

ONYX (*Oohoo 'aah, Na 'nitin Yee nooseel Xploria*):

A Proposal for an Innovative School for Navajo Children

by

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ABSTRACT

The purpose of this study was to describe a new school model for Dine (Navajo) learners where Dine students will experience how to apply knowledge and skills personally, meaningfully, and socially relevant to life situations through the medium of Dine language and culture maintenance. This study explored a new way to perpetuate Dine (Navajo) culture and language through a model referred to as M.A.T.S. (Mathematics, Arts, Technology, Science, the renaming of STEM and STEAM). *Oohoo'aah, Na'nitin Yee nooseel Xploria*, which translates to a Center for Learning, acquiring knowledge and growing through a Navajo approach to exploration) is a public charter school serving students in grades K-3. As a public charter school ONYX is to serve all of Jeddito Community, with 98% ratio of students qualifying for free and reduced lunch. ONYX will employ dedicated educators and community members with excellent work ethics who are committed to closing the achievement gap, while promoting a creative outlook on the world around them. Students will leave ONYX School with skills in Navajo Language and Culture with a foundation in M.A.T.S. ONYX School's educational program will be driven by a belief that all learning will be academically rigorous with a well-designed curriculum to students in becoming lifelong explorers of learning and productive members of society. This will allow ONYX to stay true to the mission to promote *K'e* (relationship in Navajo Culture), respect for self, others, and environment, most importantly to use natural/traditional scientific skills passed on through Navajo culture. In the learning environment, there will be constant and continuous communication among administrators, teachers, parents, and community leaders. This form of instruction is also transferable to learning how to read and write in Navajo. The

program will allow for students to use hands on approach with inquiry based learning with a foundation in Navajo traditional/scientific approach to learning.

I was brought into this world riding a white shell horse,
Embraced by the fire in a Hogan.
I was greeted by loving and
Kind words of *Shiyazhi* (my little one).
A *Kinyaa'aanii* girl
To carry on the lineage like
Many *Kinyaa'aanii* women before me.
I give thanks for the air I breath and
To shima, Nancita and father, Bowman for giving me life.

To *Shimasani* Katie Martin Duffy Naabaahii
The resiliency of a humble heart.
A nurturing soul and teachings
Beyond my years.
A true patriarch of a
Strong *Kinyaa'aanii* Woman.



To *Shicheii* John Naabaahii
To teaching all your children and grandchildren
The importance of education
And the importance of
Living *Iina*—Life
Being strong willed and
Determined.

To my children Kody and Xander
I love you with all I am
It is for you I continue
To strive and model
The meaning of *Iina*-Life as
My grandparents did for me.

To my husband Alexander Charlie
For your patience, love
And support
Through this
Journey.

To the *Naabaahii Kinyaa'aanii/Tabaahi's*
Aunties, Uncles, Sisters, Brothers,
Nieces, Nephews, Children, Grandchildren of
Gah To, Jadito, Arizona
Oohoo'aah, Na'nitin, Ya'at'eehigii
Bee shi yadahoola'
Ahehee'

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CHAPTER 1

OVERVIEW OF THE STUDY

The Journey

“From mother earth we are formed, from father sky we descend. Our journey is the ray of light—the embodiment of female and male rain. Within us we are a pure beam of light traveling through time.” *Bila’ashdla’ii—Naabaahii Dine*

Kinyaa’aanii (Towering House), *Nishli*, *Dzil Ghaa’i Shash Dine’e* (White Mountain Apache Bear Clan), *Bashishchiin*, *Tabaahi* (Edgewater people), *da shicheii*, *Dzil Ghaa’i Shash Dine’e Dashinali* (White Mountain Apache Bear Clan), *Gah Todee’ Naasha* (I am from a place called Rabbit Springs from the community of Jadito, Arizona). *Shimasani ei Katie Martin Duffy Baahii (Bahe) wolye nit’ee’* (My maternal grandmother’s name was . . .) *doo Shicheii ei John Naabaahii (Bahe) wolye nit’ee’*. (My maternal grandfather’s name was . . .) *Shinali asdzaan ei Ramona Beatty wolye* (My paternal grandmother’s name is . . .) *doo Shinali Hastiin ei Homer Beatty wolye*. (My paternal grandfather’s name is . . .). *Kot’eego eiya Naabaahii Asdzani nishli* (I am a Dine Woman Warrior every day.)

I was taught to properly introduce myself in the Dine language from a very young age. I was brought home to *Gah To*, Arizona (Rabbit Springs) when I was four days old from *Hozdoh* (Phoenix, Arizona) by my grandparents Katie and John Baahii (*Bahe*). This is when my educational journey begins. My understanding of my culture *Dine* (Navajo) was instilled in me by my grandparents by immersing in the Dine Language from birth. Like most children I learned by observation, mimicking, and modelling of my grandparents.

The purpose of a proper introduction in the Dine Language is to identify with your biological mother’s and father’s clan and your maternal and paternal grandparents’ clan. The place where you come from is always where your maternal grandmother is from. An introduction in the Dine language ties to many cultural stories and emergence

of the *Dine* (Navajo) People. To have self-identity is having respect for who you are and where you come from and to go out into the world as a warrior every day. As a warrior you seek knowledge to help and assist your clan, your people, and your community, the children for many generations to come.

Therefore, to identify and to respect my cultural beliefs I bring homage to my late maternal grandparents by a proper introduction. This is the essence of my foundation and understanding of what it is means to be a Dine. There is a parallel in the Dine cultural teachings and the western educational philosophy of learning. The Dine culture has infused science, math, arts, technology and engineering into practices of the culture. It has been a passion for me to make a connection to sustain our Dine culture and language for future Dine children of the Navajo Nation.

In making this connection possible, one has to reflect back at the history of education on the Navajo Nation in the United States. Since the inceptions of schools on the Navajo Nation, the structure and model of schools have followed primarily the rest of the United States. This model does not allow for our Navajo students to infuse their understanding of the world around them using their culture and language to analyze, synthesize, and sustain their educational purpose.

There are various forms of schools on the Navajo Nation: public schools, Bureau of Indian Education (formerly BIA Schools), grant schools, parochial schools, and private schools. The mission and goals of each form of school is different. The Navajo Nation does have a Department of Education similar to that of a State Department of Education. However, state and federal mandates differ in how the Navajo Nation schools accomplish educational progress.

The Navajo Nation Department of Education needs to become the catalyst for schools on the Navajo Nation to mandate the infusion of Dine culture and language in schools on the Navajo Nation. However, each school and community is isolated for their own purposes, functions, and goals. This disparity has evolved causing an imbalance in the Navajo Nation schools today. This possibly could be a factor of why our Dine students on the Navajo Nation have made very little academic progress.

As my grandparents would say, “ Why do the same thing if you are going to get the same results; think about your goal and plan how you will get there, if it means taking a different path and to work alone to reach it, then do it.” It is one of the Dine philosophy of learnings—*T’aa Hwi Ajit’eego T’eiya, La’jiliih* (Only “You” can accomplish the task).

Most schools that educate Navajo students have been struggling to meet Adequate Yearly Progress (AYP). The No Child Left Behind (NCLB; 2001) mandated that all public, charter, and federally operated schools in the United States were accountable for student learning by safeguarding “that all children have a fair, equal, and significant opportunity to obtain a high-quality education” (U.S. Department of Education, n.d., <http://www2.ed.gov/policy/landing.jhtml?src=pn>). NCLB authorized that schools hire highly qualified teachers, increase attendance, and proliferate high school graduation rates. There were increased expectations for academic proficiency in reading and math for English Language Learners (ELL). Following up on the goals outlined in the amended version of the 1965 Elementary and Secondary Education Act (ESEA), NCLB required uncompromising requirements to meet the needs of all learners nationwide from kindergarten through the 12th grade.

In the state of Arizona, third through eighth graders took the Arizona Instrument to Measure Standards, Dual Purpose Assessment (AIMS/DPA) in the spring of every year. Each school year, schools had to attain annual measurable objectives (AMO) to determine if (AYP) was met. The AMO percentages increased each year to reach 100% proficiency in reading and math by 2014. In spring of 2015, the state of Arizona offered the AZ Merit test to third through eighth graders. The AZ Merit scores were released to schools in Arizona in the fall of 2015; however, the scale of identifying if AYP was met is being developed by the Arizona Department of Education and will be released to school districts in early spring of 2016.

Like the Navajo Nation schools, the state of Arizona has various forms of schools. Arizona is known for being a national leader in the charter school movement. “Charter schools are established to provide a learning environment that will improve pupil achievement. Charter schools are created to provide additional academic choices for parents and students” (Arizona Revised Statutes, Chapter 8, Section 15-181).

Although the Navajo Nation Department of Education could research the impact of more charters on the Navajo Nation to perpetuate Dine culture and language learning, this has not been done. A charter school could provide alternative venues with flexibility on state curriculum and different requirements for teacher credentials that public schools do not enjoy, while remaining academically accountable to the state. Choice options to contemplate innovation and deviating from the status quo are the balance needed to allow Navajo students to sustain their Dine culture and language.

To become an educational innovator seeking the knowledge to help and assist our Navajo children is a priority to many Dine educators. However, at home on the Navajo

Nation and nationally, students have become a focus of percent, a number, and a question to many educators, the complex pressure of a national push to make sure students are making adequate yearly progress. The educational fun in teaching of children—*olta 'di bohooneedligii—k'adeeh adiih* (there is very little fun left in education) has been removed to maintain the adequate percentage to pass standardized testing nationally.

There is currently another national movement that is symmetrical and parallel to our Dine educational philosophy; The Dine culture and language has infused science, math, arts, and engineering into practices of the Dine culture. This allows for Dine learners to infuse their understanding of the world around them through their culture and language. The parallel in the national movement is known as S.T.E.M (Science, Technology, Engineering and Mathematics), mostly recently changed to S.T.E.A.M. (Science, Technology, Engineering, Arts-Integration, and Mathematics) with the addition of Arts-Integration.

The impact on Common Core in education today in the United States is that all students need to be career ready by the time the student graduates from the 12th grade. S.T.E.A.M education integrates various disciplines so students can become critical thinkers, and be ready for the job market when they are taught in a S.T.E.A.M school setting. Most scientists have a strong foundation in science, technology, engineering, and mathematics. Some of the challenges that face STEAM educators are issues related to energy efficiency, climate change, and hazard mitigation:

An individual's understanding of the characteristics features of STEAM disciplines are forms of human knowledge, inquiry, and design; awareness of how STEAM disciplines shape our material, intellectually, and cultural environments; knowledge, attitudes, and skills to identify questions and problems in life

situations, explain the natural and designed world and draw evidence-based conclusions. (Rogers, 2013)

The explanation of the natural world using evidence-based conclusions is relevant to the Navajo (Dine) as a natural scientist. The Navajo oral histories and stories relate to the universe and the existence of everything from *Nihima Nahasdzaan* (Mother Earth) to *Nihita' Yadilhil* (Father Sky), *Nilchi* (Air), *To* (water), *Ko* (fire), *Naaldlooshii* (animals), *Chil Altsaas'ei* (plants), and all that exist in this great universe. As a Dine immersing yourself in your native language gives another Dine person an understanding of these phenomena that only exists if a Navajo child is taught to carry it on for their people. This approach to teaching is not seen in a traditional school setting. The transfer of knowledge that exists from a traditional Navajo grandparent to the younger generations to follow that continues our existence as natural scientists has become lost through years of bureaucratic venues of *what if's*, *not's*, or *should have been*. Navajo leaders signed *Naaltsoos Sani* (the Old Paper—Treaty of 1868). The treaty promised that for every 30 Navajo children between the ages of 6 and 16 a school house and a teacher “competent to teach the elementary branches of an English education shall be furnished” (United States of America, Treaty of 1868).

The history of Navajo education and implementation of the traditional school systems for Dine students has failed in so many ways. It is behooving as a Dine educator to become a catalyst for the next generation of learners by fusing what has worked for traditional educators. This is the parallel that exists in a new and innovative creation of learning conducive to Dine learners through STEAM education for all Navajo students to learn to apply basic content and practices of the STEAM disciplines to situations they encounter in life.

Purpose of the Study

The purpose of this study was to describe a new school model for Dine (Navajo) learners where Dine students will experience how to apply knowledge and skills personally, meaningfully, and socially relevant to life situations through the medium of Dine language and culture maintenance. Our Dine children are precious and worth the ideology of seeking an innovative school derived as a charter school with a foundation of traditional Dine methodologies that align with STEAM education.

This study explored a new way to perpetuate Dine (Navajo) culture and language through a model referred to as M.A.T.S. (Mathematics, Arts, Technology, Science, the renaming of STEM to STEAM) for the purposes of this document in this study. The research supports the need to develop the model M.A.T.S. as a school for the Navajo Nation.

Research Questions

The leading research question states, how can the model M.A.T.S. school on the Navajo Reservation perpetuate Dine culture and language for its learners? The sub-questions are listed as follows:

1. What are the main principles of STEM and STEAM education?
2. How do STEM and STEAM principles remedy Dine culture and language pedagogy?
3. How do charter schools support flexibility, innovation, and autonomy of choice?
4. What would a model M.A.T.S. school on the Navajo Nation look like with a focus on perpetuating Dine culture and language?

Definition of Terms

To help the reader better understand this study, the following terms were defined:

Dine: The *Diné* (Navajo or *Naabeehó*) are a Native American people of the southwestern United States. They are the second largest federally recognized tribe in the United with 300,460 enrolled tribal members as of 2015 (Wikipedia, 2016).

Navajo: The Navajo (Navajo: *Diné* or *Naabeehó*) are a Native American people of the southwestern United States. They are the second largest federally recognized tribe in the United with 300,460 enrolled tribal members as of 2015. (Wikipedia, 2016).

No Child Left Behind Act of 2001 (NCLB): Public Law 107–110 107th Congress, an act to close the achievement gap with accountability, flexibility, and choice, so that no child is left behind. It was enacted by the Senate and House of Representatives of the United States of America in Congress, cited as the No Child Left Behind Act of 2001, so as (a) to improve the academic achievement of the disadvantaged, Section 101; (b) prepare, train, and recruit high quality teachers and principals; (c) provide teacher and principal training and recruiting funds, Section 202; and continue awards related to language instruction for limited English proficient and immigrant students, Section 301 (U.S. Department of Education, n.d., <http://www2.ed.gov/policy/elsec/leg/esea02/beginning.html#sec1>).

Adequately Yearly Progress (AYP): Adequate Yearly Progress (AYP) is the key element of the accountability system mandated by the federal No Child Left Behind Act (NCLB). The AYP in its 2006 form as the prime indicator of academic achievement is not supported by reliable evidence. Expecting all children to reach mastery level on their state's standardized tests by 2014; the fundamental requirement of AYP is unrealistic.

The growth model and other improvement proposals now on the table do not have sufficient power to resolve the underlying problems of the system. In addition, the program, whether conceived as implementation costs or remedial costs, is significantly underfunded in a way that will disproportionately penalize schools attended by the neediest children. Further, the curriculum is being narrowed to focus on tested areas at the cost of other vital educational purposes (Mathis, 2006).

English Language Learner (ELL): English-language learners, or ELLs, are students who are unable to communicate fluently or learn effectively in English, who often come from non-English-speaking homes and backgrounds, and who typically require specialized or modified instruction in both the English language and in their academic courses. (Great Schools Partnership, 2014).

S.T.E.M. Education Act of 2015: Public Law No: 114-59 (10/07/2015) (Sec. 3) requires the Director of the National Science Foundation (NSF) to continue to award competitive, merit-reviewed grants to support (a) research and development of innovative out-of-school STEM (science, technology, engineering, and mathematics) learning and emerging STEM learning environments; and (b) research that advances the field of informal STEM education. Supported activities are to include research and development that improves understanding of learning and engagement in informal environments and design and testing of innovative STEM resources for such environments to improve STEM learning outcomes and increase engagement for elementary and secondary school students and teachers and the public (Congress.Gov., n.d., www.congress.gov/bill/114th-congress/house-bill/1020).

S.T.E.A.M.: The objectives of the STEAM movement are to transform research policy to place Art + Design at the Center of STEM. Encourage integration of Art + Design in K–20 education. Influence employers to hire artists and designers to drive innovation. (STEAM, 2016, stemtosteam.org/).

M.A.T.S.: Mathematics, Arts, Technology, Science, the renaming of STEM and STEAM for the purposes of this document.

Significance of Study

The Dine people, language, and culture are distinct to this universe. As my grandparents did for me as a young Dine learner through nurturing, observation, and modelling how to sustain what it means to be a Dine; it is my obligation as Dine educator to provide the direction and guidance to bring balance to our Dine educational focus and purpose. As I learned to identify with my four traditional clans and environment, our Dine children need to be given an opportunity to perpetuate their Dine culture and language. This study is necessary to support the creation of a model school that is no longer of the status quo; the creation will be unique as our Dine culture, language, and people.

Organization of Study

This study is detailed in four chapters. Chapter 1 is an overview of the study progression with local, state, and national policy, practice, and its impacts on Dine education. Chapter 2 contains the review of literature; a discussion on the history of Navajo education and pedagogy, STEM and STEAM education and pedagogy, and charter school history. Chapter 3 is the proposal and the development of an innovative

school. Chapter 4 details the summary, conclusions, and the next steps of implementing the plan for the school.

CHAPTER 2

REVIEW OF THE LITERATURE

History of Dine Education

The Native American Language Act was passed in 1990 by the federal government, which recognizes the value of Native American languages and cultures. The responsibility of ensuring survival of culture and language is placed both on the U.S. government and American Indians (Rhodes, 1994) by this act: however, this act did not automatically change practices in the schools (Skinner, 1999). Furthermore, the Indian Nations at Risk Study (1991) set five national strategies, one of which is maintenance of native language and culture: “Establishing the promotion of students’ tribal language and culture as the responsibility of the school” (Indian Nations at Risk Task Force, 1991, p. 22). This report supports academic education of language and culture in the schools in order to reinforce maintenance and renewal. Research has shown improved academic performance with increased cultural identity. Subsequently, the Task Force found that “schools that respect and support a student’s language and culture are significantly more successful in educating those students” (p. 16). Policies, such as the Native American Language Act, provide support for programs within educational institutions today. According to Fishman (1996), many of these school programs still fall short of their expectations. Rhodes (1994) affirmed that “the present educational system within the Navajo Nation is not working well perhaps because the students do not fit the system, perhaps because the system does not fit the students. If education is to improve, something must change” (p. 45).

The Navajo Treaty of 1868 committed the federal government to providing a house and a teacher. In Article 6, it states,

In order to insure the civilization of the Indians entering into this treaty, the necessity of education is admitted, . . . and they therefore pledge themselves to compel their children, male and female, between the ages of six and sixteen years, to attend school; . . . and the United States agrees that, for every thirty children between said ages who can be induced or compelled to attend school, a house shall be provided, and a teacher competent to teach the elementary branches of an English education shall be furnished, who will reside among said Indians, and faithfully discharge his or her duties as a teacher. The provisions of this article to continue for not less than ten years. (Acrey, 1994, p. 321)

The Navajo Nation wrote an educational policy in 1984 that considered the needs of Navajo parents and children that was enacted as a tribal law (Navajo Division of Education, 1985). Nonetheless, schools held their allegiance to the state and federal governments, according to Navajo Nation President Peterson Zah in 1992, resulting in “a policy that is not in force” (p. 397). The policy is still not enforced on the Navajo Nation. The Navajo Nation government approached this dilemma and attempted to cease this trend by drafting the Navajo Nation Education Policies (1985) that is a directive to all schools on the Navajo reservation. An important aspect of this policy is the emphasis on instruction in the fundamental basis of life, culture, history, and language. The cultural units are to be determined by the local parents and school board. The Navajo Nation did consider creating content standards for all schools serving Navajo students, but did not pursue this approach. Instead, most of these schools follow state standards (Fox, 2000).

According to William Mehojah, Director of the Office of Indian Education Programs (OIEP), in a presentation to staff members of the Western Navajo Agency schools in February 2001, “We must employ methods never before attempted. I said this long ago. To reach all these goals, we need to do things differently. All children can learn

and be successful. Our kids can learn and perform.” This leads to a search for new and different methods to ensure academic success for Navajo students and more school reforms.

Educational researchers and educational leaders have at times approached traditional leaders for specific content of certain curricula for Dine culture and language programs in some reservation schools (Roessel, 1979). Infrequently are these recognized traditional leaders asked to give input on the process of teaching and learning for the proper growth in intellect of Dine youth. Furthermore, this type of discussions is rarely systematically researched and incorporated into educational reform efforts and administrative decisions (Deyhle & LeCompte, 1994).

The Navajo Nation schools tend to legitimize the western value system, which becomes a source of misunderstanding and oppression, and leads to a disregard of the existence of the culture of the Navajo students (Deyhle & LeCompte, 1994). Ogbu’s (1987) research supports the notion minority groups who have a strong foundation in their language and culture, or who have no internalized feelings about their culture or language, tend to succeed in school. Cummins (1986) terms this internalized feeling as bicultural ambivalence. It is defined as the conflicting feelings students have about their culture in relation to the Western society that compounds the perception of an inferior status. Bicultural ambivalence occurs when educators and others in the community reinforce feelings of inferiority due to institutional, economic, and social discrimination to children inadvertently through an expectation of failure. It is the result of generations suffering “overt racism” (Cummins, 1992, p. 4) and is a cause of school failure. This affects children of a minority culture even before entering school.

Today the schools don't use Dine cultural teachings because they follow the *Bilagaana* (Western Educational Philosophy) way of thinking about life. The schools need to change so those educators can help young Dine students to follow Dine understandings and language. The only way to get our young Dine children to learn again is to teach them about their identity as Dine. Teach them about how they are related to everything, how to care for all life and understand all that goes on in life. The children have to be here to see, feel, and experience what we understand about life. The fire in the *hogan* is a grandmother to us. The children need to live it daily to learn it. (Begay, 1998)

According to the Dine Cultural Standards for Students (Holm, 1999), the Blessing Way teachings include

respecting the sacred nature of the self; knowing who you are; think for yourself; maintaining strong reverence of the self; having understanding of self; possess learning ability; having understood self; planning for self; thinking for self; possess kindness; being thankful; being appreciative; your character; positive relating to others; be generous and kind; seek traditional knowledge and traditions; having reverence and care of speech; being a careful listener, having a balanced perspective and mind; showing kindness towards others; respecting and valuing; maintaining enthusiasm and motivation for one's work; acknowledging and respecting kinship and clanship; showing positive feelings toward others; expression of appropriate and good sense of humor. (pp. 73-74)

According to Gregory A. Cajete, Santa Clara Pueblo (1994), these problems exist in schools because "Indian people continue to struggle with modern educational structures that are not of their own making, but are separated from, and compete with, their traditional forms of education" (p. 218).

Evangeline Parsons-Yazzie (1996) conducted research on the Navajo Nation and observed lateralized oppression in the schools. She stated,

I have witnessed Navajo teachers and school administrators sometimes discriminate against their own kind. Once they obtain a position of power, they begin to think of themselves as better than other Navajos, and forget their Navajo teachings of kindness, equality, respect for others, and empathy. Navajos cannot allow this kind of behavior to sabotage unity among Navajos in the work place. Without unity and the Navajo language, the Navajo people would never have survived *Hweeldi* and forced education. Unity must remain the Navajo's way of life for the sake of the children, the culture, and the language. (p. 66)

Pavlik (1990, p. 101) stated that the elements that we blame for the past and the present state of Indian education, such as inadequate funding, competing systems, and constant chaotic shifts in policy are all merely products of a larger problem: we still have not determined the ultimate mission of Indian education. Be it assimilation, self-determination, cultural preservation, or whatever the goal of the moment, we continue to stumble along, changing this, changing that, and changing nothing. Meanwhile the Navajo people continue to find the rungs of Manuelito's ladder broken and seemingly in a state of disrepair.

Providing a nurturing and guiding environment at school can positively impact students' learning abilities. Lee confirmed that "a school's philosophy, goals, and curriculum can have profound effects on students' achievement and future plans. The school setting can shape the experiences students have with their heritage language as well, which in turn affects student language use. (Chang & Lee, 2007)

History of Charter Schools

Regardless of their ultimate success or failure . . . charter schools today offer some legislators a politically attractive response to many of the demands being made on them—a response not just to the calls for private school choice, but also to demands for deregulation, teacher empowerment, and dramatic educational change. (Contreras, 1995, p. 219)

The opening of the first two charter schools in Minnesota in 1992 has brought the most promise for public school choice to change the American public educational system. Charter schools are independent public schools that operate under a contract, or charter, with a governmental sponsoring entity to provide educational services to students. The central feature of charter contracts is similar to traditional public schools; charter schools are public entities, open to all students and are funded by public dollars.

Ted Kolderie (1990) is often credited with developing the charter school concept. In the essay, *Beyond Choice to New Public Schools: Withdrawing the Exclusive*

Franchise in Public Education, he outlines the concept of autonomous public schools that operate outside the traditional public school system (TPS). As autonomous entities, charter schools are free to institute innovative organizational and pedagogical strategies. However, some key organizational characteristics often associated with charter schools, such as focused school mission, are grounded in educational research that pre-dates Kolderie's essay (Rebarber, 1997).

Charter schools are public schools of choice in the USA. The number of students attending charter schools continues to increase rapidly. Forty states and the District of Columbia have laws that allow for fiscally independent, tuition-free charter schools. More than 1.3 million students attend over 4,400 charter schools established since the first state charter law was adopted in 1991 (National Center for Educational Statistics, 2010). Given the increasing numbers of charter schools and students served by those schools, policy makers and researchers have begun to scrutinize the quality of education received in a charter school setting.

According to the *Review of National Charter School Study 2013*, the following findings were made:

1. On average, it was estimated that students in charter schools in the 16 states studied in 2009 fare better on academic tests relative to their peers in traditional public schools in 2013 than they did in 2009.
2. At least two explanations are available for the apparent improvement in charter schools relative to traditional public schools. The first is the reported overall decline in performance at TPSs. The second is the closing of lower-performing charter schools (approximately 8% of 2009 sample).

3. When taken together across the 27 states, students in charter schools were estimated to score approximately 0.01 standard deviations higher on reading tests and 0.005 standard deviations lower on math tests than their peers in TPS.
4. There were significant state-to-state variations in the estimated differences between charter and TPS.
5. The apparent advantage of charter school enrollment was estimated to be slightly greater on average for students in poverty and Hispanic English Language Learners. Conversely, White students, Asian students, and non-ELL Hispanic students appeared to fare slightly worse in charter schools than their peers in TPSs.
6. The advantage of being enrolled in a charter school appeared to increase as a function of the number of years a student was enrolled in a charter school.
7. When considering school averages rather than individual students, 25% of charter schools were estimated to have greater average growth than comparable TPSs in reading, 29% were estimated to have greater average growth in math. Nineteen percent of charter schools were estimated to have lower average growth in reading and 31% were estimated to have lower average in math. (Maul & McClelland, 2013)

History of STEM Education

The foundation of STEM education in the United States is often traced to the launch of Sputnik by the former Soviet Union in 1957. The Sputnik launch initiated many changes in educational reform in the United States, including the 1958 legislation of the National Defense Education Act (NDEA) and the National Aeronautics and Space Act (NASA). The NDEA provided one billion dollars to be spent on funding students to

pursue a college education to improve the nation's competitiveness in STEM disciplines (Executive Office of the President of the United States (2013)).

The operational origins of STEM education traces back to 1983 National Commission on Excellence in Education report, *A Nation at Risk*. Mahoney (2010) offered an interpretation of the report's significance and outcome:

The influence of this report and its recommendations are echoed in the development of national standards produced by academic organizations such as the National Council of Teachers of Mathematics (NCTM), the National Research Council (NRC), AAAS, and ITEA. It is within this process that the history of STEM can be traced. NCTM (2000), AAAS (1989), NRC (1996) and ITEA (2000) documents all suggest the combination or integration of their respective subjects in an attempt to enhance student learning and STEM preparation. (p. 24)

The National Research Council created the National Science Education Standards (NSES) in 1996 to promote and expand the importance of elementary and secondary science education (National Research Council, 2007). The standards guide teacher learning, student learning, and the integration of science in conventional classrooms. In 2011 The Next Generation Science Standards (NGSS) were composed and implemented in California in the fall of 2013.

A report written in 2010 titled *Prepare and Inspire: K-12 STEM Education for America's Future*, written by the President's Council of Advisors on Science and Technology, covers the initiatives in STEM education. The initiatives outlined (a) standards: support the current state-led movement for shared standards in math and science; (b) teachers: recruit and train 100,000 teachers in the next decade who can prepare and inspire students in STEM; (c) teachers: recognize the reward the nation's top 5% of STEM teachers, by creating a STEM Master Teacher Corps; (d) educational technology: use technology to drive innovation by creating advanced research projects

agency for education; (e) students: create opportunities for inspiration through individual and group experiences outside the classroom; (f) schools: create one thousand new STEM-focused schools over the next decade: and (g) ensure strong and strategic national leadership (President's Council of Advisors on Science and Technology, 2010). The federal support of the initiatives with funding is beneficial as the STEM movement ameliorates in the years to come.

There is a sincere need to create a STEM movement in the United States, due to the U.S.A. at the rear of other countries in the STEM innovations category. There is some speculation that due to the demands of No Child Left Behind and the heavy focus placed on reading and math literacy, science was somehow left behind and not a primary concern for further education (Corneliussen, 2011). The United States has a history of STEM initiatives that date back to the Sputnik era. This history of STEM in the U.S. allows for American students to build the foundation in science and math.

STEM Pedagogy

STEM pedagogy is transdisciplinary learning that allows students to use project-based learning to define the world around them in order to focus on authentic learning, new perspectives, and current issues. In a STEM lesson, the teacher is the facilitator, not the content driver (Aleman, 1992; Darling-Hammond & Youngs, 2002; Fajemidagba, Salman, & Olawoye, 2010; Glasgow, 1997; Nikirk, 2012). The assimilation of science occurs through technology, engineering, and math through inquiry-based, project-based, and real-world relevance. The learning in and outside the classroom is discovery based. Students are active participants in building new content understanding (Nikirk, 2012; O'Neill, Yamagata, Yamagata, & Togioka, 2012). STEM pedagogy incorporates content

areas to empower the learner with a sense of being in control of their learning, engaging their desire to learn. When teachers dictate the what, where, how, and when of learning, students determine much of the learning through inquiry and discovery (O'Neill et al., 2012).

Nikirk (2012) recommended ten strategies to effectively implement methodology reflecting a STEM learning environment:

1. Show graphics first; students react and learn from visuals more quickly than reading text;
2. Start with the end in mind; based on Steven Covey's habits, teachers should begin with the objective and students should know the objective;
3. Start with the concrete concepts, and then move to the abstract; this should be accomplished by using real-world examples so students can relate to the abstract concepts;
4. Integrate technology into teaching; use interactive instructional strategies by incorporating technology through storytelling, virtual labs, games, software, blogs, digital cameras, and audio devices;
5. Teach behavior appropriate to business and industry needs; presenting data through graphs and charts, meeting and greeting professional groups, demonstrating business etiquette, speaking in the active voice;
6. Transition from a teacher-centered to a learner-centered classroom;
7. Transition from group-work to team-work; this teaches students the power of a vision and working toward a common goal, rather only producing a product;
8. Fostering a learning environment that values curriculum;

9. Learn to evaluate and utilize technology in a meaningful way;
10. Engage students as teachers, project leaders, technology support, and “mega brains” (problem solvers); this is accomplished by recognizing the individual strengths of every student in the class (Nikirk, 2012, p. 12).

Mastering STEM pedagogy is critical to be able to reflect and furnish a selection of strategies and methods for strengthening math and science education. Furthermore, in mastery being engaged daily and prepared to collectively engage with students by questioning allows for the student to attain critical thinking skills and the motivation to process independently. STEM learning impacts the U.S. STEM movement.

Dine Pedagogy

Pewewardy (1998), a Comanche and Kiowa principal of an award-winning American Indian magnet school, advocated reforming public education through magnet schools and charter schools, not simply depending on special grants and short-term funding reactions to crises. He noted the success of the Navajo’s Rough Rock Demonstration School since its establishment in 1966 and refers to “transformational indigenous schools for the 21st century” as holistic, using current brain-based research findings and cooperative learning research (p. 33). He argued that politics have blocked the development of a pedagogy that can realize excellence for American Indian students. Eminence is based on traditional indigenous educational values and spiritual levels, rather than a definition of success that is based in terms of the Western educational philosophy.

The foundation of leadership for the Dine is the *Naat ’aanii* (leader) system. Dine traditional elders, particularly medicine practitioners knowing at least the Blessing Way, have been recognized as leaders in Dine culture who influence every aspect of Dine life

(Hill, 1940). The blessing way ceremony is reared as one of the most important traditional practices of the Dine. The help, advice and wellness education, and welfare of community decisions by these traditional leaders are acknowledged. They have beneficial knowledge that affects the general welfare of the whole community (Donald, 1970).

The main story seems to be that these blessing way singers carry a vision for a pedagogy for Dine education. It is based on their philosophy and experiences, tempered by a recognition of obstacles and the reality of the negative factors controlling Western education today. Negative, in the sense that history continues to repeat itself, which has proven to be detrimental to the Dine way of life. They have considered their own experiences of learning Dine way, the content of what was taught, the methods and approaches used for teaching, and the climate or learning conditions they were taught under. This vision incorporates a historical perspective with and acknowledgment of current reality, to build a paradigm of traditional Dine way of educating. This would be education as teaching and learning in Dine way, for modern definitions of success, as a good Dine person. This is the beginning of a pedagogy of possibility for Dine education. (McCauley, 2001, p. 73)

“These songs are teaching songs. They are the ones to teach with. From here, they can start singing . . . these songs are like this” (a Blessing Way Singer.

This is the reason we need to teach our children these teachings. With this, the Navajos grow old and live a good life. These teachings were given to us from the Holy People. This is the reason why there is no doubt about these teachings, that they’re good for us. This is the reason why we teach our children with love. With no doubt about it. (McCauley, 2001, p. 83)

The Navajos have Earth prayers, Universe prayers, and Mountain prayers. We still have these prayers up to this day and they have not changed. The *Sisinaaniji* Mountains are dressed in white shell; to the south the mountain is dressed in turquoise; to the west the mountain is dressed with abalone; and to the north the mountain is dressed with black jet. We are like this. We have our ceremonies and they are sacred to us. It is like this. This is how we had a lot of sheep, cows and horses; we hardly had hunger. Food was placed for us to eat in the summer.

The Dine, they hold onto one another with caring ways and love. They are holding onto each other with *K'e* . . . This is where, when you're a Dine you try to work together. And this is where *K'e* comes in. You greet each other with respect. This is how you stay together, like a barbed wire does. This is how you can hang onto each other and go into the deep water and even into the waves and make it across. This is how you can live a good life. (McCauley, 2001)

We as Dine are like this. We are strong with our language and our ways and prayers; it's like our life. If we lose all of this we will be weak. We will be like a paper, blown away by the wind. You just look after the paper and it blows away, because there's nothing to hold the paper down. Our language is like having roots holding them down. They say that we are like plant people. (McCauley, 2001, p. 84)

The Vision of Change

This vision incorporates a historical perspective with an acknowledgment of current reality, to build a paradigm for change towards a more traditional Dine way of educating. Within this paradigm, educating involves teaching and learning in the traditional Dine way, and a modern definition of success incorporates being a good Dine person.

A Navajo Nation school that has documented success with integrating Navajo language and culture is Tse Ho Tso Learning Centers in Window Rock, Arizona. The Navajo Immersion Program teaches Navajo language reading and writing exclusively in kindergarten and first grade. Navajo is the language of communication and instruction in those grades. English language is introduced in second grade and becomes the language of instruction in later grades. This program was implemented in 1986 and has resulted in higher standardized test scores for those students who chose to participate. Also, this program has reported increased parental involvement in the school and improved student attendance. By using both English and Navajo languages in the educational process, the students' self-esteem, learning abilities, and social development seem to be enhanced.

This school is using the Navajo Nation's language and cultural standards, which have been aligned with the Arizona State Standards. The administration asserts that students in the program will become more literate and creative citizens who are better prepared for both Navajo and American life (Window Rock Unified School District, 2001).

In addition, the Arizona State law, Title 15-535, which prohibits sectarian instruction under the penalty of revoking the state teaching certificate, binds public school teachers. Any interpretation of conduct in the classroom as religious can have dire consequences. Most often, cultural teachings are supplementary to the existing curricula as add-ons or electives (Deyhle & LeCompte, 1994). All of these factors contribute to inhibiting changes based upon Dine traditional philosophy in school structure and curricula. In any case, this type of adding on may be inadequate, according to the assertion in the findings of this study that teaching and learning should be conducted in a climate of *Sa'ah Naaghai Bik'eh Hozhoon*; one cannot separate this philosophical perspective from Dine teaching.

A few innovative schools implore Navajo Nation education policies that embrace the Navajo language, culture, history, civics, and social studies, which "shall be included in the curriculum of every school serving the Navajo Nation" (Navajo Division of Education, 1985, p. 1). This was the mandate that supported Dine College's (Navajo Community College) restructuring of the curriculum under the Dine Philosophy of Learning (McNeley, 1988). It was also instrumental in the more recent reorganization efforts of the federal contract school, Rough Rock Demonstration School, as a bilingual, bicultural institution (Dick, Estell, & McCarty, 1994). These schools moved beyond the deficit theory (i.e., problems lie in the individual learner), the effectiveness theory (i.e.,

problems lie in the behavior of the organization), and the cultural differences theory (i.e., problems lie in student learning style preferences that are not addressed) of school restructuring. They have moved toward a more critical consciousness theory in which schools are seen as shaped by powerful economic and political structures and emphasize the need to include the Navajo culture into all operations, programs, and lessons (McLaughlin, 1994).

Although there are parameters that this integration of Dine language and culture helps transfer learning in English subjects, these schools may not be able to address the assertion of this study that educational leaders in Western education schools cannot be trusted to support the traditional Dine teachings. Examples of successful bilingual and bicultural programs and schools could be reviewed for applicability in Navajo Nation schools within this emerging pedagogy of possibility for Dine education. Yet, these suggestions need to be balanced with the findings of this study that Western education, as it is now practiced, is detrimental to the Dine children and communities (McCauley, 2001).

A program that has proven to be effective in its use of culturally compatible instruction within a standard classroom in Hawaii is called the Kamehameha Early Education Program. The reading program initiated at Rough Rock School was based on this model (Dick et al., 1994). In Hawaii, the Hawaiian language is established within some schools that range from preschool to college. These schools conduct instruction in the native language in the community of Punana Leo. The state funding for these schools is very inadequate, but through the leadership of the University of Hawaii at Hilo, federal government grants and private entities support these schools (Silva, 2000).

Former Navajo Nation President Hale, in a statement made in reference to the executive order requiring the instruction of Navajo language in Headstart centers, said,

The Navajo language was given to us by the Holy People to communicate amongst ourselves and more importantly with themselves. Only through the perpetuation of the Navajo language and culture will the Navajo Nation and the Navajo people survive as a unique people. (*Dine Culture Curriculum Framework Distributed*, 1996).

This provision of a house and a teacher could be used to fund a hogan and a salary for a certified teacher who facilitates a home schooling service that is based on a pedagogy of possibility for Dine education. Built for instructional purposes, traditional teachings should be conducted in a hogan (McCauley, 2001).

Summary

Rhodes (1994) affirmed that “the present educational system within the Navajo Nation is not working well perhaps because the students do not fit the system, perhaps because the system does not fit the students. If education is to improve, something must change” (p. 45).

In summary, the educational system implemented on the Navajo Nation has focused primarily on the traditional structures created by the federal government. In review of the educational history of the Navajo students, they continue to maintain at-risk status nationally, students continue to drop out, the Navajo identity and fabric of understanding are under attack, and what it means to be a Dine learner is nullified by mandates that are not conducive to the Navajo learner. Therefore, a major paradigm shift has to occur in the Navajo educational structure, curriculum, and pedagogy. This shift will have to impact the learner first by incorporating an innovative school that allows for the Navajo learner to balance western educational philosophy of learning and the Dine

educational philosophy of learning. The structure should incorporate the ability for the Dine learner to use a primary focus of learning with hands-on explorations.

Furthermore, the Navajo pedagogy needs to utilize the foundation of Navajo learning by implementing Navajo science teaching in a natural traditional Navajo approach along with *K'e* (relationship in Navajo culture), respect for self, others, and environment. In all, the literature indicates there is a need to create a different type of learning environment for the Navajo learner. Chapter 3 is a proposal of an innovative school, which possibly could become a model for the Navajo Nation.

CHAPTER 3

K-3 ONYX CHARTER SCHOOL PROPOSAL

Mission

O.N.Y.X. (*Oohoo'aah, Na'nitin Yee nooseel Xploria*, which translates to a Center for learning, acquiring knowledge, and growing through a Navajo approach to exploration, is a public charter, serving students in grades K-3 who reside in Jeddito Community. Our purpose is to provide an educational foundation that ONYX will prepare students to persevere through the perpetuation of Dine (Navajo) culture and language with methodologies of M.A.T.S. (Mathematics, Arts, Technology, and Science). This will lead students to be more creative and develop skills that balance the understanding of the two worlds.

The ONYX will serve students in kindergarten and first grade. Every year a grade will be added until capacity of 3rd grade, with 60 students in the average daily membership (1 classroom per grade, 15 students per classroom). As a public charter school ONYX is to serve all of Jeddito Community, with 98% ratio of students qualifying for free and reduced lunch.

Based on the educational structures on the Navajo Nation, which include public schools, tribal grant schools, BIE (Bureau of Indian Education) schools, parochial schools, and private schools with primarily the same educational structure enforced from the 1870s by the United States government has not been totally beneficial for Navajo students. Based on summative assessments, Navajo Nation schools are being outperformed by charter schools and other forms of schools off the Navajo Reservation in Arizona.

The proposed ONYX school has several goals in alignment with our mission. ONYX will employ dedicated educators and community members with excellent work ethics who are committed to closing the achievement gap, while promoting a creative outlook on the world around them. Students will leave ONYX School with skills in Navajo Language and Culture with a foundation in M.A.T.S. Education. The implementation of a Navajo Language immersion component and a Friday school to allow for additional instruction and exploration for Navajo Language Arts, culture, science, and enrichment activities.

ONYX School's educational program will be driven by a belief that all learning will be academically rigorous with a well-designed curriculum to students in becoming lifelong explorers of learning and productive members of society. This will allow ONYX to stay true to the mission to promote *K'e* (relationship in Navajo Culture); respect for self, others, and environment; and most importantly to use natural/traditional scientific skills passed on through Navajo culture. In our learning environment, there will be constant and continuous communication among administrators, teachers, parents, and community leaders.

ONYX will accelerate on the strength, dedication, and experience of our talented teaching team as well as our partners and charter sponsor to create a unique educational program conducive to the learners. Professional growth will be supported by common planning and various opportunities to improve professional practice. We will use the Phonographix program in kindergarten and first grade for students to acquire the sounds of letters. This form of instruction is also transferrable to learning how to read and write in Navajo. Along with the Phonographix program will be the reading program Storytown

for grades K-3. The math curriculum will enable students to develop higher-order thinking skills and will increase teacher content by having them work side-by-side with a math specialists. Our program will allow for students to use hands-on approach with inquiry-based learning with a foundation in Navajo traditional/scientific approach to learning.

This scientific approach to learning will allow the Navajo learner to balance and understand the process of science identified in M.A.T.S. An example of a lesson that could be seen in this school would be students identifying the various colors of a Navajo traditional woven rug. The exploration would include the specific plants that were used to dye wool used in the rug. This would include the chemical component of each plant to make such a color. Furthermore, students would be able to test through wool dyeing. This activity will incorporate science, technology, arts, and mathematics. The foundation of ONYX is to make a balance of understanding to utilize the Navajo approach to learning to synthesize their understanding of the world around them. This approach is aligned to Common Core goals of students to have high-order thinking skills, to think critically, to question, to articulate, and to synthesize their understanding.

All in all, the ONYX longs to provide an exceptional educational experience. Each child is encouraged to develop into a self-motivated, resourceful problem solver and to become an individual who is responsible for his/her own behavior and education. All of this will be guided by the Navajo core values *K'e* (relationship in Navajo culture), respect for self, others, and environment, and to use natural/traditional scientific skills in Navajo culture.

Mission Statement

Mission Statement for O.N.Y.X. is a public charter school K-3 serving students who reside in Jeddito. Our purpose is to provide an educational foundation that nurtures K'è (relationship in Navajo Culture), respect for self, others, and environment, most importantly to use natural/traditional scientific skills passed on through Navajo culture. ONYX will prepare students to persevere through the perpetuation of Dine (Navajo) culture and language with methodologies of M.A.T.S. (Mathematics, Arts, Technology, and Science). This will lead students to be more creative and develop skills that balances the understanding of two the worlds. O.N.Y. X. will prepare its students to be productive citizens in society via a curriculum that allows for students to perpetuate Dine culture and language via a curriculum embedded with M.A.T.S. foundation. This will lead students to think creatively and develop strong skills to balance and survive in two worlds.

O.N.Y.X is committed to promoting Navajo culture and language through the use of a language immersion program in addition to providing culturally enriching activities through curriculum-embedded instruction and exploration experiences. The Navajo language acquisition will occur naturally by using Navajo as the language of instruction during a portion of the day. This approach has been found to produce “high academic outcomes and bilingual/bi-literate students.” This will allow students to leave O.N.Y.X. with strong literacy skills in the Navajo language, along with becoming culturally competent and compassionate citizens. In addition, students will learn the contributions Navajo people have made to society, how they have influenced other societies. ONYX students will enjoy the benefits of multilingual skills, and acquire skills necessary to participate in a culturally and globally diverse society (Collier, 1995).

ONYX will integrate M.A.T.S. into the classroom. ONYX will use National Educational Standards and Common Core at each grade level. Starting in kindergarten, students will be exposed to M.A.T.S., developing and balancing their world around them with a foundation in the Navajo traditional approach to inquiry-based learning.

ONYX will serve all K through 3 students in the community of Jeddito while exposing students to Navajo culture and language. This will provide an exceptional opportunity for promoting respect. All stakeholders within the organization will focus on students' self-respect and respect for learning.

After-school and Friday programs that focus on enrichment activities that align with the curriculum will provide encouragement for creative thinking to meet the needs of all learners. Exploration and creativity will be promoted during instruction during these programs.

At ONYX learning to persevere begins in the classroom at an early age, as students face challenges and difficulties with learning. ONYX will strive to be cognizant of the effective and meaningful strategies to persevere through obstacles to be successful with the total child in mind, emotionally, socially, spiritually, and academically.

Community Need and Support

The community of Jeddito has a population of 282 (USA.com, 2010-2014, www.usa.com/jeddito-az-population-and-races.htm). Of that population, 98% are Native American, 0.71% Asian, and 0.35% White. The nearby school district that has well-documented need for finding ways to improve student achievement is a border town school in the Holbrook Unified School District. One hundred percent of its students qualify for subsidized lunch.

In a recent study, charter schools achieved stronger outcomes than traditional public schools with underserved student subgroups of California. These subgroups included English learners, African-American and Latino students, and low-income students. “These student populations were concentrated in charters at the end of Percent Predicted Academic Percentage Index (API). The percentage of students in these subgroups was less predictive of API at charter schools than at traditional schools” (California Charter Schools Association, n.d., <http://www.calcharters.org/>)

One of the sub-groups is identified as Jeddito’s largest population. At ONYX, 100% of the student population will qualify for subsidized lunch. This will allow us to target populations in need. ONYX will have an important position in the community, which holds potential for improving the performance of all students. The effects on the lives of students and families we serve will have dramatic effects on to the middle schools and high schools our students will attend.

Furthermore, ONYX has the potential within our faculty, staff, families, and communities to become a Navajo Nation school model, of a high-achieving school that will perpetuate Dine culture and language with a foundation in M.A.T.S. There are many small communities throughout the Navajo Nation that yearn to have a model school that will support Dine culture and language. Many schools on the Navajo Nation continue to utilize the paradigm of education that was derived by the federal government upon the signing of The Treaty of 1868.

The biggest assets of ONYX will be its simplicity of going back to the roots of the transference of knowledge as indigenous learners did prior to the imposition and influence of the federal government. ONYX will strive to enable the parent-teacher

organization to be active and fully engaged in our school. As a charter school, we will have the autonomy to implement many of the strategies outlined in this charter school proposal.

AT ONYX, Jeddito community children will be the primary focus to educate and given the tools and opportunities to carry on their heritage with a firm balance of the two worlds the students live in. It is important to identify that the responsibility of an educational organization goes beyond closing achievement gaps and test schools. As educators, the uniqueness to pass an understanding of an educational structure to a population of learners who are responsible, compassionate, culturally competent, and engaged in their own success as learners. ONYX will provide an environment that will foster growth socially, emotionally, spiritually, and academically.

ONYX will meet the expectations that are outlined in the mission statement.

1. To provide an educational foundation that nurtures *K'e* (relationship in Navajo culture), respect for self, others, and the environment.
2. To use natural traditional scientific skills passed on through Navajo culture.
3. To persevere through the perpetuation of Navajo culture and language with methodologies of M.A.T.S. (Mathematics, Arts, Technology, and Science).
4. To be more creative and develop skills that balances the understanding of the two worlds.

Academic Progress Goals

ONYX will work diligently to meet or exceed these targets as outlined below in our goals. We understand the importance of providing viable curriculum for all students, and meet the needs of all stakeholders with our school community. The mission will be

carried out to its fullest extent. ONYX will foster a learning environment conducive to its learners.

Academic Progress Goal 1

By year two, ONYX will meet or exceed Annual Measurable Objectives for all students, as established by Arizona Department of Education.

- Measure: AZ Merit

By year three, ONYX will meet or exceed Annual Measurable Objectives for all subgroups, outlined by Arizona Department of Education.

- Measure: AZ Merit

Academic Progress Goal 2: Literacy

By year two, all students at ONYX entering kindergarten will have a literacy plan based upon the results via teacher assessment and instruction.

- Measure: Phonographix

By year three, all students K-3 at ONYX will meet or exceed all benchmarks for grade level competency for literacy via teacher assessment and instruction.

- Measure: DIBELS/Grade

Academic Progress Goal 3: Math

By year two, all students of ONYX will meet or exceed all benchmarks for grade level competency in mathematics as measured by teacher assessment and instruction.

- Measure: Envision Math

Academic Progress Goal 4: Science

By year three, all students of ONYX will meet or exceed all benchmarks for grade level competency in science as measured by teacher assessment and instruction.

- Measure: Common Core Standards

Academic Progress Goal 5: English Language Development

By year three, the school's students making typical growth in English fluency based on age and prior fluency will be aligned with the state expectation for fluency attainment.

- Measure: Arizona AZELLA test

Organizational Strength Goals

ONYX will work closely with the community to adapt and build a system that will ensure low rates of absenteeism, high rates of parent and student satisfaction, and a fair pupil enrollment process.

Organizational Strength Goal 1

By the end of year three, ONYX will have improved rates of parent satisfaction, as measured by 10% increase (from baseline) in the percentage of parents responding *Agree* or *Strongly Agree* (e.g., survey question: "The school has high expectations for my child"; "My child is learning as much as he or she can at this school").

- Measure: Survey Monkey

Organizational Strength Goal 2

By the end of year three, ONYX will reduce rates of absenteeism by a 15% decrease (from baseline data in the chronic absenteeism percentage reported by the Arizona Department of Education-School Master data base).

- Measure: School Master

Educational Plans

Guiding Principles

The guiding principles of the ONYX Charter are as follows:

1. Student assessment is aligned with Common Core State Standards as well as with educational goals, and is used for evaluation of curriculum and instruction.
2. Aligning student assessment and teacher evaluation to mastery of the CCSS represents another step that ensures the CCSS standards are being taught in the classroom. The curriculum must be aligned with assessments and standard. This will determine if the chosen curriculum is having positive results based on student outcomes.
3. The ONYX School communicates with stakeholders about all student outcomes. Members must understand the mission of the school and share the vision and passion for student success, and have a personal stake in the performance of the school and its students. It is imperative that all stakeholders understand and have ownership of the ONYX mission and vision and the results are communicated.
4. ONYX creates and maintains an infrastructure that supports an accountability process.
5. ONYX School's infrastructure will support high quality education that prepares students by giving them the skills necessary to achieve. ONYX supports an accountability system with all stakeholders involved that promotes student learning and performance. Support is given to students, teachers, and school-based administrators based upon need and student/school achievement.

Research and Experiences

Research and experiences have informed the formation of these guiding principles:

1. To improve instruction and learner outcomes aligning assessments to CCSS is critical. Researchers have found that the use of assessment data informs what students know, what misunderstandings they have, and how they approach and work through problems. One study compared teachers across school districts, which revealed that those who used data from performance task items to inform instruction in their math classes showed dramatic increases in student achievement than their teachers' counterparts who did not use data. Programs monitored based on student assessment data have been documented substantially as being exemplary (Berman, Minicucci, McLaughlin, Nelson & Woodworth, 1995; Slavin & Calderon, 2001). For this status to be achieved, the data needs to be analyzed in order to utilize data-driven instruction adequately.
2. ONYX communicates with stakeholders about all student outcomes. Relying on research about best practices for overcoming communication failures, recommendations for school action to increase the effectiveness of communication practices to improve student outcomes are targeted towards the following:
 - Improving school-family communication
 - Improving school climate for family involvement
 - In-service programs focused on effective approaches
 - Developing strong in-school support for effective communication

3. ONYX School maintains an infrastructure that supports an accountability process.
 - ONYX Charter School will compare the traditional models of infrastructure in district and charter schools and model best practices on how to reframe the educational organization by putting best practices to use while putting support in place for accountability.
 - Direct links for excellent instructional practice
 - The assessments must be implemented in a systematic way and interpreted correctly, with professional development opportunities for teachers to perform adequately. (Lindholm-Leary & Herggett, 2007)

Examples of How Each Principle Will translate Into Actions and Decisions at

ONYX Academy

1. Student assessment is aligned with Common Core State Standards as well as with educational goals, and is used for evaluation of curriculum and instruction.

Example: at ONYX, developing and identifying both formative and summative assessments will be based on Common Core Standards being addressed in a particular classroom. School-based initiatives, planning time, professional development will be predicated on the implementation of the Common Core State Standards.

2. ONYX Charter School communicates with stakeholders about all student outcomes.

Example: ONYX School will communicate student outcomes by parent teacher organizations, board meetings, and staff meetings. To improve student achievement communicating student outcomes will give the opportunity for all to have voice in the outcomes.

3. ONYX Charter School develops and maintains an infrastructure that supports an accountability process.

Example: ONXY School will have a clear organizational structure with outlined frames within the structure. A defined infrastructure will enable the organization to have a procedural accountability process. This creates a culture and climate of shared leadership by building capacity.

Models

ONYX Charter School has applied the following organizations as resources to drive our guiding principles:

1. The Center for Applied Linguistics has put forth *Guiding Principles for Dual Language Education* (Howard, Sugarman, Christian, Linholm-Leary, & Rogers, 2007), which provides the reader with evidence-based principles that have demonstrated success in schools providing dual language education:
 - Assessment and Accountability
 - Curriculum
 - Instruction
 - Program structure
 - Staff quality and professional development
 - Family and community
 - Support and resources
2. The Center for Advanced Research and Language Acquisition (CARLA) is one of the Department of Education's Title VI National Language Resource Centers, whose role is to "improve the nation's capacity to teach and learn foreign languages" (CARLA, n.d., <http://www.carla.umn.edu/>). CARLA provides professional development and educational opportunities to educators interested in providing content-based language instruction with technology. ONYX will

incorporate and align with the mission and vision. CARLA provides instructional modules for curriculum development, instructional strategies, and student assessments in their professional programs. ONYX intends to utilize their practices into our institution.

Curriculum and Coursework

Table 1 lists the course offerings:

Table 1

Course Offerings

Grace level	Course offerings
Kindergarten	Science, Mathematics, English Language Arts, Social Studies, Art, Physical Education, Navajo Integrated Arts, Navajo Language and Culture (Appendix A).
First Grade	Science, Mathematics, English Language Arts, Social Studies, Art, Physical Education, Navajo Integrated Arts, Navajo Language and Culture (Appendix A).
Second Grade	Science, Mathematics, English Language Arts, Social Studies, Art, Physical Education, Navajo Integrated Arts, Navajo Language and Culture (Appendix A)
Third Grade	Science, Mathematics, English Language Arts, Social Studies, Art, Physical Education, Navajo Integrated Arts, Navajo Language and Culture (Appendix A)

The ONYX Charter School Navajo Language Curriculum

The implementation of a Navajo language immersion component at the ONYX Charter School will align to the Navajo Language Curriculum to the Department of Navajo Education, Navajo Language Standards as well as the federal standards for teaching critical languages at an early age. The plan is to have a Navajo Language immersion class for grades kindergarten to third. The class will be taught half day of English and half day of Navajo (Figure 1).

The Navajo Language Immersion program is an enrichment model that challenges all students to become fluent in two languages. The classes are taught by two teachers, one who speaks Navajo and one who speaks English. There is no translation of repeated lessons. The effectiveness of immersion language extends beyond the academic outcomes.

In Grades K through 2, 50% of the daily instruction is in Navajo and 50% in English. We will use the Balanced Literacy model to instruct Navajo language. During the Guided Reading time, the students will be broken into smaller groups/workshops, working together on various content areas, including art, social studies, music, to develop their listening, speaking, reading, and writing skills. Cooperation is a formal part of the curriculum of Balanced Literacy framework, “pair share,” with students teaming up and turning to a designated buddy for a lost word or concept.

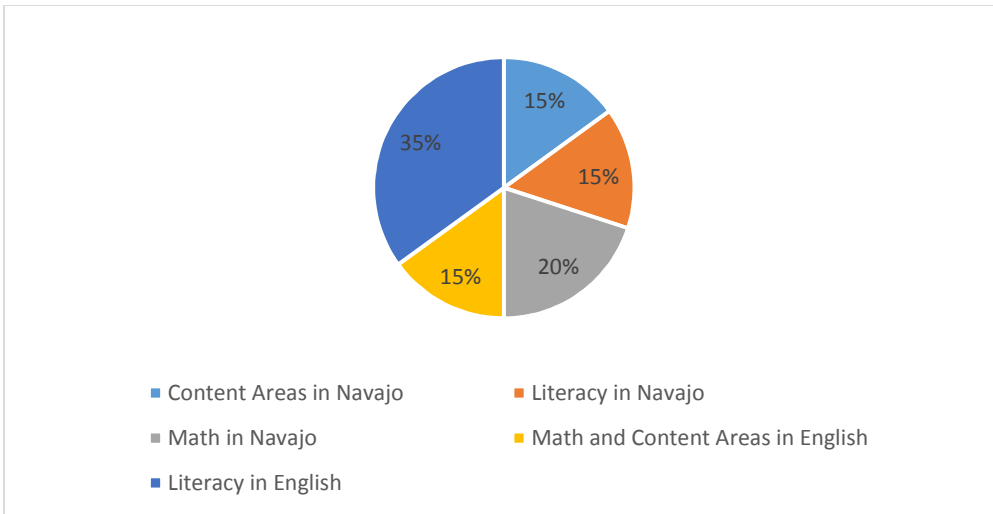


Figure 1. Navajo immersion instructional time: Grade K-2

In Grade 3, we will continue the same model, with the focus on content knowledge (Figure 2). Our students will have two classrooms, an English environment classroom and a Navajo environment classroom, with two different teachers. High-quality language arts instruction is integrated into thematic units. Students will start the day in the English classroom studying English language arts and science, and then in the afternoon work in the Navajo room studying Navajo language arts, math, and social studies/culture. The program will allow them to focus on the same grade level, core academic content in two languages.

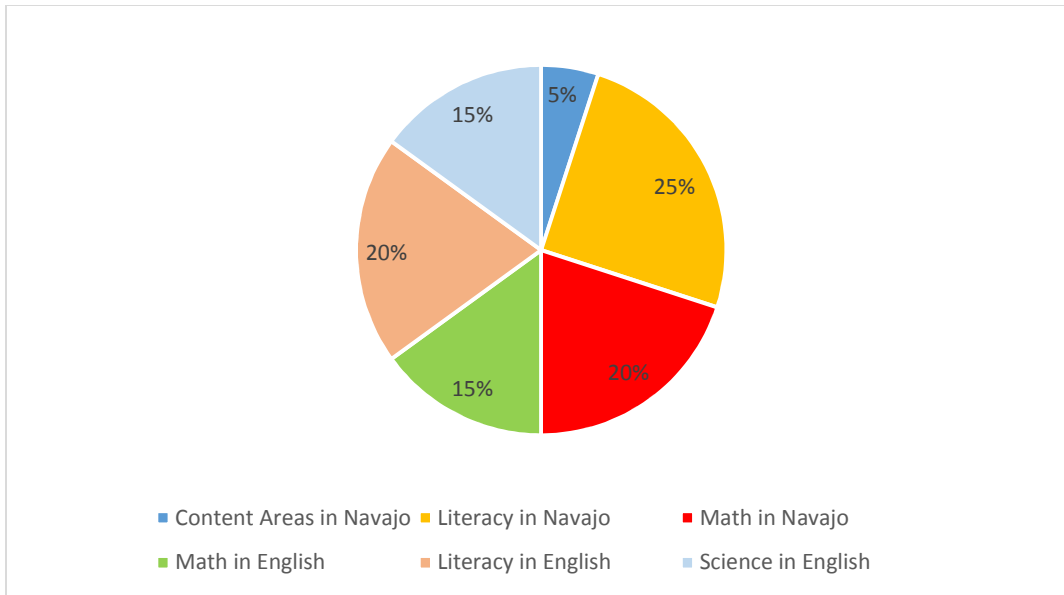


Figure 2. Navajo immersion instruction time: Grade 3

The ONYX Literacy Curriculum

For reading, writing, speaking, and listening, a balanced literacy curriculum will be implemented. This is a curriculum that will support students and nurture their academic development as it is aligned with our mission. Balanced literacy focuses on using reading-aloud, phonics instruction, small-group instruction, and shared reading and writing in addition to whole group mini-lessons in reading or writing workshop structures. The integrated use of these structures in a balanced literacy curriculum provides students with instruction in decoding, comprehension, phonemic awareness/phonics, vocabulary, and fluency. This curriculum approach looks at developing all students to become strong readers and capable writers, and it requires multiple approaches:

Programs should acknowledge that systematic phonics instruction is a means to an end. Some phonics programs focus primarily on teaching children a large number of letter-sound relationships. These programs often do not allot enough instructional time to help children learn to put this knowledge into use in reading

actual words, sentences, and texts. Although children need to be taught the major consonant and vowel letter-sound relationships, they also need ample reading (in uncontrolled text; i.e. NOT decodable text) and writing activities that allow them to practice this knowledge. (Hudson, High, & Otaiba, 2007)

Indeed, well thought-out strategies have been shown to be the most effective and will be what ONYX uses:

The Nation Reading Panel says using multiple strategies to understanding finds considerable scientific support for its effectiveness as a treatment, and it is most promising for use in classroom instruction where teachers and readers interact over text. (National Institute of Child Health and Human Development, NICHD).

ONYX's literacy model includes three strategies of mini-lessons, differentiated workshops, and reflection meetings.

Students' diverse needs are met through the workshop instructional model which offers opportunities for whole group, small group, and one-to-one instructional time. The balance of the mini-lesson, differentiated workshop core and reflection meeting for content development using skills and strategies is key. The mini-lesson offers students direct instruction on an explicit strategy or skill. "The teaching of each strategy should be explicit and intense and should include substantial opportunities for meaningful practice and application." (Rosenshine, Meister, & Chapman, 1996)

The ONYX Science Curriculum

ONYX Charter school science curriculum will be designed to engage students in hands-on inquiry based investigation of science in physical, earth, and life sciences.

"Hand-on/minds-on science provides a real world context, a catalyst for learning, and natural opportunities to develop accurate and effective scientific communication"

(Science and Literacy Integration Project). ONYX Charter School will incorporate

Navajo Culture science activities that are aligned to Navajo Nation Department of

Education Navajo Science Curriculum standards. The design includes these pedagogies.

- Active investigation, including outdoor experiences
- Recording in science notebooks to answer the focus questions

- Comparing Navajo and Western educational science projects to balance an understanding and alignment of both structures.
- To progress monitor assessment and motivate student reflection and learning using Navajo pedagogy of learning by inquiry and hands-on.

We will work to develop a clear link between the language arts and science education so that learners in inquiry-centered classrooms regularly work together to question plan, test, ideas, read, write, draw, listen, and speak as is expected in the Common Core State Standards. There is a continuum designed to maximize every student's opportunity to learn. So an instructional sequence can move from one pedagogy to another and back to ensure adequate coverage of the concepts in Navajo and English.

The science curriculum will be revised and deepened to draw from areas outlined in M.A.T.S. education (Mathematics, Arts, Technology and Science). The extended day and Friday exploration will reinforce the M.A.T.S. area. Around the country technology and science are being integrated into the school day beyond the science time because of a national push.

The ONYX Social Studies Curriculum

ONYX Charter social studies curriculum will be grounded in the value and importance of Navajo culture aligned to global cultural diversity. Social studies is a place for students to learn and explore their own Navajo backgrounds, histories, and development of members intersecting cultures and heritages.

The inquiry-centered philosophy, ONYX social studies curriculum will be designed to engage students in inquiry approaches by looking at themselves and the world around them, as well as analyzing events from the past. The curriculum integrates

reading and writing, moving from concrete skills and concepts of speaking and listening to engagement of citizenship. The curriculum will be developed in collaboration with staff and community. The curriculum will be aligned to the Navajo Nation Navajo language social studies curriculum and to the National Council for the Social Studies (NCSS) curriculum standards.

The standards for social studies are grouped in 10 strands by the NCSS. The curriculum provides the following studies:

1. *Culture*: Social studies program should include experiences that provide for the study of culture and cultural diversity;
2. *Time, continuity, and change*: Social studies programs should include experiences that provide for the study of the past and its legacy;
3. *People, places, and environments*: Social studies programs should include experiences that provide the study of people, places, and environments;
4. *Individual, development, and identity*: Social studies program should include experiences that provide for the study of interactions among individuals, groups, and institutions;
5. *Individuals, groups, and institutions*: Social studies programs should include experiences that provide for the study of interactions among individuals, groups, and institutions;
6. *Power, authority, and governance*: Social Studies programs should include experiences that provide for the study of how people create, interact with, and change structures of power, authority, and governance;

7. *Production, distribution, and consumption*: Social studies programs should include experiences that provide for the study of how people organize for the production, distribution, and consumption of goods and services;
8. *Science, technology, and society*: Social studies programs should include experiences that provide for the study of relationships among science, technology, and society;
9. *Global connections*: Social studies programs should include experiences that provide for the study of global connections and interdependence; and
10. *Civic ideals and ONYX Charter*: Social studies programs should include experiences that provide for the study of the ideals, principles, and ONYX Charter practices of citizenship.

The ONYX Mathematics Curriculum

The ONYX math curriculum will be hands-on, interactive, and inquiry-based, with an emphasis on problem solving within thematic units of study. The development of conceptual understanding of mathematics will be implemented so students will understand and move from the concrete to abstract. The curriculum will support students to independently apply their understanding of mathematics to real world and academic situations.

The ONYX Charter will use a math framework that is data centered. A supplementary program such as Contexts for Learning, an independent study from the state of Washington’s Office of Superintendent of Public Instruction’s review of supplementary math program for teaching strategy development, was considered “the best supplementary math program for teaching strategy development.” This study also

found the Contexts for Learning Mathematics was “ recognized as one of the best math supplemental math programs for meeting the diverse needs of today’s contemporary classroom,” including ELL students and culturally diverse schools that need culturally responsive math instruction (Washington State Office of Superintendent of Public Instruction, 2007).

Best Practices that Support our Curricular Plan

ONYX students will be engaged in an inquiry-approach where maximizing student learning is at the forefront during all instructional times. In using a workshop instructional model, it will be a balance of the delivery of instruction to students between whole group, small group, and individuals to ensure that each individual learner receives appropriate instruction that is based on assessment data (Table 2).

Table 2

Best Practices

Instructional strategy	Required Y/N	School-wide or grade levels
Focus and effective mini-lesson structure that includes modeling and demonstration of teaching point	Y	School-wide
Teacher conferring with students to inform differentiation and push students forward	Y	School-wide
Flexible, small group instruction across content areas	Y	School-wide
Think-pair-share, interactive read-alouds, and participatory strategies	Y	School-wide
Workshop core that provides independent time for students to apply teaching point	Y	School-wide
Daily reflection on learning	Y	School-wide

ONYX Charter classrooms will all follow the Workshop Model, which will allow teachers to meet the individual needs of each and every student. Every classroom will utilize all the same instructional methods. The school-wide commitment to the instructional methods and strategies will ensure students will be very familiar and comfortable with the structures and procedures. This allows for the teachers to start new concepts faster and spend less time on review.

Learning Environment and Pedagogy

Our purpose is to role model and nurture respect through *K'e* (Navajo culture) and to provide a balanced educational foundation for our children using the Dine pedagogy. The program is student-centered. The teacher's emphasis is what the student is learning,

how the student is learning, the conditions under which the student is learning, and how current learning positions the student for future learning.

The educational philosophy is to use the Workshop Model across content areas to develop students' proficiency and mastery of content, strategies, and skills to nurture and develop children academically. Whole-group instruction, with small-group time, and independent practices are blended into the classroom every day.

ONYX Charter will prepare its students to be productive globally by providing skills to achieve the 21st goals:

- Active learning
- Problem solving skills
- Critical thinking
- Communicating, creating and expressing in a variety of ways
- Contextualized knowledge, which is meaningful and can be retained

Teachers are encouraged to use the following strategies:

Collaborative teaching/learning: To work closely with grade level and content areas, to plan, share, and solve problems.

Open-ended questioning: This will lead students to think critically, discuss, and debate in the classroom.

Demonstrating: Model as to how students will observe and perform the skill from each other.

Gaming: Enhances performance, reinforces content understanding and skill practice.

Graphic organizers: It provides visual aids to facilitate learning and instruction. It helps students to understand concepts and the relationships.

Immersive environments: In the Navajo Immersion classroom, students will speak, hear, write and read only Navajo. Students will gradually become fluent in speaking and reading Navajo. The brains of balanced bilingual children are challenged to develop simultaneous connections between multiple representations of items. The results are superior cognitive skills.

Problem solving: The curriculum will integrate problem common interdisciplinary areas to allow students to strengthen creative and critical thinking skills.

Brainstorming: This will allow for refining the definition of a problem, generating multiple solutions.

Student presentation: Through research peer learning is an active learning strategy that results in large gains in learning. Students are provided opportunities to practice and improve communication skills.

Specific Population

The ONYX has an expectation that students will learn with high rigor in each classroom. All students can make gains. All students are at different levels of learning. Many students are often identified in needing an Individualized Educational Plan (IEP) that are specific to their needs. There is no account taken for the different types of learning styles. Teachers would be encouraged to create flexible groupings for remediation and acceleration.

There would be a Teacher Support Team (TST) that will allow for teachers to share best practices around core academics.

1. For struggling students
2. For students learning English
3. For students with disabilities
4. Gifted and advanced students

Assessment System

ONYX Charter will develop an assessment in Navajo during the planning year of 2016 to 2017, an assessment of mastery of grade specific for core content areas. The assessment system will be integrated into the instructional approach and will guide quick responses in the classroom, support services, and school levels to ensure that resources are to support student achievement.

Formative assessments will be used by classroom teachers daily. This will gauge student progress and adjust instruction. Interim quarterly assessments will provide a more comprehensive overview of students' performance in reading, writing, math, and science.

Promotion

Students will be promoted to the next grade if they possess the skills and knowledge appropriate for their grade levels as demonstrated in multiple measurements. Chronological age, attendance, and social maturity will also be determining factors of promotion. There will not be a single measure that will qualify for a student promotion or retention. The families of ONYX will be a part of the process. There will be four marking periods each school year. Students will receive a report card at the end of each quarter; this will inform the students' performance on Common Core grade level standards and include narratives on students' social-emotional progression.

School Culture

When referring to climate, we are referring to the attitude of an organization; this encompasses the mood and morale of people. When referring to the culture of an organization, we are referring to a common set of expectations, and the way of doing business and disseminating information throughout the organization.

ONYX will constantly assess the climate and culture by having faculty, staff, and students' families relate their experiences so everyone's voice is heard. This is a form of perception data collection, which will help in creating a shared vision, and foster the mission. ONYX will have regular faculty, student, and parent meetings in various areas in the school where stakeholders feel comfortable. The following are goals at ONYX:

- *Creating balanced communities:* Modeling respect; everyone's voice is heard.
- *Supporting students and teachers:* Surveys will be given to stakeholders to identify areas that might be challenging and work diligently to address the changes.
- *Enforce the Golden Rule:* Be conscious of how we treat one another and use the information to create a better climate and culture.

Our purpose is to provide an educational foundation that nurtures *K'e* (relationship in Navajo culture), respect for self, others, and environment, most importantly to use natural/traditional scientific skills passed on through Navajo culture. ONYX will prepare students to persevere through the perpetuation of Dine (Navajo) culture and language with methodologies of M.A.T.S. (Mathematics, Arts, Technology, and Science). This will lead students to be more creative and develop skills that balances the understanding of two the worlds. O.N.Y. X. will prepare its students to be productive

citizens in society via a curriculum that allows for students to perpetuate Dine culture and language via a curriculum embedded with M.A.T.S. foundation. This will lead students to think creatively and develop strong skills to balance and survive in two worlds.

CHAPTER 4

SUMMARY AND CONCLUSION

The purpose of this study was to create a new school model for Dine (Navajo) learners where Dine students will experience how to apply knowledge and skills personally, meaningfully, and socially relevant to life situations through the medium of Dine language and culture maintenance. Our Dine children are precious and worth the ideology of seeking an innovative school derived as a charter school with a foundation of traditional Dine methodologies that align with STEAM education renamed M.A.T.S. for this research document. This study explored a new way to perpetuate Dine (Navajo) culture and language through a model titled M.A.T.S, a school on the Navajo Nation. The research supported the need to develop a model called M.A.T.S. school for the Navajo Nation.

The leading research question states, how can the model M.A.T.S. school on the Navajo Reservation perpetuate Dine culture and language for its learners? The sub-questions are listed as follows:

1. What are the main principles of STEM and STEAM education?
2. How do STEM and STEAM principles remedy Dine culture and language pedagogy?
3. How do charter schools support flexibility, innovation, and autonomy of choice?
4. What would a model M.A.T.S. school on the Navajo Nation look like with a focus on perpetuating Dine culture and language?

The study utilized an action-research model to provide an intricate view of the Dine (Navajo) Educational Journey with policy and theory and to shed light on the need to change the Navajo educational structure by developing a charter school plan that supports perpetuation of Dine Culture and Language and the use of Navajo pedagogy, the foundation of Navajo learning by implementing Navajo science teaching in a natural traditional Navajo approach along with *K'e* (relationship in Navajo Culture), respect for self, others, and environment. This study indicated there was a need to create a different type of learning environment for the Navajo learner.

Conclusions

“From mother earth we are formed, from father sky we descend. Our journey is the ray of light—the embodiment of female and male rain. Within us we are a pure beam of light traveling through time.” *Bila'ashdla'ii—Naabaahii Dine*

In providing information of STEM and STEAM education in the 21st century, the foundation of STEM and STEAM is identical to Navajo pedagogy of learning through a natural traditional Navajo approach of learning science. The fabric of being Navajo from living in a traditional Hogan to weaving an intricate rug has all the components of M.A.T.S. education with inquiry-based, hand-ons, and minds-on educational approach. It is behooving as to why as a People, the Dine, we have allowed the federal government to make an educational structure that is not conducive to our Navajo learners. The current educational structures on the Navajo Nation do not allow for perpetuating Dine culture and language within the schools. Furthermore, it places the Navajo's scientific approach of learning on the back burner and places the current system on a pedestal. The Dine educational journey was not a plan that we as a people concurred on; it was a form of schooling that was imposed since “The Long Walk,” 1868. The irony is we supported the

education of Navajo children since the Treaty of 1868 in the wrong direction with no end in mind. Therefore, it is time that we take the reins of Navajo education and incorporate our own Dine pedagogy of learning.

Our Dine pedagogy incorporates a holistic view of life, starting with *K'e* (relationship in Navajo Culture), respect for self, others, and environment. Because many Navajo children are allowed to explore their environment through the use of relationships with family, this is how a Navajo child is nurtured and molded into respecting themselves and others. The prayers of the Navajo medicine men and women describe nature in its entirety from the earth, sky, constellations, and the universe. The Navajo culture and language standards are aligned to this pedagogy of teaching. However, minimal use of the standards are used throughout schools on the Navajo Nation.

For a school on the Navajo Nation to incorporate innovation, flexibility, and autonomy for its Navajo learners, a new form of school structure has to be developed and implemented. The history of charter schools nationally has given many rural and urban schools a true focus on student-centered education versus a federally mandated school structure. The innovation of a charter school is in the mission and the focus of a unique type of education nothing similar to the status quo. For the Navajo children this means to hold on to our culture and language with a fusion of M.A.T.S. education to balance the western educational philosophy of learning with Dine educational philosophy of learning.

The ONYX Charter School Plan is a confirmation that we have to strive to improve our own education as Navajo, so our children can be successful in their pursuit of happiness. The Dalai Lama said it best: “When educating the minds of our youth, we must not forget to educate their hearts.” When a school plan such as the ONYX

incorporates the foundation of Navajo Culture with *K'e* (relationship in Navajo Culture), respect for self, others, and environment. The ONYX's mission is to perpetuate Dine culture and language at the kindergarten through third-grade level.

The Next Steps

To share the plan of ONYX with my community of Jeddito, and the Navajo Nation Department of Education, there could be two approaches to have ONYX become a school on the Navajo Nation. One option is to apply for a Charter Grant through the Arizona Charter School Board. The timeline is a year cycle with sustained funding by May of each year and using the startup funding for the next 18 months to create the school outlined in ONYX. Along with the funding (grant monies) the charter school has to be approved by a charter board. Arizona State University is one that can certify a charter school; the other is the Arizona Board of Charter Schools.

Secondly, a plan would be to use a newly introduced bill, Native American Education Opportunity Act (*Navajo Times*, 2016), to pursue a charter school model such as ONYX on the Navajo Nation with the support of the Navajo Nation Department of Education, Navajo Nation Schools Superintendent, and the Dine Bi Olta School Board Association. There are always negative and positive views of something new and innovative especially if it involves children. As a people, The Dine, we know that our current systems of Bureau of Indian Education schools, public schools, tribal grant schools, and private schools follow a formula that has absolutely failed our children.

Globally, charter schools that have been developed to support indigenous learners have been very successful and have become models, such as charter models seen in Hawai'i, First Nations—Canada, and Maori—New Zealand. The ONYX would be the

first Charter K-3 Model for the Navajo Nation upon opening its doors. There are many rural locations on the Navajo Nation that can benefit from the ONYX model. It has the mind of a Dine (Navajo) and the heart of its children in mind.

Concluding Remarks

Kinyaa'aanii (Towering House), *Nishli*, *Dzil Ghaa'i Shash Dine'e* (White Mountain Apache Bear Clan), *Bashishchiin*, *Tabaahi* (Edgewater people), *da shicheii*, *Dzil Ghaa'i Shash Dine'e Dashinali* (White Mountain Apache Bear Clan), *Gah Todee' Naasha* (I am from a place called Rabbit Springs from the community of Jadito, Arizona). *Shimasani ei Katie Martin Duffy Baahii (Bahe) wolye nit'ee'* (My maternal grandmother's name was . . .) *doo Shicheii ei John Naabaahii (Bahe) wolye nit'ee'* (My maternal grandfather's name was . . .) *Shinali asdzaan ei Ramona Beatty wolye* (My paternal grandmother's name is . . .) *doo Shinali Hastiin ei Homer Beatty wolye*. (My paternal grandfather's name is . . .). *Kot'eego eiya Naabaahii Asdzani nishli* (I am a Dine Woman Warrior every day.)

I am a blessed Dine (Navajo) and half Apache woman to take this journey of education from the day my grandparents brought me home to *Gah To*, Arizona. I was given a great foundation of learning that perpetuated and resonated on a daily basis of Dine language and culture, the guidance and nurturing of loving grandparents Katie and John Naabaahii. It is because of that foundation and my personal educational journey that I know the ONYX is the answer for our Navajo educational system and our Navajo children.

The many rugs that were woven by my grandmother, I observed, assisted in gathering the plants that made the many dyes that give a Navajo rug life and purpose; from the raising of lambs, to shearing them, to cleaning the wool, spinning the wool, carding the wool, and the final process of dyeing the wool for the purpose of making an intricate Navajo rug. I observed many generations of *Kinyaa'aanii* women designing rugs

that I saw being created by my grandmother. We, the *Kinyaa'aanii* clan, were the first clan made for the Dine (Navajo). Bestowed upon us was the gift of being a leader for the people, to help guide and nurture, to be the voice of reason and articulation for generations to come. This is who I am as a *Naabaahii—Kinyaa'aanii*—kind hearted, and able to lend a hand to help others. These values I learned from my grandmother, mother, and aunts.

The Navajo culture and language make up the sustenance to our way of life. *Cheii John Naabaahii a Tabaahi* taught from many stories the creation of our people: *Hajineidee' Hane'* (creation story of the Navajo), *Haigo Hane'* (winter stories), *Na'asho'ii Dich'izhi* (Grandpa horned-toad), *Ya* (sky), *Nahasdzaan* (earth), *Nanise'* (plant life), *Naaldlooshii* (animals), *So'* (stars and constellations) and many more. It is from this foundation of storytelling that songs, prayers, and respect of being a Dine come from. The male and female teaching in Navajo has to remain balanced. For too long we as a Navajo people have resonated to one side. Therefore, in purposing ONYX it will give a balance of both kinds of Navajo cultural teaching to our Navajo students.

In completing this dissertation, I have brought balance within and for our Navajo children. It is up to all Navajo educators to improve education for the generations to come. If Navajo people were raised traditionally, our grandparents taught us not to plan for tomorrow, next month, next year; they taught us to plan for years down the road 10, 20, 50, 100 years. Grandparents, stated this belief:

In a blink of an eye we are born and then we become old. There is no time to waste, we are all precious as humans, don't take life for granted. Our journey as human beings is unknown, use your teachings to guide and make decisions to help many generations of children.

My job to live up to my teachings passed on to me by my grandparents begins
now with ONYX, as my cane.

*Yoolghai Saad, Dootl'izhii Saad, Dichili Saad, Baashzhinii Saad k'ehgo
shanididooleel diyin dine'e. Hozho Na'hasdlii', Hozho Na'hasdlii', Hozho
Na'hasdlii', Hozho Na'hasdlii'.* (A Navajo Prayer to complete this task and start
anew)

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APPENDIX A
SAMPLE LESSON PLANS

Sample Lesson Plan—Kindergarten

- ❖ Introduce Lesson- Five senses centers outside the classroom
- ❖ Vocabulary *shinaa* '/eyes/sight, *shijaa* '/ears/sound, *shichiih*/nose/smell, *shizhee* '/mouth/taste, *shilaa* '/hand/touch.
- ❖ Students will explore the five senses through sensory in the outdoor environment, visit a traditional Hogan (hooghan), Elderly teacher to teach respect self through use of five senses.
- ❖ At each center get items that relate to Navajo Science (e.g., sound—traditional music, touch—water, sand, smell-plants, taste-traditional foods).
- ❖ Storytelling about the Navajo importance of taking care of your five senses
- ❖ Sing a traditional song about five senses
- ❖ Navajo/MATS Challenge: Students will draw a picture of their body and identify how they are able to use their five senses to explore their environment and sing or chant a simple traditional song about taking care of self.

Sample Lesson Plan—First Grade

- ❖ Introduce lesson with a PowerPoint
- ❖ Vocabulary words *Naaldlooshii Tl'eego naakai'igii doo Jiigo naakai'igii, Haigo Hane'* /Winter Stories, *Keeshjee'*
- ❖ Navajo/MATS Challenge: Search with a parent and a flashlight around your home. Draw all of your nocturnal animals you find on your search. Identify in Navajo using a complete sentence to describe the animal and draw a picture.
- ❖ Identify what one special adaptation you need to be nocturnal? Design some sort of technology for humans to adapt to nighttime activity.
- ❖ Present what adaptations do animals have and allow them to function at night?
- ❖ What power did you need to give humans so they could function at night?
- ❖ How did your technology allow humans to have this adaptation?
- ❖ Tell a Navajo Story about adaptation and environment—*Nee'eeshjaa' Bahane'*
- ❖ Learn the day and night song for all animals (Naaldlooshii)

Sample Lesson Plan—Second Grade

- ❖ Introduce lesson—with a PowerPoint—Habitats
- ❖ Vocabulary Navajo/English- *Habitat/Hooghan Binaago, Chi 'yaan*-food, *Hooghan*/Home, *To*/water, *Naaldlooshii*—animal.
- ❖ Navajo/MATS Challenge: Your team will be assigned an animal to build a habitat for (e.g., horse, sheep, prairie dog, mountain lion, bear)
- ❖ Identify the needs of your animal through the habitat. Travel to an area in the community that has a variety of habitats for animals.
- ❖ Create a pattern to camouflage your animal
- ❖ Learn a traditional song about animals, *naaldlooshii*, if in the winter sing *keeshjee' sin*.
- ❖ At the end of the project students will be able to:

M—I can create patterns to camouflage the animals;

A—I can draw the habitat and animal;

T—I can use a digital camera to take a picture of the habitat;

S—I can tell needs met by an animal's habitat;

- ❖ After you have built your habitat, your animal will write a letter telling you what needs have been met and what you might rethink.

Sample Lesson Plan—Third Grade

- ❖ Intro Lesson—with a PowerPoint —of local rock formations on the Navajo Reservation (e.g., Spider Rock—Canyon De Chelly)—Soil erosion—Field Exploration in the community to identify land formations.
- ❖ Vocabulary Navajo/English –Tse—rock, Leezh—sand, Niyol—Wind, To—water, Nahasdzaan—materials from Earth, minerals from Earth
- ❖ Traditional minerals—4 directions—white shell, turquoise, abalone, black jet
- ❖ What objects in our lives that come from the Earth (materials)? (e.g., paper, clothes, plastic, glass)
- ❖ Navajo/MATS Challenge: In groups of 3-4 you will build an Earth dwelling (home made from Earth’s materials). We will test it to see if it can stand up against wind and water weathering. Presentation in Navajo with proper identification items in Navajo.
- ❖ Learn *Hooghan Biyiin* (Navajo song for home)as students build dwellings/ visit a traditional Hogan
- ❖ Pictures/Examples of various dwellings.
- ❖ Materials Needed: Sand, Clay, Soil, Sticks, Water, bucket
- ❖ Testing: Wind Weathering: The Fan Test!
Water Weathering: The Strainer Test