was an undergraduate just starting out, my second was a graduate student with lots new ideas, and this participant was a professional with a doctorate in a STEM field.

Skype was used again for this interview and again video did not seem to work. I had set up in my dining room again with a blank wall behind me, but it did not matter. So one interview had been face-to-face and the other two via Skype with no video. As far as the rigors of science go, probably not much to work with it. But I found the experience very educational and seeing my questions answered from people in different stages of life helped me realize some more about what I was really looking for. But at this time, I felt like things might be going my way. This was my second interview in a matter of days and there was hope that I would be able to get more. I was still nervous that I was just going to end up throwing a bunch of stuff together to finish the dissertation but at least I was up to three interviews, even if it had taken a year. And maybe the IRB at Haskell was not going to matter. I had been turned down by them and that meant something. But I was getting scared I wouldn’t be able to write a dissertation.

This interview brought back my concerns that I was not in a position to get the interviews I wanted. This person had connections with Haskell and some of the professors at Haskell I had failed to connect. He had also worked with other Native Americans in STEM forming a small group of colleagues sharing ideas. Native Americans in STEM were talking to each other. And

not always about why so few Indigenous peoples were in STEM. Our conversations revealed that there are some common concerns by Indigenous peoples about how science works in the world, and how the Westernized ideals I teach in the classroom cause real-world problems when applied in business and research.

There is an idea that science can be specific and sometimes too focused. There is a lack of conversation with people working in related fields or related problems. Sometimes the answers found in one situation leads to questions or problems in another and the response is that those problems and questions belong to someone else and do not need attention. For many Native American communities, the Quapaw included, there is concern that all things are connected and therefor a larger scope must be considered when problem solving. I related this to teaching science in school that are departmentalized. I have tried to remain in middle schools that use teaming. This occurs when a group of students all have the same science, math, social studies, and language teachers. It allows us to communicate about the same students but also allows us to see how our subjects overlap.

Sometimes when teaching science, and I would guess more often than sometimes, science is taught without consideration for other topics. Mathematics and language arts certainly overlap in science and I see more often how history and civics also overlap. I believe a science teacher does harm when these other subjects are not addressed in class. I can’t teach the history of science without recognizing the history of the time period. There are historical and social reasons for why my students only see white males in science history. When I started teaching about the Quapaw being impacted by environmental fallout from mining, I was just scratching the surface of a bigger responsibility to address social and political issues that influence how science is used by business.

This interview was similar to my first one with a male that liked science, had a good science teacher, and grew up in a good school system with lots of support. But he did talk about not having Native role models. Like my second interview, this one led to conversations about not knowing what path to take in life. My first interview created a picture of a clear future, but the second two were less confident. And like the second interview, this participant formed images of an education system that let down many students interested in STEM. So many students were described as competitive and just wanting a job. There was a way to be successful and that was all that mattered.

Unlike the second interview, this interview went beyond the disillusioned graduate years to find a balance. Conversations the participant had with other Native Americans helped to forge a view that was more holistic. He talked of a balance between Indigenous points of view with Western science. He described Indigenous peoples as looking at how they, the individual, fit into the larger picture. The questions being answered looked at how a person is a part of something. Indigenous peoples, from his perspective, connect with the environment. He described Western views as approaching something by questioning how to control it.

When I coded his interview for Tribal Critical Race Theory, I found a shift again in the focus of the conversation. My first participant had expressed views that held to colonialism, imperialism, and assimilation. My second interview spoke with a lens that saw less colonialism but more assimilation. But the conversation again reflected the same influences of colonialism, imperialism, and assimilation This third interview saw the same level of imperialism as the first two participants but offered more about attitudes of knowing from an Indigenous lens. And a lot more about tribal philosophies, customs and traditions. There was sense of lived experiences and the power of knowledge in the third participant. Those conversation of balance of culture and

science was new in the story I was hearing. And that there was a bigger picture where things had multiple parts, and showed an image based more on culture and experiences than the pains of assimilation and colonialism. All three interviews showed a consciousness of the influence that imperialism has on education.

Referencing back to those strengths, it reminds me when of Sabzalian writes that “Native survivance is a persistent feature of indigenous communities. Native courage creativity intelligence determination and artfulness acts of native survivance are our inheritance and our legacy as indigenous peoples” (p. 1). Efforts to assimilate through public education seem to be acknowledged realities. In these interviews, resisting those efforts appear alongside efforts to engage in science learning.

Remarks on Interviews

There was at least one interesting theme that came from the interviews. The connections each participant had with their own Indigenous community influenced them in similar ways. I had one participant just starting out as an undergrad at KU, a second participant working towards a master’s degree in New Mexico, myself working on a doctoral degree at KU, and one participant working in a STEM field having completed a doctorate. Our journeys had similar beginnings and a process of separating the two worlds of being Native from the modern westernized world. Later those efforts to separate lead to an emergence of connections to reconcile those two worlds, followed by working to live in both.

The third participant with the doctorate shared some conversation about being young and trying to separate the teachings of a culture from school education. He is Osage like my first participant. Those points of view from a younger Native may be common. My second participant talked about returning to Indigenous points of view during her graduate studies. This shows a

trend in the three interviews of Native people going into STEM, that early on it is easy to dismiss heritage and go with Western science, but that it becomes harder later to dismiss those cultural teachings. In the end it becomes necessary to resolve those conflicts and find balance.

I found my own story to reflect this trend. I simply did not know my Quapaw culture when I stared a journey with science. As I learned more about being Quapaw, conflict began to arise. But these conflicts also reinforced issues in science education and STEM jobs that needed resolution. Now that I near completion of my own dissertation I too see that balance is necessary. Much of American culture seems to be in balance with Western science. In fact, I teach my students that one reason to learn science in school is that this method of problem solving is used in America beyond scientific research. Business and efficiency models come from the same method of testing hypotheses. But not all Americans share a common culture, and this includes Native American students.

The interviews are an important part of this dissertation. They can seem out of place in the autoethnography, but I argue that the interviews lie at the heart of this story. Interviews were supposed to be what the dissertation would be about. I needed to go through the interviews as part of the healing process. Part of the process of connecting with a Quapaw perspective, where the interview methodologies I learned in graduate school, would not apply. These interviews form some of the connection attempts I have made with other Indigenous peoples. While I had hoped to interview Native students that did not like science, and as I've had to confront these assumptions, what I found were three Native students raised in public schools without science concerns at first. As they grow up and try to find a balance between their culture and their occupations, new concerns develop. All three of these interviews were of people that grew up with access to their tribes and culture. I did not, and that has been an added struggle for me. I

have been alone. I did not grow up with connections. How to make connections is difficult. My awkwardness with other Native Americans prevented connections.

I take walks with my own children and making connections comes up. Both my kids struggle with Native American groups at school and in everyday life. But we talk about it. I did not have someone to talk to, not even a disconnected Indigenous person. The more I learn about the importance of connections to cultures, nature, people, and swirls, the more I can help my kids navigate their world. The three participants I interviewed all discussed memories and experiences that were tied to their Indigenous communities. I cannot relate to that in the way they do. My connections came later in life.

Research Beginnings

I can tell you I was very excited to get started on my research. I really felt it was important work and that I would do well at it. But every time I encountered places of confusion that stalled the research, I returned to my same sources for help. None of these sources were Indigenous peoples. I did not understand the importance of finding Indigenous researchers to guide me. I sat in offices talking with advisors, I visited friends and worked at their dining room table, and I spent a huge amount of time in front of my computer, in the library, connected to the Internet. But I lacked those personal connections that make Indigenous research more akin to a collaborative community building project.

My original study was guided by the idea that Native American students' attitudes toward science are crucial to increasing Native American student performance in science courses. This statement alone is a stark reminder that I did not identify with being Native American but somehow thought being an enrolled Quapaw was going help. The questions that I used to guide the study were "How do Native American students' perceive science?" and "How do these

perceptions influence the way they, Native American students, approach learning science?" I developed these questions with help from a friend that did education research and worked with Indigenous peoples. He is not Indigenous and knows it. He also understands his privilege as a White person in America. It relieves a lot of my stress surrounding perceptions of Indigenous peoples when I can talk with someone that realizes their privilege, even while I carry some of those same privileges. But I do not think we talked as an Indigenous man to a White man. I think we talked to each other as two White males that understood privilege and wanted to help break those barriers to minorities. This just strengthens my concerns that talking with Indigenous peoples can still be an awkward, uncomfortable place. We both wanted to help Native Americans in education. Visits with him gave me the results I was looking for but not the results that would help me.

The creation of my study was a back-and-forth between the research methods that my advisor was familiar with and the kind of research I wanted to do. I was trying to figure out how to turn interviews and conversations into what I thought would be acceptable research. I stopped by my friend's house one weekend to get some help formulating my research questions. I did not like the idea of formal questions, but I needed them for my advisor, and I needed them for my IRB approval. With computer in hand and a bunch of ideas in my head, I walked into this friend's house to figure out how to turn ideas into legitimate research questions. He promptly handed me his infant son to hang onto while he carved out a space on his dining room table. Somewhere between bottle feedings and diaper changes, my two research questions were created. From here I could spend hours alone scouring electronic journals to see what other researchers had already found out. The research questions I created are Western perspectives and

would only lead to work done by non-Indigenous researchers. I got what I wanted; I just did not realize it was not going to be as productive for my goals as I originally believed.

Sitting in a glass cubicle in the library I started pouring through online articles from the KU library. Unfortunately, I was still being guided by a traditional approach to scientific research. Everything I was trying to do was designed to emulate what I thought my research should look like. Despite my new fascination with qualitative methods, I still approached my research with a traditional Western perspective. This was the perspective I was comfortable with. This comfort place was where I kept going.

Whenever things got stalled or I felt hopeless, I would run off to my friend for help. I would walk around his living room bouncing his kid while we worked to reinforce my passion to do qualitative research with Native American students. We came up with a long list of things that, we felt, would improve my understanding of Native Americans in education. It seemed at the time that I needed to know more about Native Americans in research, Native American Ways of Knowing, Native American Education, Native Americans in Science, K-12 Education in the U.S., Inquiry-based Learning in Science Classes, Changing Curriculum, and basic Educational Research. The topics seem so sterile in retrospect. It shows how much I did not understand. Going back through the original study and reflecting on what I thought I understood at the time and what I know better now, has been a healing experience. Ellis (2004) writes "that's what you hope for – to change your life and the life of others – for the better, of course" (p. 35), and "through narrative we learn to understand the meaning and significance of the past as incomplete, tentative, and revisable according to contingencies of present life circumstance" (p. 30). To understand what happened to my research study, I will take Tribal Critical Race Theory and apply it to my original research project. Tribal Crit tells us that colonialism is endemic.

Decolonizing and recentering my research from my growing understanding of Quapaw worldviews and Indigenous methodologies, will attempt to unravel my original research and expose the entanglements. This effort should be humbling and better demonstrate how the project should be completed.

All too often I failed to bring the changes in my life that were impacted by connecting with Quapaw to make the necessary connections and changes in my research. My efforts to complete the research mirrored much of what I attempted to do in everyday life. I wanted to know more about being Quapaw. I wanted to know how to negotiate the relationships in my life that were impacted with being an Indigenous person. I took a very Western approach to this, using all my experiences growing up White to handle the challenges. I had no one in my life to discuss these things with. My Quapaw brother and sister grew up as I did, as White Americans. My Quapaw family on the lands of the Quapaw Nation were three hours away. I did not have strong connections with them. I was alone. I did not understand the importance of Quapaw connections to resolve the issues I was facing in my life and with my research. Therefore, these become some of the central themes, or findings, of this autoethnographic reflection of my original research efforts.

Making Indigenous Connections

One of the most pivotal moments for my original study was the attending of an Indigenous Peoples Day event at Kansas State University. This event occurred following my misunderstanding of how to recruit participants. My inability to secure interviews was weighing heavily on me. It is difficult to correctly time when I should introduce the Indigenous people that have joined my life, or the events that have influenced it during my parallel journeys of returning to my Quapaw family and learning about Native Americans in education. Letting go of the

chronological method of describing events has been important. Reflecting on swirls and connecting to the Quapaw community helps me to find Indigenous perspectives. Everyone's story has a place where it intertwines with mine and that isn't always when I first met them. That first Indigenous Peoples Day event at KSU was a big moment.

My kids and I had connected with the director of the Native American Student Association (NASS) in the local school district. The director and my wife had become friends within the school district. When the opportunity was presented to follow other Native Americans to an event, instead of blazing my own trail, I jumped at the chance. I signed my family up and we arrived early in the morning to ride a school bus to the university for a day of guest speakers discussing issues for Indigenous peoples. My youngest child was super excited to learn more about Indigenous issues, even as a middle schooler. My oldest child was more excited about getting a day off school and finding a safe place to learn more about being an Indigenous person. These types of events, put on by Indigenous peoples, can create a lot of anxiety for me and my eldest child. I have become less stressed as I become more confident in my personal description of being Quapaw. My eldest child is still figuring out what it means for her to be Quapaw. On that day, we were both nervous. This particular, cool morning, in early October was going to be filled with anxiety and excitement. I was so glad that I could go to an Indigenous education event with more confident, Indigenous peoples. The disconnect my family felt was obvious. While we knew the director of Native American Student Services, we sat together away from other students on the bus. My kids did not know anyone else on the bus. I could see in them the same discomfort in connecting with being Quapaw that I felt. I needed to start doing more about this. Hopefully events like this were going to help.

At the Indigenous Peoples Day event I would meet more Native Americans working in education from around the country. I was also introduced to the term decolonizing that would slowly start to change the way my kids viewed the world around them, their own family, and spaces they occupy. As they negotiated their colonized world, they would start to see more clearly the impact colonization has had on their lives. I would start to learn from them.

Smith (2012) talks of a time of authenticity before colonization, when Indigenous peoples were intact and had absolute authority over our lives (p. 25). She also speaks of the importance of understanding what it means to be colonized. I did not understand what this meant when I arrived at the Indigenous Peoples Day event. But being in a room filled with people that had family history predating colonization, helped me to begin seeing how colonization has made it difficult to understand the various parts of being Quapaw that are more or less influenced by colonization.

The tribal history in the Quapaw museum says little of what life was like before colonization. But there is a distinct set of events, resulting from imperialism, that have influenced the Quapaw Nation as it exists today. A timeline on the wall of the museum is marked by each treaty that has been signed by the Quapaw people and the U.S. government – our collective story of ongoing navigation, negotiation, strength, survival and resistance that continues to the present.

There is a city park in Little Rock with a historical marker that points out the history of the lands the park sits on. This park once belonged to the Imbeau family. That is my family. That land was ours. It was not sold. It was taken by the government when the Quapaw were moved off our lands. The Imbeau were Quapaw and their lands were forfeit to the government. From my vantage point, our history becomes less clear for a while after that. The Quapaw were moved

around before being placed in what would become Oklahoma and Kansas. Seeing historical markers for westward expansion make me think about the families that lived there before and what happened to them as America expanded west, at least the stories that lurk behind Little House on the Prairie, a curricular favorite in schools

There are maps that show American population densities from pre-revolutionary war to now. A social studies teacher shared a lesson with staff at my school using a series of digital maps showing the progressive westward expansion by the United States. The maps had the continent in white, showing no population. The east coast, the colonies, were colored various colors showing population density. I looked westward, to where Arkansas is now, where the Quapaw were. It was colored white and surrounded by white. Students see this. They think no one lived there. The map does not show Indigenous lands. The map does not describe Indigenous populations. As the lesson went on, the maps start changing. The population colors show more people along the coast. And then the next map shows U.S. population in Arkansas. There is a small white patch where no one lives surrounded by growing populations of Americans. That white patch is the first Quapaw reservation. A white patch on the map surrounded by U.S. population. Whether the map intends to or not, the appearance is that no one lives there. This is how erasure and assimilation occur in subtle forms within our schools – it's a form of violence through a hidden curriculum. I could not help but think of the students that would see this lesson and not notice the white patch where no one lived in Arkansas. That is where my family was. My children would look at that map and see the place where their family was. On the next map, the white patch was gone. The Quapaw are gone from Arkansas – my family, gone.

There was a time when the Quapaw lived without the influence of colonization. Understanding that is important. It helps me see how colonization has influenced the Quapaw

government, our customs, and ways of doing things. The idea of decolonizing spaces that I occupied started at the Indigenous Peoples Day event. Applying Tribal Crit shows me that I exist as an assimilated Quapaw governed by colonizing ideals, and even the processes I've gone through to be able name my context as such doesn't make it easy to understand the depths of how it unfolds in my lived experiences.

Listening to the keynote speakers during my first Indigenous Peoples Day at KSU helped me realize how much I did not understand about education, research, and working with people in Native American communities. I also met someone that could help me understand my research from Indigenous perspectives, and I started making connections with Indigenous educators, along with their ideas and philosophical understandings, that were connected to but operating outside of the connections I was developing with my Quapaw family and community. It was important that I turn my lens from the educational research method I knew to the Indigenous perspectives I was growing to understand as necessary. This redirection, recentering, began a process of intertwining my two worlds. The reality of Indigenous peoples in public education is far more complicated than I could have imagined. And like other aspects of educational research, terminology is messy. Working through the mess is part of the healing. I can start by applying the swirl to recenter my perspective on the mess and reflecting on *ki ho ta* as a Quapaw way to heal.

Struggles with Terminologies and Facing Racist Terms & Imagery

The moment that I started to understand how to forge a single path that included being Quapaw and doing educational research began in one of my early doctoral classes in curriculum. This is where I met the fellow doctoral candidate that later helped me write my proposal while bouncing his kid around the dining room. He is married to an Indigenous person and Native

American tribal citizen. He was the first White person I met that did not deny White privilege. He does not embrace it but acknowledges its existence and that he benefits from it whether he wants to or not. Conversations with him allowed me to reconcile the White side of my family and the part they play in colonialism. Colonialism is not over, it continues. He writes about Native American education as a professor and his writings along with conversations helped me with terminology for the study. It was comforting and enlightening to have conversations about the different terms used to put Indigenous peoples into groups and the consequences of doing so.

Spending time on Quapaw lands around my family and community, the term Indian is pretty popular. My daughter does not like to hear it, but her point of view is different. She sees how the term has been used in school and as a tool for colonizers. My two children have been following me as we try to form family connections with the Quapaw community. Along with my brother and his family, we have gained more knowledge and understanding of our Quapaw family and traditions, and with that an understanding that Quapaw can be called Indians when we talk to each other. Navigating the myriad of terms used to describe what Smith (2012) calls Others is still complicated. I gained more understanding from events, symposiums and guest speakers, and I continue to learn some of that nuance. Connecting with these events has given me more insight and understanding than much of the literature I have read. Furthermore, I also see that connecting to the people I meet and work with at these events is also the process of becoming part of a regional intertribal community of Indigenous advocates and educators that lie beyond my Quapaw community. In a sense, they represent another ecosystem that is not the same, but still tied to my Quapaw community. I try to attend anything I can find and drive to, because this is an ecosystem of connectedness that helps add layers of understanding and builds

important relationships. It’s not just about building relationships for the sake of gaining access to people for research, it’s about being part of something much bigger than my dissertation.

As I and my children have experienced, there are many stereotypes for Native American peoples. My eldest daughter tends to focus on any statements that quietly suggest Native Americans do not exist anymore. Non-Indigenous perceived notions of Natives form from misunderstandings and inaccurate education. These stereotypes serve to support a dominant race (Castagno, 2012; Castagno & Lee, 2007) and to stigmatize Native Americans (Fleming, 2006). There are the common myths that have endured since the early days of colonialism and there are more recent stereotypes based on modern practices of casinos on Native lands. It was difficult in the early days of my research study to take a stand as an Indigenous person for fear of how that perspective would be perceived by the White faculty that supported me. It seems fine to claim Native American ancestry, like claiming European ancestry. But being a Native American person, a member of tribe, is much more complicated. Some non-Natives have prejudice, but many are just confused. They don’t know what a modern Native American person is, and I myself am still trying to understand what that means from my specific perspective.

I have a responsibility to my children. As demonstrations and riots were growing during the COVID-19 pandemic, my daughter could often be heard complaining “what about Native Americans? Everyone always forgets about us.” The oldest and most enduring stereotype is the “dead and buried” view of Native Americans (Hawkins, 2002; Fleming, 2006; Warner, 2015). Research will tell you this idea portrays Native American peoples as existing only in the past. My personal experience has shown me people that seem to understand Native Americans are still around but cannot connect the image they learned in school to a modern Native American. A colonial period image of “Indians” is often the only image that most Americans have of Native

American peoples. This comes from schools only discussing Native American communities from the colonial period and neglecting to mention modern Native American cultures (Hawkins, 2002; Padgett, 2015; Warner, 2015). What I have encountered is people seeming to believe that Native American peoples are somewhere else, away from them, on reservations. When confronted with me, as a Native American person, many people seem to address this a Native American ancestry. Something along the lines of having German heritage and knowing that grandma's strudel recipe came from her grandmother in Germany. I have spent time during my own teaching to correct some of these stereotypes. Colonialism is not over. Colonialism endures. Decolonizing my own spaces, recentering Indigenous perspectives, is hard enough without trying to educate people of the existence of modern Native American peoples and the impact of colonialism.

Fleming (2006) speaks of Native American peoples as pop culture. This perspective simply reinforces the images of Native American peoples from the past. Fleming (2006) suggests that misconceptions about government aid and support of Native American tribes leads many to believe that the tribes are getting unfair handouts. The Quapaw Nation now operates three casinos and has brought in enough money to supply some limited healthcare to enrolled tribal members. I have learned not to mention this kind of tribal assistance. Some people have told me it is not fair that Indians get healthcare. They still assume that all tribes are completely dependent on the federal government and that any healthcare received must be paid for with their tax dollars. There seems to be no understanding of Native American tribes as sovereign nations.

My experiences from talking about casino money replaces the negative portrayals of Native American peoples as savages with a new negative view that Hawkins (2002) refers to as the "pit boss." This view centers on modern casinos and the money generated using the sovereignty status of tribal lands. These views shape the self-identities of Native peoples

(Brayboy, 2005). I met a social studies teacher in a middle school that preached cultural sensitivity but had stereotypical depictions of plains Indians on his classroom walls – unaware of the damage they do. When I asked him how he educated students on modern Native American peoples, he had no response. After a few days, he emailed me thanking me for pointing out the error and that he planned to take the pictures down. Efforts to change the ways teachers are educated about Indigenous peoples have been met with some support but are limited (Hawkins, 2012). This only continues to reinforce the ideas that only what is necessary will be allowed (Castagno, 2012). A dominant narrative forwarded by non-Natives portraying Native American peoples still persists. This makes research, such as mine, very difficult. Smith (2012) says that "history is mostly about power" (p. 35). What is taught in public schools works against Native American peoples, even those like me. Smith also points out, when speaking about a colonizing population, that "their power, their privilege, their history are all vested in their legacy as colonizers" and reminds us that "the old colonial adage that knowledge is power is taken seriously in Indigenous communities" (p. 7). A substantial amount of research in Native American communities is viewed with distrust by that community.

Trying to Understand Native Ways of Knowing from a Western Perspective – Walking in Two Worlds

A pivotal moment for me in my research was attending a guest speaker, Prof. Ed Galindo, one evening at the Burge Union at the University of Kansas. Dr. Galindo is a Native American scientist of the Yaqui tribe. He had once worked for NASA but was now working for the Shoshone-Bannock Indian Reservation. Dr. Galindo had no trouble working with Western science and separating it from his Indigenous world. He talked of walking in two worlds. And what he was doing now shed some light on what I was trying to do. He had been invited by elders of a tribe to help them with an environmental issue. His description of working with the

elders changed my understanding of working with tribes. He was invited. He was a physicist, not a biologist. The elders knew this but weren't bothered by it. The elders knew he was the right person for the job. Hearing the authority and position that elders spoke from helped me realize some of the issues I had experienced gaining the trust of participants.

Dr. Galindo's lecture was the first time I really saw someone doing science in a Native American community and talked about Western science as separate from the community. And yet he talked about how to work with Western science in a Native American community. The lecture was entitled "*Setting a Tribal Research Agenda*" and focused on how universities could collaborate with tribal communities to meet their research interests. This was a significant mind shift for me. I was not going to blend Western science into a story of Native American students. I was not going to use Western science to explain Native American stories. The two were going to be separate. I would stand with one foot in each, as Dr. Galindo had done, and navigate how to allow them to collaborate on my study.

My challenge with this approach was that I was still connecting with my Quapaw family. I wondered, would creating a colonized research world and Quapaw world separate from each other, just mean that I had a colonized research world. Identifying the colonized entanglements of my research was still necessary. And identifying Indigenous methodologies was going to be the only way to resolve my misunderstandings of doing research with Indigenous communities.

The way in which Native American communities view knowledge has been typically described as Indigenous Knowledge (Singh & Reyhner, 2013). I was always led to believe this view of the natural world is different from Western thought. Sharon Nelson-Barber has described European-American (Western) science as being linear while Native American cultures view science as circular (Nelson-Barber, 1995). Elizabeth Mack, et al. (2012) states that "European-

American culture tends to view science as evolving and moving through time" (p. 52). This view can be described as a process that is linear and sequential. And that the process evolves and advances into something better than it was (Mack, 2012). Starting small and building to bigger concepts is how I remember all the science textbooks I have used in my classrooms. I begin by teaching cells and moving to more complex organisms. I start with minerals and build to more complex rock structures. I begin with a nebula and build a solar system. This is contrasted in the research writings with Native American researchers and other Indigenous peoples seeing time as circular in nature (Kitson, 2010; Mack et al., 2012; Rich 2012). Knowledge is holistic (Kitson, 2010). Pewewardy (2018) states that

> While there is no single epistemology connected across tribal Nations, indigenous education traditionally occurred holistically and in social settings that emphasize the individuals responsibilities and contributions to the larger community. Indigenous knowledges are acquired through reciprocal relationships between community members and nature, explorer through a variety of activities and ceremonies, and utilized throughout daily experiences (p. 42)

But let's not forget that Smith reminds us that Western methods silence Indigenous peoples and render Indigenous writers invisible (2012). So maybe it is best to keep an open mind on what is different about the methods. Quapaw Swirls create a mindset where I can break from linear models of thought.

Sitting in Dr. Galindo's presentation at KU did reinforce the place that research has within the culture, at least within the cultures he works. Science in Native American culture is not separate from other fields of study or social or cultural knowledge (Kitson, 2010). Nancy Rich (2012) states that "Indigenous ways of knowing center on the relationship of humans with

the Earth" (p. 309). There is an awareness that involves deep, comprehensive, and tightly integrated understandings about sustainability and human relationships with nature (Rich, 2012). Knowledge is a process but also a relationship. It is seen as something living and treated as such. I would later hear these perspectives from one of the participants in my study. He felt that modern American perspectives tend to compartmentalize and departmentalize to the point that everything is separated into its own place. His concern was that if you are working in one area of research, you can ignore other research. Removing those barriers and working collectively was his suggestion.

Dr. Galindo's presentation came after my initial literature review and after the three interviews I was able to procure. Dr. Galindo's influence came at a time of confusion and frustration for me. In the days before I started my research there was Dr. George "Tink" Tinker, Osage citizen. His background is theology, but he brought two things to my research efforts. The first was a description of his path into his tribe. Like, myself and others, Dr. Tinker was not raised with the customs and traditions of his tribe. He was assimilated into United States culture. He began a journey back into his tribe that was long and included learning the Osage language. It also caused some personal issues with his parents and their difficulties understanding what he was doing. I was able to attend two separate appearances of his. One was entitled *"How the Christians Stole My Land – Legally*" (2017). I was so comfortable during this presentation that during the open Q&A, I identified myself as Quapaw and asked question about teaching science. The event took place at the church I go to. The room for the presentation was small and I recognized many of the members of our church. It is hard to say if it was the church setting, those familiar attendees, or Dr. Tinker himself that made my situation comfortable. It may have been a combination. But there was a connection I felt with Dr. Tinker, as someone separated

from his tribe, and then returning. Dr. Tinker looked more like me and less a stereotypical Native American. The anxiety of presenting myself, a visibly White American, as a Native American person did not seem as stressful this time. His description of the long and complicated process of learning about his tribe resonated with my own challenges. My appearance still challenges me, and I do not think that will change. Racism in the United States often demonstrates as differences in appearance. I went to a second appearance by Dr. Tinker at Haskell Indians Nations University entitled *Deconstruction and Reconstructing Indianness: Coyote's Trickiness* (2017). Sitting in a room full of undergraduates that came from so many different tribes was a healing experience. The students all looked different and had different concerns to raise with Dr. Tinker. Even the university professor that introduced Dr. Tinker did not look a stereotypical Native American. But this was another example of feeling somewhat comfortable in my surroundings while still learning the deeper ways of understanding what it means to be Quapaw. This time I did not speak. I wanted to, but my comfort level was not the same. I could connect with the non-Indigenous people in the room at the church, but I still could not comfortably connect with other Indigenous peoples in a tribal college setting.

One of the things I gained from Dr. Tinker was confidence that connecting with my Quapaw family and gaining a better understanding of what it could mean to be Quapaw might help me understand myself and my position. Maybe I would not become a Quapaw as I had envisioned from a Western point of view. But there may be a time when I can more appropriately participate in the community. A time when I will not fear that all I have are ancestors that were Native American. Citizenship in the Quapaw Nation is not like membership in a club. Connecting with my family was a first step to a better understanding of culture, tradition, government, and family. Just as the Quapaw Swirl taught me to not see a linear path with a

defined end, I now see a larger picture to healing my disconnect and separation from the Quapaw Nation. My part in the story will allow my children to also connect and find their own paths with our family.

Healing and connecting, *ki ho ta*, has also helped me became more confident in sharing alternate perspectives on the natural world with my classroom. Definitions in Western science are extremely important. I teach that in order for science to work, everyone must agree on the methods of doing research and the answers derived from that research. Those definitions are hard and often contain compromise, biases, and assumptions. My favorite example for my seventh-grade life science students is the definition of a living thing. I start with a rock. For Dr. Tinker a rock is a living thing. As a class, we work through how the definition of life could be written to include rocks. I suppose this is easier to accept from a theologian like Dr. Tinker, but it does work in the classroom. I remind my class that I am Quapaw and that I am comfortable understanding both definitions. These alternate definitions of nature help to demonstrate how science works, its limitations, and that Western science is a part of Western culture. People in the United States learn the scientific method and how to use it to solve problems. They are not taught alternative methods in public schools. And they are not taught to question science. The definition for a living thing precludes a virus which does not have a cell and does not carry out the functions of life, except to reproduce when infecting a living host cell. Dr. Tinker was not attempting to demonstrate how Osage ways of knowing could work with science. But my position as an assimilated White American connecting with his Native American family allows me to see alternative viewpoints and perhaps broaden the views of my students, inherently connecting them to this experience of reconnecting.

Dr. Tinker helps me see some of where I started. Lost in a world I did not understand but thought I could. He appeared early in my research study, giving me confidence that connecting with my Quapaw family was possible. Dr. Galindo, like Dr. Tinker, came at a similar time of confusion for me. A time when my research was not working as I had planned it. But when I reflect on the presentations of both, I see how my own understanding has grown and influenced the way I perceive their messages.

Dr. Tinker's presentation guided my early literary research. I chose things from my readings that reflected what I had learned from him. I saw Indigenous ways of knowing as intrinsically connected to the community, the elders, and the Earth while being spiritually anchored (Shreve, 2015). As Simonds and Christopher (2013) explain, "in Native American communities, knowledge is sacred and access to it must be earned" (p. 2189). It would not be until the presentation by Dr. Galindo that I would see this in action. In the beginning I still was not grasping Indigenous research the way I needed to. I mistakenly, with a Western perspective, saw myself working with the elders to get the information I needed. This would support Smith's (2012) assumptions that for Western science "knowledge was also there to be discovered, extracted, appropriated, and distributed" (p. 61). I had yet to understand Smith's ethical approach beyond the ethics of the Institution Review Board at KU. Haskell's IRB would deny my research and help me see that I did not yet understand the role of knowledge in many Indigenous communities.

My early literature review led me to Elizabeth Mack's (2012) interviews with Menominee showing that tribal members were "more likely to talk about nature holistically, spiritually, and traditionally, with an underlying respect for part of nature" (p. 52). This was an example of me accepting something without yet understanding it. I saw this as a matter of

respect, not a matter of connectedness. Mack also noted that “European-Americans were more likely to talk about their role as caretakers and protectors of nature” (p. 52). The difference being that one group is a part of nature and see nature as something larger than themselves, and the other sees themselves as stewards of nature, something they dominate and control. So, while both groups have ethical considerations, Indigenous ways of knowing are embedded within and not separate. Nancy Rich (2012) points to this by saying that “all beings are related and interdependent, and humans are merely part of the circle, not in charge of it” (p. 309). Knowledge is part of the relationship and part of the circle. Knowledge connects places, spirits, and people (Shreve, 2015). These ideas would be supported later on by my interviews, but they did not mean what they needed to. They did not help me place myself within my Quapaw community. Without that, I couldn’t really talk from a Native American perspective.

After all my efforts to get definitions down as part of my scientific research, much of what I had written did not resonate until I heard Dr. Galindo. Pushing through numerous research journals gave me one perspective. The literature had told me that Indigenous ways of knowing are the responsibility of elders, as Cooke-Dallin et al., (2000) puts it, “elders are those persons in a First Nations community who are recognized for their wisdom, knowledge and their life experience, as it relates to the community. They are people who are expected to share their teachings” (p. 173). Elders are considered the knowledge holders (Shreve, 2015). Learning takes place via direct and ongoing experience rather than in the abstract, and a teacher’s role is not one of just imparting knowledge (Rich, 2012). Bradly Shreve references Duane Champagne (Turtle Mountain Chippewa), a professor of law and American Indian studies at UCLA when he says that “Indigenous pedagogies are not geared towards preparing students for the rat race, or to live in a competitive, market-oriented, secular, and individualistic world“ (p. 3). These are all fine

perspectives but what I would later see was a group of elders reaching out when they felt that Dr. Galindo could offer the tribe something. He did not approach the tribe or elders.

One of the key concepts I tried to understand in the beginning was the transfer of knowledge requiring reciprocity. Knowledge is not something to be obtained without regard for how it will be used (Rich, 2012). Vanessa Simonds (2013) discusses some of the conflicts that arise from the differences in cultural approaches to knowledge: “Past researchers have disempowered communities, imposed stereotypes that reinforced internalized racism, and conducted research that benefited the careers of individual researchers, or even science at large, but brought no tangible benefit to the communities” (p. 2185). She also points out the importance of storytelling as a form of knowledge transfer. Research that breaks a story into parts changes the relationship between the storyteller and the receiver thus destroying the story. Researchers also remove the names of those they interview. Taking the name away from a storyteller is unethical in tribal communities (Simonds & Christopher, 2013).

Without the guidance of an Indigenous researcher I did not find the writers I should have. Smith (2012) points out that “Non-Indigenous teachers and supervisors are often ill prepared to assist Indigenous researchers” (p. 11). I may have read the right researchers but failed to connect with their writings. Smith was much more meaningful after my attempts at research, rather than before the research as it should have been. But maybe I was not an Indigenous researcher yet. There was still a tendency to view research with Indigenous communities from the perspective of a non-Indigenous perspective. I was much more inclined to agree with statements like “researchers do not have a right to “discover” knowledge in Indigenous communities” (Simonds & Christopher, 2013, p. 2189). My perspective was that research is done without reciprocity. There is no give and take in research. The assumptions of many Western forms of research may

violate Native American values and ways of perceiving learning. From this I began to form some early understandings that for Indigenous students it may not be acceptable to go into an area to learn something without deciding what will be done with the knowledge and determining what will be given in return for the knowledge. These early ideas would gain more meaning as I connected more with being Quapaw and knowing other Native Americans.

How Native Americans are Taught Western Education

I certainly did some research on Native American education when I started. But I had no window into classrooms designed for Native American students by Native American peoples. I had learned that most Native American students attend public schools. Shortly after listening to Dr. Galindo speak, I attended the Indigenous Science & Math Symposium at the Comanche Nation Higher Education campus in Oklahoma. This event took place on tribal lands by tribal people and the experience was much more than I had expected. Memories of the event have feelings similar to those of the funeral home during the five day fire.

Showing vs. Telling

The unexpected benefit from the Symposium at the Comanche Nation Higher Education campus encounter came from a Native American teacher, Whisper CK. She worked at the Native American Community Academy in Albuquerque, New Mexico and pretty much ran the symposium. Whisper ran her classroom as an Indigenous person. Lessons were tied to the lives of her Native American students. When teaching science, she used cooking in traditional ways to express knowledge of science. Using an old sand volleyball court outside the school, Whisper and her students created fire pits to cook. She even had students create pot ash to use instead of baking soda for fry bread. This sort of hands-on approach to learning has been promoted in my time as a teacher but Whisper takes it a step closer to connecting with the daily life of Indigenous

peoples. Whisper explained the impact of burning sage and other herbs to clean the air. The smoke of sage has antibacterial properties, according to Whisper. Her methods in the classroom were the same as those she used in her presentation, showing not telling.

Whisper taught me about smudging that day. We used cedar cut that morning and simple string for sowing. Grabbing the cedar sprigs, bending them, holding them, and winding the thread to hold them created a moment of understanding for me. It was almost therapy to sit and wrap the string. I felt I should sing, if I knew the words to the songs that were in my head – a kind of yearning for me, but not really knowing where those songs fit, or when they're supposed to be sung. The rest of the activity in the room was drowned out to the simple task of wrapping the cedar. I continued to pick up pieces of cedar, bend them and then wrap them tightly. Being taught how do something by an Indigenous person in an Indigenous setting was helpful, and something I didn't experience in public schools. It was healing. It makes a good place to reflect on when I think about teaching as an Indigenous person. Nobody ever taught me these things.

The lesson of smudging has created more than connections with teaching and with science. Whisper helped me connect community importance with teaching styles and understanding the scientific aspect of smudging. But when I took her lesson to my own child, it created a connection with Quapaw and our family. I sat with my teenage child on the back porch and showed them how to take the cedar, how to bend it, and how to wrap the string around it. There were questions about if we were doing this correctly. I wondered if I forgot something, but we did not have any Quapaw training to go with it. This was about a parent and child, as we disconnected from the world around us. We were connecting and growing our relationship with Indigenous perspectives and ways of doing things. It was just the wind, cedar, and wrapping of string. The cedar smelled good, but it was the prickly kind that poked our fingers. We talked

about Quapaw Swirls and the benefits of smudges to community, both curiously reflecting. There was no timeline for the activity. It took as long as it took and when we were done, we reflected on the process. We didn't quite make them properly; they didn't look the best. We needed practice, and some guidance – more learning. But we will come back to this, again and again. We understand that this process is connected to much more that we cannot see at this moment, but that as we continue to engage more answers will come.

Western Ways of Classifying Native American Students in Schools

I grew up off the reservation. My children have grown up off the reservation. I may have blamed that for our disconnected situation. But later I found that most Native American students are not on reservations. Whisper talked about reservation kids and city kids in her talks. The participants in my study grew up off the reservation. And I've heard other students speak of growing up off the reservation. But they all have connections to their Native American families and communities. These connections can become complicated in ways I did not understand.

Researching for my study led me to make some of the decisions that Western science has made when classifying Native American peoples. The disconnect that I had can be seen by how I wrote about classifying people based on location. My own misunderstanding of reservations and the vast numbers of Native American peoples not living on reservations hurt my ability to connect with people in my study, and I'm now realizing some of my ignorance related to on and off reservation dynamics.

Native American peoples are sometimes divided into groups, those that reside on reservations and those within the general population of the United States. Many studies focus on groups within a reservation, and this perspective is not lost on Native American students. While attending a Native American Student Services academic award ceremony for my kids, I listened

to a panel of young Native American students from the high school talk about their experiences as Native American students in a public school. One of the students had only recently found out he was part of a Native American tribe, another was not visibly Native American, and one spoke about the difficulties of trying to interact with Native students from a reservation when she lived in town. Native students struggle with many cultural barriers created by the colonialism that persists in their education. I could see some of their struggles in my own kids and memories of my own youth. To hear a young Native American girl talk about how she felt disconnected and separated by other Native American students because she did not live on the reservation, was heart breaking. These young Native American students sitting on a stage talking about their experience left a feeling of loss that Native American students in public schools were suffering as a minority in ways that were not being recognized. My story is unique to me, but it is not uncommon. Failure to recognize how different groups of Native American students struggle culturally is a problem that impacts mental health, academic performance, and the futures of those students. Homogenous methods of teaching science will not bring these students around to Western methods of thinking, it will segregate them.

Spiderwebs in the Classroom

Being assimilated to Western culture, trained as a scientist, working as a science teacher, and trying to do scientific research to improve science teaching methods may have been a problematic and entangled combination in my research. Too much Western perspective and little to no Indigenous perspectives could only exasperate the issues I was trying to resolve. As a science person, I wanted to use science to solve the perceived problem of Native American students not liking science. As a science teacher I wanted to find ways to help Native American students enjoy science class. But Native American students do not feel connected to Western

science in the way I thought. Changing lessons to help Indigenous students feel included was not necessarily the full answer, but maybe there would be additional solutions that matter related to connecting science education to the needs of Indigenous students and their communities.

I had hoped being a science teacher was going to help me find a solution to science curricula alienating Indigenous students. A great deal of the research done on Native American peoples' views of science has been done so anthropologically. These studies do not necessarily take into consideration educational theories on curriculum. In most cases Native American students are asked to leave behind their traditional concepts of the world (Mack, et al, 2012). Students report challenges in balancing their traditional culture and academic culture (Sanchez, etal, 2016). The conclusion of these articles seems to be that it is this conflict between the traditional views of the student and what is being taught that leads to problems in comprehension and later performance. Ali, et al, (2014) says that "Indigenous minorities such as American Indian students do not appear to accommodate to the dominant culture and conform to the prescriptions needed to be successful at education" (p. 124). Studies attempting to better understand this cultural pattern on Native American students suggest that cultural differences may be to blame for educational difficulties faced by Native American students (Ali, et al, 2014). This kind of data helped me construct my early research model but does little now to help me find ways for Indigenous students to connect with Western science as it is taught in the classroom. It seems that my thinking was just one more way to try to change Indigenous students, to Westernize them, to assimilate them. It would seem more logical now to consider ways to change the curriculum to meet the needs of Indigenous students, rather than change it to draw them in.

This is probably the best point to describe what I have learned from spiderwebs. One of my favorite activities to destress, and maybe recenter on Indigenous perspectives, is watching the events of my backyard. Standing in *tti wítta* (my home) and looking out the window may be a way to recenter on Indigenous perspectives, or at the very least calming. There are woods and fields behind *tti wítta*, and a fence that separates my yard. There are chickens in the backyard to watch, birds visiting the neighbor's feeders, and lots of *sį́ka* (squirrels). The *moį́kką* (spider) comes in the fall. Large spiders, *moį́kką tanka*, build beautiful webs in the night that remain in the morning sun, glistening with dew. The webs are circular. I wondered one morning, looking at a web, if there was a connection with swirls. The webs are nets, but not like the square nets people make. Did *moį́kką* have something to teach me? It was not the circular pattern of the web that taught me something. It was the nature of the web. The cleaver design to catch food. Not unlike the nets people use. The connection I made with the web was to the science curriculum I hoped to change. Making Western versions of science in the classroom more appealing to ensnare the curiosity of the Indigenous students was deadly. Building a better web, a better net, only serves the spider. I need to consider ways to make the science lessons useful to the Native American students. One of the few people I was able to interview for this study resonated with Smith and talked of wanting to show Native American communities the value of some science, applying it their way, for their needs, under their standards.

Swirling or Blending?

Working to close this gap between Native American students and White students may involve creating curriculum that swirls traditional Western views on science with those of Native American groups. Blending brings things together to create a homogenous new product containing all aspects. Blending assimilates. In a Quapaw Swirl there are different lines that swirl

around each other, but do not blend together. It makes me think of a chocolate and vanilla soft server swirl. When I took my kids on a cruise one winter, there was a soft serve machine on the deck. You could make your own soft serve cone with chocolate, vanilla, or swirl. I am a fan of chocolate and do not normally get vanilla. But I love the look of a good soft serve swirl. I was rather proud of myself when I created a pretty good-looking swirl cone in front of my kids. When my youngest tried, the effect was more humorous. Swirling takes practice. If you blend chocolate and vanilla, you get a milkshake. If you swirl them, you get vanilla and chocolate on a cone.

Teaching models that attempt to combine different teaching styles to accommodate different learners differentiate instruction not content. As with any population, variations among students will support differentiated lessons. "Research indicates that curriculum or educational models that select one body of information to be presented to all students at a set time and at some forced rate cannot possibly accommodate all learners" (Pewewardy, 2002, p 53). While many studies have been found to improve Native American student performance, Pewewardy (2002) argues that "researchers have not begun to scratch the surface of the profound pedagogical traditions of American Indian/Alaska Native students." (p. 54). It seems to me that viewing Western science methods as being at odds with Native American Ways of Knowing simply establishes a duality that pits one against the other. Understanding both and finding connections would better help students find a place for Western science in their own lives.

Authors like Castagno and Brayboy (2008) refer to Tribal Critical Race Theory and present an assimilation model versus being culturally responsive. It appears that the effort is to force Native American students to alter their perceptions and learn using the prescribed education model. An alternative to this, The Culturally Responsive Education model recognizes,

respects, and uses students' identities and backgrounds as meaningful sources for creating optimal learning environment.

As a project for my graduate science education class, I took a lesson from the Montana *Indian Education for All* (https://opi.mt.gov) curriculum. The lesson is an effort to integrate Native American culture into the existing curriculum or attempt to present information from a Western viewpoint and a Native American viewpoint. The lesson I used for the project includes a history lesson on how Native Americans in the area hunted buffalo. This became the data source material for describing radiometric dating. The lesson is really about radiometric dating. The addition of the buffalo hunt may have benefits in teaching non-Indigenous students about another culture, but it does not address any conflict that may exist between the different approaches to science. This suggests that Pewewardy is correct that Native American pedagogy is not well understood (2012). It is also likely that, while Native American groups share many similarities, it is wrong to consider them one group. Doing so suggests that there is a one-size-fits-all solution to improving Native American student success in science classes.

Reflecting on my previous attempts to view Indigenous perspectives in science education helped me understand a misconception that I had. Integrating aspects of culture may not meet the needs of students. Curriculum guided by community elders and holistic views of the natural world could be a more appropriate alternative. What I wanted to measure, Native American student attitudes towards science, was not going to help me.

If I want to help Native American students find their way into STEM jobs, trying to help them enjoy science is not the answer. Assimilating Native American students to Western science methods will not help them or the communities they are a part of. I need to understand connections with Quapaw better to help Indigenous students connect better with science.

Native Americans in STEM

The existence of a disconnect between Native American students and current science curriculum seemed clear from my literature review. But I did not understand connections within Indigenous communities from an Indigenous perspective. Native Americans are underrepresented in science related careers. There are 5.2 million people that identify as Native American, that is 1.7% of the population (Sanchez et al, 2016). Stevens et al. (2016) suggests "data indicate that females and ethnic/race minority groups are underrepresented in the science and engineering workforce" (p. 947). And "data on Native Americans in STEM are not always reported separately from other minority groups" (p. 948). Hispanics and American Indian and Alaska natives are highly underrepresented in the STEM disciplines. While the literature demonstrates culture as a clear component, I did not think culture to be completely to blame. But there was no alternative explanation. This is due to the narrative created about Native people. Smith (2012) states that "Indigenous attempts to reclaim land, language, knowledge, and sovereignty have usually involved contested accounts of the past by colonizers and colonized" (p. 35). It may be hard to get support or find allies on research when the Indigenous narratives is counter to the one learned, and accepted, by most researchers. Not understanding connections as an Indigenous researcher meant I was only going to come to the same conclusion as other non-Indigenous researchers.

My inability to connect with other Native Americans in a meaningful way, during my research, was evident early on. I never talked with any Indigenous researchers about doing research as a Native American, but I did meet Native Americans doing research. When I was trying to find a group of students to interview, I was put in touch with a professor at the Kansas University. He is Native and a research scientist. My conversation with him was very positive

and inspiring. I was able to sit with someone that identified as a member of a Native American tribe, was doing science, teaching science, and very interested in getting Native American students into STEM fields. He was working on a project that created pathways that helped recruit Native American students into his program and support them to completing a degree. He even offered to put me in contact with a graduate student of his that has struggled with going through the program as a Native American with a cultural conflict with science.

In the end nothing came of the meeting. The professor became difficult to meet with and my own movement through my research was slow. But just knowing him revealed my own misconceptions about my research. I grew up around academia and this professor reminded me of every professor I had known. I was not yet understanding Indigenous researchers as Smith (2012) would describe them, "know and understand theory and research from our own perspectives and for our own purposes" (p. 41). It was devastating at the time to lose contact with someone I had hoped to supply me with much needed participants. My attempts to extract information rather than work with people was my Western science approach and not the Indigenous approach I should have been using. Smith states that "research is something that is done to people by outsiders" (p. xi). I was an outsider, acting like an outsider, and I was not going to get what I was looking for. The concept that participants in my study had something that I needed them to give me, the information on why they do not like science, was one of the biggest misunderstandings I needed to resolve. Smith points out that someone that identifies themselves as Indigenous will "work with, alongside and for communities" (p. 5). Looking back at my efforts, it is clear that I was not working with anyone or any community. My continued efforts to extract information for my own dissertation would continue to create barriers to

learning – my focus likely should have been on building relationships and engaging with the various communities and our collective goals.

Pewewardy (2002) argues that “the failure of programs aimed at reducing dropout rates and the inability to produce effective communication between majority and minority members are, in part, due to misconceptions and stereotypical notions about American Indian/Alaska Native students” (p. 54). It should be argued that Native Americans as a group do not represent a single culture, system of knowing, or pedagogy. But as a group they are consistent in low performance in science courses and low representation in science careers. The reasons may be similar.

The use of culture as a determining factor may include more than just a difference in views of the natural world. Long standing rifts between communities, stereotypes, stigma, and racism may play a role in determining why a group of Native American students underperform in science classes. And efforts to close this gap should include a better understanding of the unique group involved.

How I Was Taught Scientific Research

Educational research should be thought of as scientific research. That is what I learned and that is how I wrote it in my research proposal. It is important that this early writing represent the way I was trying to do things. This contrast with the autoethnography that eventually evolved demonstrates the approach that did not allow for the appropriate connections and relationships to evolve in a manner necessary to conduct research regarding Native American students and STEM. These are the methodological approaches I started with and ultimately did not find helpful.

The term science has been used to describe any methodological approach so often that the word tends to mean very little anymore. The traditions of scientific research are most obvious in physical sciences. Here quantitative, non-bias, researcher neutral methods have become the ruler that all other sciences have been measured against. But this type of research does not transfer well to other sciences. It may also be that it no longer suits all aspects of the field of physical science. Calling this type of methodology outdated would be a mistake and it is still a solid methodology not lost with the demise of positivism. However, after centuries of empirically testing the natural world, much of what remains cannot be directly observed and tested. The creation of models and ideas to describe something that cannot be seen directly puts physical science in the position of using methodologies more akin to sociology and education. But this has not stopped the criticism that qualitative methods are not credible. As Steven Krauss (2005) puts it “historically, data analysis in qualitative research was thought of as a mysterious metamorphosis” (p. 763). Kenneth Howe makes several arguments to put aside the debate of qualitative versus quantitative and get on with research. While the two methods may be arguably incompatible, quantitative should not be placing other methods on the defense. This devalues the research (Howe, 1992). If pragmatism allows for more valid research, then it should be argued that finding the methodology that best suits the research should be the most effective way of doing research. The ultimate conclusion of these arguments kept me bound to research models that still attempted to emulate the quantitative research models I was trained in, taught students, and was most comfortable with.

While education has been around longer than recorded history, educational research has not (Lagemann, 1997). But even in its earliest forms, the division of quantitative and qualitative researchers was apparent. This should not mean that a war between these two methodologies

needs to continue. Taking sides with Dewey or Thorndike will not give final validity to educational research as a field of study, nor bring an end to the debate. It may be that conforming to just one methodology could inhibit research. Spending more time with Smith (2012) and Whitinui (2014) could have given me the confidence I needed to break with more traditional models and embrace autoethnography from the start.

My efforts at beginning points in my writing were to demonstrate that I really wanted to use qualitative methods and recognized there would be resistance to "fuzzy studies." I can also say at this point that some of the writing seemed forced and did not reflect myself as a writer or a researcher. This just was not me. Examining my struggles with bias during my research proposal should confirm that I was already demonstrating why autoethnography is a better fit for me and my research writing.

I originally wrote in my proposal that choosing the best methodology for research brings about questions of ethics, values, and personal choices. If a researcher is more comfortable with a particular methodology, do they tend to choose research that uses their preferred method? Or similarly do they see research in terms of their preferred method? Is it possible to be neutral in choosing the best methodology for research? And should a researcher be neutral? Traditional methods of scientific research place high value on being neutral and nonbiased. Howe (1992) suggests that even in physical science it is not possible to be wholly neutral. Even if Howe is incorrect, the question of doubt does exist in physical and social sciences. If all scientific research is to be placed in question, can anything be thought of as true? It is clear that I struggled with my chosen methodology. The narrative models I was looking at were not a perfect fit and I was trying to shoehorn my ideas of research into them.

I would argue that even the most traditional view of scientific research places all research findings in doubt. Something is true only as long as no one has shown it to be otherwise. This type of research validity cannot be a cornerstone for arguments against empirical methodology superiority. Science relies on consensus. Research is valid when there is a consensus within the community. So, values and personal views effect research. And it would seem that a neutral approach would limit this influence. Researchers have personal beliefs, preferences in methodology, and make choices on research based on their own opinions. Recognizing these as places where bias may exist will allow for a researcher to make careful judgments to minimize bias.

Reflecting on my early writing shows the stark difference between writing styles and also my approach to conveying information. As I have believed all along, stories are the source of information I wanted to work with. Stories should be shared as stories. Showing how something impacts the individual or the community works better for me than telling. Researching my own story has turned out to be extremely beneficial in understanding how I position myself as a researcher.

Research with Indigenous Peoples: Understanding my Insider-Outsider Positionality

Research with Indigenous peoples in still justified by the ends rather than the means (Smith, 2012). While approaching this research with a sensitivity and respect for personal stories is commendable, it does not do enough to treat this research properly for Indigenous peoples. Linda Tuhiwai Smith has been quoted a lot in this dissertation for many reasons. I identify with her as someone with Indigenous heritage that grew up in a Western household by parents involved with Western research. But it is Smith's perspectives on Indigenous researchers doing research on Indigenous peoples that is important here. Smith discusses insiders vs. outsiders

when doing research (2012). I am an outsider. Despite my affiliation with a tribe and my involvement with the Quapaw Nation's cultural and governmental activities, I am an outsider to other Native American tribes and Indigenous groups. Research in Native American communities has a long and often painful history. Therefore, any kind of research "stirs up silence" (Smith, 2012, p.1). If I were to research my own tribe, I might be faced with what Smith describes as frustrating. I would be judged on my family background, status, politics, age, gender, religion as well as my perceived technical abilities (2012). As an outsider, I still position myself as a quasi-insider being a recently reconnected citizen of the Quapaw Nation as I come to understand my lineage on my father's side through the White Elk clan. From this position I am an active learner in the history and current culture of the Quapaw people, while I am simultaneously a victim of colonization, and an Indigenous researcher in training. My writing should reflect Smith's ideals that it come from "an ethical and respectful approach" (p. 16), and I have been trying to make these internal tensions visible through this autoethnography. Smith (2012) points out when talking about Indigenous methods and decolonization that:

> Methods of research, the theories that inform them, the questions which they generate and the writing styles they employ all become significant acts which need to be considered carefully and critically before being applied. In other words, they need to be decolonized. Decolonization, however, does not mean and has not meant a total rejection all theory or research or Western knowledge. (p. 41)

With this research being done by a Native American, with Native Americans, and about Native Americans; any methods or framing created by Native Americans would be best. Native American researchers should, as Smith (2012) puts it, "know and understand research from our own perspectives and for our own purposes" (p. 41). Carolyn Ellis (2004) points out that

"Indigenous ethnographies are written by researchers who share a history of colonialism or economic subordination, including subjugation by ethnographers who have made them subjects of their work" (p. 46). I have demonstrated the impact that colonialism has had on my upbringing, and on my research endeavors. The trauma caused by my removal and separation from my Quapaw family impacted my ability to connect with my research in a meaningful way, but even more than that, it has been confusing to interrogate my insider-outsider hyphen as someone trying to do research with Indigenous peoples.

Fortunately, I had been turned on to Tribal Critical Race Theory to frame my research. Smith speaks of the role colonialism plays in shaping the current state of Indigenous people. One aspect of Critical Race Theory is that colonialism is a normal part of American culture, and that it influences laws. Laws serve a dual role to help the minority race but to also assert the dominance of those in power (Smith, 2012). My feeling at the time was that by framing my research around the values and power of curriculum standards would demonstrate the impact of colonialism and race conflict. While it was important that I was using Tribal Critical Race Theory, I still was not positioned appropriately on the insider-outsider hyphen as an Indigenous researcher. Using Tribal Critical Race Theory to look back at my own research attempt is a valuable start to see where colonialism impacted my efforts.

Brayboy's tenets resonated with me before Smith did. The systemic colonialism was becoming more obvious to me. My children were navigating their own way through life. Their public education was not matching the stories we knew to be true of Quapaw and other tribes. But without doing research from the perspective of an Indigenous person, I was simply going to be another Western researcher attempting to convey the stories of Indigenous peoples. I approached the research as if I did not understand stories. I decided that stories told by Native

American students should be examined through a Tribal Critical Race Theory frame. This would ensure that aspects of colonialism, White supremacy, culture, knowledge, power, assimilation, beliefs, traditions, customs, adaptation, and stories as theory are identified and examined. That did not mean I would understand them. I assumed the stories may contain elements of stereotypes that impact the lives of Indigenous peoples. I also wondered if the stories told may also defy stereotype and show the life of people not often imagined by non-Indigenous people. Would hearing the stories of other native students give me a window into their tribes to see the things I was seeing in my tribe for the first time? Would I see a place that is devoid of ways to answer questions, a place without science? Or would I see other ways to accomplish the same things that science does in Western culture? Reflecting on these questions means this still seems like the attitude of an outsider.

When I look at how I wanted to interpret the stories, I see that I was fully entrenched into Western perspectives by this time. The process of creating a research study that followed a particular research model slowly turned anything that resembled the sharing of meaningful stories into the extraction of information by dissection. I believed that I needed a way to describe the stories as data. There was worry that calling stories data was not enough. I would need to back that up with the work of others. These others, of course, were not going to be Indigenous researchers and would give me more problems I had yet to realize. The data collected from the interviews would essentially be narratives. Brayboy considers Native American stories as data and these narratives would be stories. I found the writings for Catherine Kohler Riessman (2003) who concludes that narratives represent ways of knowing and communicating. She focuses on narratives as personal experience with research value. But she also notes that narratives require interpretation when they are used as data. How to position myself, I thought, depended in part on

what approach I wanted to take toward analysis. Riessman defines several types of narrative analysis. This method was a great find for me.

Considering some of Riessman's models helped define the direction for my study. Riessman describes the Thematic analysis as a researcher collecting many stories. The focus is to find common thematic elements to generate a general story. But Reissman warns that this method focuses on what is told and does not take into consideration how the information is shared. Institutional and cultural discourses are not studied (Reissman, 2003). Brayboy points out that colonialism is endemic for Native Americans (2005). Such a method of research would ignore what is probably a serious consideration. This form of analysis also requires a large sampling and tends to ignore outlining information or data that does not fit with the larger story or theory. This clearly was not what I was looking for. I needed small samples. I was not going to find a large population to study. I already knew that. Even though it would have worked better to become acquainted with a single tribe and worked with them to find a common ground to research from. It just seemed too complicated at the time.

Reissman's structural analysis works for small groups and longer narratives made it seem a possibility for my study. The study was intended to have Native American students share freely their thoughts, feelings and experiences with learning science in a traditional setting. As I started to apply Brayboy's tenets, I began to see how Western research methods did not match up. This would have made more sense to me if I had paid closer attention to Smith (2012), "research of this nature on Indigenous peoples is still justified by the ends rather than the means" and "know and understand theory and research from our own perspectives and for our own purposes" (p. 26). I was trying to extract information. I wanted to contextualize the meaning of stories using the Western perspective I was raised with and most comfortable with.

Brayboy was helping me realize the importance of colonization. I realized that Reissman's thematic analysis and structural analysis were less appealing from a traditional research perspective, but maybe I needed to dig deeper into my philosophical foundations and recognize Native American cultures, history, and ongoing exposure to imperialism. Maybe I was using Brayboy as a methodological tool without the direct lived experiences, relationships, and connections as an insider that would help me appropriately bring the right tools together for the right purposes. At the same time, I can acknowledge that colonialism and assimilation created that disconnect.

Interactional analysis, as described by Reissman, is co-constructed. The researcher and those being interviewed create a narrative together (Reissman, 2004). These are stories of life and can include interactions between many participants and nonverbal "the unspoken" communication. I saw this as a conversation, rather than an interview. It should be able to recognize culture, history, and institutions. But Reissman warns that transcripts may be difficult due to nonverbal information that needs to be included and the co-construction nature of the interview process. So, while this difficult nature needs to be considered, it must be recognized that this method was, at the time, the best way to meet the needs of the study as I saw it then. I would view the interview as a story. And maybe on the surface it looks like what I have been talking about. But it still led to a series of questions in a formal setting that was not a conversation between two people. Furthermore, and possibly my most important discovery: My positionality as a card-carrying outsider seeking reconnection as a quasi-insider, along with the assimilationist foundation of lived experiences informing my research, had a disruptive ripple effect I am still processing. To that point, in the present I have discovered the more I engage with

my Quapaw family and community along with Indigenous academics and educational advocates, the more clear things become.

Chapter 5 Swirling Outward – An Alternative to Moving Forward

Writing, reflecting, and rewriting has been an important part in understanding the benefits of this research study. My goal of improving public education in science classes for Indigenous students has not changed. What I did not understand when I started the research was that I needed to know more about myself as an Indigenous person and my relationship to the Quapaw community. Conveying what I learned, so far in this journey to reconnect with the Quapaw community, now presents itself with a challenge. When I first read Smith (2012) make the statement that she had written a book about Indigenous research for Indigenous researchers, I did not understand that it meant the book was written to help everyone understand Indigenous research. I must now ask myself; can I write this dissertation to help non-Indigenous peoples understand my journey or simply write it for Indigenous peoples with similar experiences and challenges? Do I believe that I can write so that any audience can understand what I have learned, so far? At this time, I can only try. I find myself in an awkward space where answers simply reveal more uncertainty. It is difficult to describe with confidence what I have learned when I realize how much I did not know and still need to know. While my experiences are similar to the experiences of some people, it is also unique. The stereotypes that create images of Native Americans for much of the population run counter to what I represent as a pale-skinned Quapaw with few traditional connections. My girlfriend in college points this out very well when she felt it was possible for me to stop being a Native. But the same is true of those Indigenous peoples that have strong traditional ties to their community. Neither of these groups appear to fully understand my specific version of entanglement with ongoing processes of settler-

colonialism, as I wonder around in this state of being in-between with a lot of questions and curiosities. My experience is best situated to break down stereotypes and also help those that have similar experiences, and to help bring some understanding to the various insider-outsider dynamics that come with my lived experiences.

Connecting to Swirls

When my family attended the Quapaw burial, there were certain parts of the ceremony that were different from all the funerals I had been to in my life. My cousin, presiding over the burial rites, felt it necessary to explain that he would be using the Quapaw language. He was concerned we would think he had lost his mind and started speaking in tongues. He also wanted us to know that the tobacco was part of the ceremony and that he did not smoke. Quapaw have a connection to these parts of the burial ceremony that are part of a lived experience and not completely conveyed when simply translated into English and written down. As a writer, I do the best I can to describe something I understand. Maybe, in the end, all I can do is hope that this autoethnography has allowed me to begin to resolve some of the entanglements of my life and teaching. Perhaps it can also help someone with a similar challenge. Smith (2012) warns that “if we write without thinking critically about our writing, it can be dangerous” (p. 37). Engaging the same style of writing suggested to me at the onset of this project only reinforces the methods that continue to silence and render Indigenous writers invisible. Smith (2012) points out much of the destruction to Indigenous communities that was brought on by colonialism. Indigenous methods of research need to be “from our own perspectives and for our own purposes” (p. 41). And much of that purpose is healing. If this project has served to heal in some way, then it has done its job.

This autoethnography has brought to light the importance of connections. Understanding myself as an Indigenous researcher has helped to clarify my approach to doing research. It is not

an easy path, or a short one. It is a messy path. Dr. Galindo, as an Indigenous researcher, spoke of walking in two worlds. But Dr. Pewewardy (2018) states that "I do not live or walk in two worlds. Rather, I exist in one world only yet experience life and see the world through many cultural lens" (p.40). Bishop (2020) suggests that Indigenous researchers are encouraged and even expected to walk in two worlds. I have been asked if I walk in two worlds or if I even should. I do not have an answer to that yet. If Dr. Galindo and Dr. Pewewardy have found different paths or interpretations that work for them, then I am comfortable that I will someday be more comfortable answering that question. Connecting to my community and with our lands, in a deep yet not overly romanticized way, is a step I am still figuring out how to take.

Pewewardy, Lees and Clark-Shim (2018) have developed the "Transformational Indigenous Praxis Model (TIPM) to promote critical awareness and cultural consciousness among educators (p.38). There are four stages that form a critical Indigenous educational curriculum model that helps educators understand various layers of critical awareness of Indigenous consciousness for the purpose of social equity. He and his colleagues describe them as:

Transformational Indigenous Praxis Model (TIPM)

Stage 1 Contributions
- captive or colonized mind
- unaware of unconscious or significant cultural issues in society
- unreflective thinker
- challenged Eurocentric thinker
- assimilationist behavior
- actions are ethnic cheerleading
- race talk is happy talk
- dysconscious racism
- commodification of mindfulness
- rediscovery and recovery (decolonization novice learner)

Stage 2 Additive
- approach to deconstruct and change structural framework

- burst of critical awareness
- tries to decolonize oneself but without regular practice
- still embraces mechanical Eurocentric thinking with fixed structures that lack critical attributes of human living systems
- morning (decolonization engagement process)

Stage 3 Transformation

- approach to liberatory pedagogy;
- regularly practices of decolonization, mindfulness and advances practices accordingly
- begins to mentor learners also desiring to decolonize their minds
- dreamy (decolonization practice)

Stage 4 Cultural and Social Justice Action

- approach to Indigenous pathways and freedom
- intellectual creativity and genius virtues have become second nature
- teacher of teachers
- protector of sacred knowledge
- engages insurgent research
- commitment and action (decolonization critically conscious)

This model puts in perspective where I was as a teacher and researcher when I began my research, where I am now, and where I still need to be. I definitely began at Stage 1. My colonized mind was unaware of significant cultural issues in society. Being on the Quapaw tribal list did not make me Quapaw, at least in those deeper ways. The realizations of cultural disconnects in the public schools helped me realize the importance of culture in education, as well as how education has shaped my Eurocentric understanding of the world. I would not have guessed that I was that unaware and disconnected, but my connections to my Quapaw family and community have since helped me to become more conscious of my thoughts and actions, and my positionality within my specific Indigenous contexts of belonging, insidership, and outsidership.

I was listening to the radio one day coming home from work and heard a song from the late 1980s, a time when I was teenager. The song was about the loss of family farms during the recession, and I remember the attention being given to farmers at the time. What struck me now, was how I reacted so quickly to the song with new perspectives. Lyrics about the tragedy of

losing land that had been in the family for generations didn't resonate with me the way I am sure the artist hoped. I became angry. How dare they complain about their stolen land being taken. How could I empathize with them when the land they were talking about was land lost – no, stolen - by Native American families? How can there be a national conversation about farmers losing family lands but not Indigenous peoples losing their lands? These perspectives did not exist inside of me when I was a teenager. This intergenerational trauma felt from the loss of tribal lands, destruction of cultures, and loss of language reverberates through the Quapaw family. My children feel it. These feelings are hard to reconcile, and I don't fully understand the trauma. I now feel a strong need to visit the lands in Arkansas that I know where once the lands of my family and explore what it means to heal by connecting to those lands. For *ki ho ta* to work I need to include historic trauma in my healing, and understand it's ongoing impact on the Quapaw community.

While I might be able to argue an emergence out of Stage 1 at the beginning of the dissertation, I couldn't see myself in the contexts provided in Stage 2. But there is a lot of work to be done yet. Reflecting on the model, I still see myself in Stage 2. Decolonization is something I work towards but do not practice regularly, yet. It has become clear that this is not a straightforward or linear process. Smith (2012) said it was a messy process to decolonize and I am actively working through that mess. This dissertation has become a crucial beginning step in recognizing my positionality as it relates to Indigenous work in education and research, and exploring next steps while planning a path for potential next steps for educational research and healing.

The act of writing the dissertation consistently challenges me to break from the familiar, and safe, path of mechanical Eurocentric thinking with fixed structures that lack critical

attributes of human living systems. As I re-read some of my early writing in the dissertation process, I realize how straight and organized my writing was to the point of being sterile and unattached to Indigenous perspectives. Just like mowing straight paths in the lawn, I force myself to change direction. Large portions of the original research proposal that were to be part of this dissertation were eventually deleted. A lot of work was lost as part of the learning process and part of the healing process. The presence of old parts in the dissertation is still obvious as the writing style and perspectives change in different sections. But I feel in some way that those sections show how moving from a familiar research project to the stories of this autoethnography resonate with what has been learned. Stories that swirl around the point I am making connect the concepts and hold things together in a way I previously couldn't articulate. The stories that weave their way in and through the dissertation connect it to me, to my family, and to the Quapaw.

From this point it is important to remind myself that I started out telling the story of connecting with my Quapaw family alongside the story of doing research with Indigenous students. These were separate events that began to connect with each other as I realized being a successful teacher and researcher depended on the many connections in my life. The stories in this dissertation connect and heal.

When considering where I go from here in relation to the TIPM, it may be easier to apply those goals to teaching, researching, and connecting with Quapaw as separate conversations. To keep them attached to each other and find a way to speak of my ongoing efforts to move into Stage 3 and 4 of the TIPM, I will use the Quapaw Swirl to guide my efforts. The Swirl will help me as a teacher in public schools to incorporate the promotion of critical awareness and cultural consciousness among educators into my curriculum. The Swirl will bring efforts to recenter my

research with Indigenous perspectives into a constant revisiting of connections and humility, and to find out what that means through the process.

Teacher Swirls

As a teacher, recentering the dominant Eurocentric science curricula that I work with daily is no easy task. Even if I can insert various perspectives within the curricular standards and materials I have to work with, this would only be a step in the direction I am aiming to move. I do see better the conflicts and tensions that exist with Indigenous perspectives. The subject of imperialism and its use of science to justify colonialism should become part of my teaching. Helping students find connections that help them understand how science impacts their own lives and their history will help me to better understand my own two worlds.

Working to redefine some of my spaces with Indigenous perspectives gives me places I can go to recenter. Without those escapes, the constant barrage of Western methods I have been a part of can begin to cloud my thoughts. Smith (2012) reminds me that “decolonization, however, does not mean and has not meant a total rejection of all theory or research or Western knowledge. Rather, it is about centering our concerns and world views” (p. 41). These constant steps back are necessary. Without recentering, I just start going back to teaching science like I always have, without Indigenous perspectives. Finding those connections that help me connect and grow my relationship with the Quapaw community can be difficult. I rely heavily, right now, on the few places I can go to connect and return to the center of the swirl. The Quapaw powwow was delayed this year until the middle of autumn. I felt that loss. I went online to social communities created to bring Indigenous peoples together with the delays and cancelations of so many powwows. I needed to hear that drum, and the singing, even if I’m still learning about those songs and Quapaw ways. I miss the people and food. Being surrounded during a powwow

helps me to recenter. Watching the dancers move around the drum connects me to those communal moments of camaraderie and peaks my curiosities' potential connections to the swirls. The drum has a power that I can feel, even I don't fully understand it yet. The more I engage with my family and community in responsible ways over time, the more I'll understand. But in this moment, seeing the faces of my Quapaw family brings me home.

My family was devastated when the annual powwow and Grand Council meeting were delayed in response to the COVID19 pandemic. When my kids were younger, they relished the stay in the casino hotel and swimming in the pool. Now those activities seemed of little consequence to the young adults that wanted more than anything to watch the dancers, listen to the drum, hear the singers, and connect with our Quapaw family. Those connections seem more important than ever as I work to bring together my teaching with a clearer picture of who I am. Spending more time with my Quapaw family and community will give me the connections I need to spend more time engaging with the concepts of decolonization and elevating my critical consciousness.

My school offers no place where I feel safe to express those aspects of my life that are Quapaw. I feel sad when staff at my school express their opinion that we, as a staff, are a great family. This perception they have only lasts as long as they feel everyone in the room is operating under the same point of view. It is not a liberal versus conservative kind of thing that has become so pervasive lately. It is more of a midwestern upbringing they seem to feel everyone in the room has experienced and operates by. I see it because I was raised with what they all believe brings us together. My pale skin allows me to camouflage my growing critical reflexivity. But they do not seem interested in the things that separate me from them.

During a faculty meeting about Black History month, some in the room shared their concerns that if we recognize a special time of year for Black students then we will need to do the same for Asian students, Hispanic students, and yes – Native American students. With me sitting in the room, they ignored what they all knew, that I was Native American. They do not see me that way – and as one can see through this autoethnography I've had a hard time seeing myself that way over the span of my life. I have not been successful in helping them to recognize the differences they need to embrace, to help all their students feel welcome.

Moments like the faculty meeting do so much silent harm. I find it difficult to talk with the faculty members that have expressed a lack of understanding or sensitivity to issues related to cultural responsiveness or honoring diversity, particularly as I sit here reflecting on how assimilation via education has created confusion and internal tensions in my life. I communicate with them less and I certainly do not think of them as family, and it hurts the professional relationship and working conditions. The family atmosphere some staff talk about does not exist for me. I am still alone. For a long time, I felt I was the only person in the building that connected to a community other than the White midwestern community of the rest of the staff. Only recently has someone else confided in me that they are Hispanic but do not reveal this since they do not look Hispanic. These are the issues that destroy our ability to reach out to students of minorities and include them. It only strengthens the narrative that they and I are others.

It seems at this point that the best way to handle teaching is to look at the next stage of the TIPM for a direction. I need to explore how to move beyond the additive stage 2 and into the transformation stage 3. I could probably write a whole chapter if not a second dissertation on how I teach science now and how that needs to change. But it is probably sufficive to say that I have a good understanding of science curriculum as it is taught in the United States right now

and very little knowledge of how I need to teach science from an Indigenous point of view. I need to attend more lectures, symposiums, and workshops, and sustain my engagement through ongoing readings, but also listening to elders and connecting with other Natives in the field of education. I could probably benefit from teaching a few classes as I learn more. Decolonization needs to be a constant focus. Identifying those places in my classroom, tribe, and family where colonialism still resides and learning ways to decolonize those spaces. I need to practice decolonization, and in doing so I need to more deeply figure out what that actually means as I continue to peel back it's layers.

Researcher Swirls

This dissertation began as a process to help me become a better teacher. It also exposed the limits of me as a researcher. Working from the beginning of the research study there would need to be changes at each level for someone like myself hoping to do research with Indigenous peoples. A beginning step would be developing a deeper and more complete understanding of who Indigenous peoples are, and the need to understand to be engaged with the specific communities you intend to do research with – and not engage them for the sake of only looking to extract knowledge. Also, I originally did not select anyone to be on my committee that had worked with Indigenous communities to help me understand how to navigate these contexts. Being a card-carrying Quapaw was not enough to understand the levels of distrust that exists between Native people and Western forms of research. The journey to connect more with my Quapaw family and community was happening at the same time as my research, and I was experiencing different types of interactions – more fulfilling ones. Those connections help me understand better now what I did not know in the beginning. There are ways to connect with Indigenous peoples to do research. Talking directly to young Indigenous undergraduates would

get me some interviews but not the kind I wanted. The notion that I would extract information from my participants to better understand why they did not like science was not in line with the conversations I said I was going to have. The approach that ended up happening was the interviewer/participant model I was taught in class and not the casual conversations I had envisioned. But there was also plenty about talking with Indigenous peoples I did not understand. Those interviews could have benefited from coordination through connections with family and elders, or people whom it would be culturally appropriate for me to bring gifts to and seek advice. I also would need a better understanding of Indigenous knowledges. Taking stories and extracting knowledge is not acceptable. There is a different path and, I would guess, the reason that Haskell's IRB denied my request to interview Haskell students. A conversation with those board members would be a starting place to better understanding research in those communities. Along those same ideas is another issue to overcome, the distrust of Western methods of research. Within this is the concepts of colonialism. I needed to understand colonialism and the impact it has, both now and historically, on Indigenous communities. The distrust I thought was attributed to different ways of learning has more to do with a long history of trauma due to colonialism. Just these things alone were enough to make my research short sighted and inappropriate to complete. I did not connect enough with my own Quapaw community so I couldn't connect with other communities. I had no one on my committee to help me make connections. I did not understand Native ways of knowing or the impact that colonialism has on Indigenous perceptions of Western research.

The next step is to bring the new things I have learned together with the things I already knew. In the past, this simply meant adding to my knowledge, building. But now I am working with two separate communities. The Indigenous communities and the Western model are not the

same. I can bring them together, swirl them into one understanding, but the parts are still different. The Quapaw Swirl used in some places has two colored lines swirled together side by side. They exist in the same place and form a single image of a swirl, but they are two separate marks. Smith (2012) admits that while simultaneously living in one world we strive to oppose it and states that "at some points there is, there has to be, dialogue across the boundaries of oppositions" (p. 40). As I continue to examine ways to do research, I will need to work across colonized and decolonized methodologies. Swirls can help me navigate the differences between them, and where they can work together.

Imbeau Heatwole Swirls

My Quapaw family name is Imbeau. My adopted name is Heatwole. This dissertation has been an effort to examine the parts of my education, my career, and my life to find connections and begin healing. I stated early on that I would need to reconcile the different parts of my life. The solid White American education and upbringing I was given would need to find a way to live with the newly emerging Quapaw connections I am forging. It is my belief that there is value in this effort. Not just value for myself but value for my family.

Some of this *ki ho ta,* healing, starts with names. The connections I am making with my Quapaw family are strengthening. But I cannot leave one family for another. I now realize that I will always be part White and never fully Quapaw. Just as I could never leave the Quapaw part of me, I cannot leave the White part of me. But the Quapaw will grow. The Quapaw Swirl will help bring both of these worlds into one place. The Imbeau and the Heatwole will have to exist together. The efforts of this autoethnography have shown that connecting the two is possible. It is also necessary. And perhaps, the necessity to bring these two parts of my identity together will lead to a better understanding of both.

The most recent efforts I have made in strengthening my Quapaw connections have come from trying to create decolonized spaces. My kids ask for these, and I try to provide them based on my current understandings. They already see the value in making sure their Quapaw connections do not lose out to larger pressures of colonized norms. I certainly do not want this to look like a Heatwole versus Imbeau battle. But the Heatwole name has it easy. Step outside, go shopping, go to school, or visit Disney World. These activities are what the Heatwole family does. At least the Heatwole family members at the house I live in. So, what should the Imbeau family members do? What can connect us to the Quapaw community?

Imbeau as a family name has a dual role. My Imbeau brother and sister have their own family culture they grew up with away from the Quapaw. Jim spent more time with them and they both knew our Imbeau grandparents more. But they do not know much more about the Quapaw family than I do. My brother and I work together to connect with the Imbeau family and the Quapaw. Some of our time together is spent with the Quapaw community, like the annual powwow and Grand Council meeting. Other times are just family, like celebrating a birthday or having a cookout.

The overlap of Quapaw and Imbeau grows. My brother and sister both brought their families with them to the last powwow. For one evening my grandfather's decedents were sitting around the circle of the powwow grounds listening to the singers and the drum, watching the dancers, and eating frybread. It was a happy time. Far from the nervousness of my first Quapaw powwow when my kids and I only joined in on the open round dance anyone could join. My kids and I figured if we messed up the dancing, we would just look like typical White visitors. But the unplanned Imbeau reunion was different. We were with family. The experience connected us.

We were all there. All the Imbeau. Sometimes Imbeau means *Ogahpa* (Quapaw), and sometimes it means *wahą́* (family). The Imbeau family name has a bigger challenge in *tti wítta* (my house).

There is very little in *tti wítta* to connect with Imbeau, to Quapaw. Every room in the Heatwole house is a stereotype of what an American home ought to look like. Even our newly remodeled kitchen has granite countertops and white cabinets. There used to be some Native American artwork in the kitchen that I purchased from an artist at the Haskell powwow, but it has been replaced by a cuckoo clock. I like the clock a lot, but it displaced one of the few things I look at that helps me connect to something outside of being Heatwole. It is like the days at the university in Oshkosh when all I had was an enrollment card and a picture of my grandpa. The irony of a German clock displacing the Native American artwork does not go unnoticed. A few pieces of Native American artwork are mixed in with other decorations down the hallway or in the living room. We have a Pendleton blanket designed by a Quapaw artist with the family clans and Quapaw Swirl. Sometimes the blanket is out to see, but often it is folded out of sight. I find comfort in seeing Indigenous art in *tti wítta* and so do my children. However, in the end these are just objects. Connections to the Quapaw family are the real necessity and the challenge I face. I need to do more. My children need me to do more. There is not a space in the house I live in that we can recenter Indigenous perspectives while connecting and growing relationships with our Quapaw family.

Throughout this dissertation I have stressed connections. The lack of connections I had with the Quapaw community, my family, and other Indigenous peoples. Connections are important but how I view those connections is also important. The term connecting seems linear at times. In school we draw lines to connect things. But swirls are now equally important. Swirls

can connect too. Gravity holds the galaxy together in one gigantic swirl. All the objects in the Milky Way are connected to each other and swirl around space. Swirls connect.

The swirl I mow into the backyard lawn that helps me break my linear thinking must constantly be remade with each lawn mowing. Smudges that I make with my kids must be made often as they burn to clean the air. Everything I do needs to come back around to a question of how it connects me and my family to Quapaw. Recentering my spaces to connect with Indigenous ways means going back to the swirl, going back to revisit a space. Then taking the swirl to bring the Heatwole and Imbeau together. This is healing, this is *ki ho ta*. Not abandoning one thing for another but swirling them together to keep both.

References

Abrams, Marc D., et al. "A Ten-Year Record of Aboveground Biomass in a Kansas Tallgrass Prairie: Effects of Fire and Topographic Position." *American Journal of Botany*, vol. 73, no. 10, 1986, pp. 1509–1515.

Ali, Jinnat, et al. "Socially Oriented Motivational Goals and Academic Achievement: Similarities Between Native and Anglo Americans." *The Journal of Educational Research*, vol. 107, no. 2, 2014, pp. 123–37, doi:10.1080/00220671.2013.788988.

Bhattacharya, Kakali. "Diving Deep into Oppositional Beliefs." *Cultural Studies - Critical Methodologies*, vol. 15, no. 6, 2015, pp. 492–500, doi:10.1177/1532708615614019.

Bhattacharya, Kakali. *The Other : De / Colonizing Approaches to Qualitative Inquiry*. no. 2003, 2009, doi:10.1007/978-1-4020-9628-0.

Bhattacharya, Kakali, et al. "Effective Practices for Creating Transformative Informal Science Education Programs Grounded in Native Ways of Knowing." *Cultural Studies of Science Education*, vol. 7, no. 4, Routledge, 2012, pp. 49–70, doi:10.1007/s11422-011-9374-y.

Bhattacharya, Kakali, and Rachél Payne. "Mixing Mediums, Mixing Selves: Arts-Based Contemplative Approaches to Border Crossings." *International Journal of Qualitative Studies in Education*, vol. 29, no. 9, Oct. 2016, pp. 1100–17, doi:10.1080/09518398.2016.1201163.

Bishop, M. (2020). 'Don't tell me what to do' encountering colonialism in the academy and pushing back with Indigenous autoethnography. *International Journal of Qualitative Studies in Education*, 1–12. https://doi.org/10.1080/09518398.2020.1761475

Boylorn, R. M., and M. P. Orbe. *Critical Autoethnography: Intersecting Cultural Identities in Everyday Life*. Left Coast Press, 2013.

Brayboy, Bryan McKinley Jones. "Toward a Tribal Critical Race Theory in Education." *The Urban Review*, vol. 37, no. 5, 2005, pp. 425–46, doi:10.1007/s11256-005-0018-y.

Cajete, Gregory A. "Decolonizing Indigenous Education in a Twenty-First Century World." *For Indigenous Minds Only: A Decolonization Handbook*, School for Advanced Research Press, 2013, pp. 145–156.

Castagno, A. E., and B. M. J. Brayboy. "Culturally Responsive Schooling for Indigenous Youth: A Review of the Literature." *Review of Educational Research*, vol. 78, no. 4, 2008, pp. 941–93, doi:10.3102/0034654308323036.

Castagno, Angelina E. "'They Prepared Me to Be a Teacher, But Not a Culturally Responsive Navajo Teacher for Navajo Kids': A Tribal Critical Race Theory Analysis of an Indigenous Teacher Preparation Program." *Journal of American Indian Education*, vol. 51, no. 1, 2012, pp. 3–21, http://search.ebscohost.com/login.aspx?direct=true&db=eue&AN=74011079&site=ehost-live.

Castagno, Angelina E., and Stacey J. Lee. "Native Mascots and Ethnic Fraud in Higher Education: Using Tribal Critical Race Theory and the Interest Convergence Principle as an Analytic Tool." *Equity & Excellence in Education*, vol. 40, no. 1, 2007, pp. 3–13, doi:10.1080/10665680601057288.

Conn, D. R. "When Two Worlds Collide: Shared Experiences Of Educating Navajos Living Off The Reservation." *The Qualitative Report*, vol. 18, no. 49, 2013, pp. 1–16.

Denzin, Norman K., and Yvonna S. Lincoln. "The SAGE Handbook of Qualitative Research. Fifth Edition." *SAGE Publication*, 2018, doi:10.1007/s11229-017-1319-x.

Eketone, A. "Theoretical Underpinnings of Kaupapa Māori Directed Practice." *MAI Review*, vol. 1, no. 1, 2008, pp. 1–11.

Ellis, Carolyn. *The Ethnogrpahic I: A Methodological Novel about Autoethnography*. AltaMira Press, 2004.

Ellis, Carolyn, et al. "Autoethnography : An Overview Author (s): Carolyn Ellis , Tony E . Adams and Arthur P . Bochner Conventions and Institutions from a Historical Perspective / Konventionen Und Institutionen in Historischer Perspektive (2011), Pp . 273-290 Published By :" *Historical Social Research*, vol. 36, no. 4, 2011, pp. 273–90, https://www.jstor.org/stable/23032294.

Ellis, Carolyn, et al. "Autoethnography : An Overview Author (s): Carolyn Ellis , Tony E . Adams and Arthur P . Bochner Conventions and Institutions from a Historical Perspective / Konventionen Und Institutionen in Historischer Perspektive (2011), Pp . 273-290 Published By :" *Historical Social Research*, vol. 36, no. 4, 2015, pp. 273–90, https://www.jstor.org/stable/23032294.

Faircloth, Susan C., &Tippeconnic, III John W. (2012) *The Dropout. Graduation Rate Crisis Among American Indian and Alaska Native Students: Failure to Respond Places the Future of Native Peoples at Risk.* Los Angeles, CA: The Civil Rights Project/Proyecto Derechos Cviviles at UCSL; www.civilrightsproject.ucla.edu.

Flemming, Walter C. "Myths And Stereotypes About Native Americans." *The Phi Delta Kappan*, vol. 88, no. 3, 2006, pp. 213–17.

Hawkins, Jeffrey M. "The Pit Boss : A New Native American Stereotype ?" *Multicultural Education*, vol. 9, no. 4, 2002, pp. 15–17.

Hawkins, Jeffrey M. “Smoke Signals, Sitting Bulls, And Slot Machines: A New Stereotype Of Native Americans?” *Multicultural Perspectives*, vol. 7, no. 3, 2005, pp. 51–54.

Hayano, D. M. “Auto-Ethnography: Pardigms, Problems and Prospects.” Human Organizations.” *Human Organizations*, vol. 38, no. 1, 1979, pp. 99–104.

Howe, Kenneth R. “Getting over the Quantitative-Qualitative Debate.” *American Journal of Education*, vol. 100, no. 2, 1992, pp. 236–56.

Kitson, R., and J. Bowes. “Incorporating Indigenous Ways of Knowing in Early Education for Indigenous Children.” *Austalasian Journal of Early Childhood*, vol. 35, no. 4, 2010, pp. 81–89.

Krauss, Steven Eric. “Research Paradigms and Meaning Making: A Primer.” *The Qualitative Report*, vol. 10, no. 4, 2005, pp. 758–70.

Ladson-Billings, Gloria. *Critical Race Theory Perspectives on the Social Studies: The Profession, Policies, and Curriculum.* 2003.

Lagemann, Ellen Condliffe. “Contested Terrain: A History of Education Research in the United States, 1890-1990.” *Educational Researcher*, vol. 26, no. 9, 1997, pp. 5–17.

Letiecq, Bethany L., and Sandra J. Bailey. “Evaluating from the Outside: Conducting Cross-Cultural Evaluation Research on an American Indian Reservation.” *Evaluation Review*, vol. 28, no. 4, 2004, pp. 342–57, doi:10.1177/0193841X04265185.

Mack, Elizabeth, et al. “Effective Practices for Creating Transformative Informal Science Education Programs Grounded in Native Ways of Knowing.” *Cultural Studies of Science Education*, vol. 7, no. 1, 2012, pp. 49–70, doi:10.1007/s11422-011-9374-y.

Marshall, C., and G. B. Rossman. “Designing Qualitative Research. 6th Edition.” *Sage Publication*, 2016.

Merriam, Sharan B. “Qualitative Research: A Guide to Design and Implementation.” *The JosseyBass Higher and Adult Education Series*, vol. 2nd, 2009, p. 304, doi:10.1097/NCI.0b013e3181edd9b1.

Nelson-Barber, Sharon. “Bringing Native American Perspectives to American Mathematics and Science Teaching.” *Theory Into Practice*, vol. 34, no. 3, 1995, pp. 174–85.

Padgett, Gary. “A Critical Case Study of Selected U.S. History Textbooks from a Tribal Critical Race Theory Perspective.” *The Qualitative Report*, vol. 20, no. 3, 2015, p. 153, http://royalroads.summon.serialssolutions.com/2.0.0/link/0/eLvHCXMw1V07T8MwELagUxfEm_LSjaCqUWK3qTswVBUVYkJ9zJWJ7QqppFIbBv49d3Zeqgo7a6KcLH_nezh33zEmeBB2dmxCqGPbVYnlwqBKWR6JvowTqXmCAbyw1JxczSSpxhXunVPyb4EftsvxBSN0Ua5S0P1Gn7qRNxhgzoNpkPODfLdnaJ0p0t76ThPVJi4R.

Peshkin, Alan. “In Search of Subjectivity. One’s Own.” *Educational Researcher*, vol. 17, no. 7, 1988, pp. 17–21.

Pewewardy, Cornel. “Renaming Ourselves on Our Own Terms: Race, Tribal Nations, and Representation in Education.” *Indigenous Nations Studies Journal*, vol. 1, no. 1, 2000, pp. 11–28.

Pewewardy, Cornel. “Learning Styles of American Indian/Alaska Native Students: A Review of the Literature and Implications for Practice.” *Journal of American Indian Education*, vol. 41, no. 3, 2002, pp. 22–56, http://my.tru.ca/__shared/assets/Pewewardy_2002_Learning_styles_Aboriginal23616.pdf.

Pewewardy, et al. “The Transformational Indigenous Praxis Model: Stages For Developing Critical Consciousness in Indigenous Education.” *Wicazo Sa Review*, vol. 33, no. 1, 2018, p. 38, doi:10.5749/wicazosareview.33.1.0038.

R. James Ansley, and G. Allen Rasmussen. Managing Native Invasive Juniper Species Using Fire.” *Weed Technology*, vol. 19, no. 3, 2005, vol. 19, no. 3, 2005, pp. 517–522.

Rachels, J., and S. Rachels. *The Elements of Moral Philosophy*. 6th ed, McGraw Hill Higher Education, 2010.

Rich, Nancy. “Introduction: Why Link Indigenous Ways of Knowing with the Teaching of Environmental Studies and Sciences?” *Journal of Environmental Studies and Sciences*, vol. 2, no. 4, 2012, pp. 308–16, doi:10.1007/s13412-012-0098-4.

Richardson, and Pierre. “Writing: A Method of Inquiry.” *Sage Handbook of Qualitative Research. Fifth Edition*, 2018, pp. 1399–431.

Riessman, C. K. “Analysis of Personal Narratives.” *Handbook of Interview Research*, 2002, pp. 695–710, doi:10.4135/9781412973588.

Sabzalian, L., Tuck, E., Yang, K. (2019). Indigenous Children’s Survivance in Public Schools. New York: Routledge, https://doi.org/10.4324/9780429427503

Sánchez, John Paul, et al. “Balancing Two Cultures: American Indian/Alaska Native Medical Students’ Perceptions of Academic Medicine Careers.” *Journal of Community Health*, vol. 41, no. 4, 2016, pp. 871–80, doi:10.1007/s10900-016-0166-x.

Scheurich, James Joseph. *Research Method in the Postmodern*. Falmer Press, 1997, https://books.google.com/books?id=o9-DmMQeLh8C.

Shear, Sarah B., et al. “Manifesting Destiny: Re/Presentations of Indigenous Peoples in K-12 U.S. History Standards.” *Theory and Research in Social Education*, vol. 43, no. 1, 2015, pp. 68–101, doi:10.1080/00933104.2014.999849.

Shreve, Bradley. “The Promise of Higher Education.” *Tribal College Journal*, vol. 26, no. 3, 2015, pp. 18–22.

Simonds, Vanessa W., and Suzanne Christopher. “Adapting Western Research Methods to Indigenous Ways of Knowing.” *American Journal of Public Health*, vol. 103, no. 12, 2013, pp. 2185–92, doi:10.2105/AJPH.2012.301157.

Singh, Navin Kumar, and Jon Reyhner. “Indigenous Knowledge and Pedagogy for Indigenous Children.” *Honoring Our Children: Culturally Appropriate Approaches for Teaching Indigenous Students*, Northern Arizona University, 2013.

Smith, Linda Tuhiwai. *Decolonizing Methodologies: Research and Indigenous Peoples*. 2nd ed., Zed Books Ltd, 2012.

Stevens, Sally, et al. “Motivating Young Native American Students to Pursue STEM Learning Through a Culturally Relevant Science Program.” *Journal of Science Education and Technology*, vol. 25, no. 6, Dec. 2016, pp. 947–60, doi:10.1007/s10956-016-9629-1.

Tracy, Sarah J. “Qualitative Quality: Eight "Big-Tent" Criteria for Excellent Qualitative Research.” *Qualitative Inquiry*, vol. 16, no. 10, 2010, pp. 837–51, doi:10.1177/1077800410383121.

Warner, Connor K. “A Study of State Social Studies Standards for American Indian Education.” *Multicultural Perspectives*, vol. 17, no. 3, 2015, pp. 125–32, doi:10.1080/15210960.2015.1047930.

Whitinui, Paul. “Indigenous Autoethnography: Exploring, Engaging, and Experiencing ‘Self’ as a Native Method of Inquiry.” *Journal of Contemporary Ethnography*, vol. 43, no. 4, 2014, pp. 456–87, doi:10.1177/0891241613508148.

Williams, G. W. (2003). References on the American Indian use of fire in ecosystems. Washington D.C.: USDA Forest Service. Retrieved from https://prod.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_051334.pdf