IMPROVING AMERICAN INDIAN STUDENT OUTCOMES IN MINNESOTA PUBLIC SCHOOLS

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DISCLAIMER

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy, University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgements and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other agency.

HONOR STATEMENT

On my honor as a University of Virginia student, I have neither given nor received unauthorized aid on this assignment.

Allie Strehle
April 09, 2021

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EXECUTIVE SUMMARY

Minnesota American Indian students are experiencing the achievement gap in their public school education higher than any other minority demographic. American Indian students have the lowest four-year high school graduation rate of all racial and ethnic groups (Minnesota SLEDS, n.d.). Despite having over 15,000 American Indian students in the Minnesota Public education system, support for these students remains low, and academic outcomes are highly disparate, indicating a broader achievement gap. These incongruent outcomes in academic and non-academic measures during school also indicate broader inequalities in higher education and workforce matriculation, and long terms social and economic outcomes.

Education jurisdiction is decentralized, with many parties impacting student experience. Programs, funding, and interventions span from federal, state, to local, with varying degrees of impact. Minnesota Department of Education's 2021 strategic plan is to "ensure every child in Minnesota receives a high-quality education, no matter their race or zip code" (Minnesota Department of Education, 2021). This report investigates ways MDE can implement changes to improve American Indian student outcomes and promote equity in public education.

The impact of low graduation rates creates significant impacts in the short and long term. The equity gap prevalent in Minnesota Public Schools further impacts matriculation to higher education and workforce participation. Further, high school dropout trends are associated with negative externalities in social welfare, health outcomes, with disparities accruing to many facets of American Indian's lives, post dropout.

American Indian students cite a variety of factors in dropout propensity. Generally, large schools, uncaring teachers, inappropriate curriculum, parent and community involvement level, and general apathy seem to play a factor. To mitigate dropout, programs have been developed to implement cultural and language relevance into schools, to promote academic and teacher success, and holistic programs that target the whole student experience. While there is limitation to applying the outcomes of these programs to current MDE public schools, lessons learned in reviewing the literature informed the development of alternatives.

The alternatives were evaluated based on their (1) cost-effectiveness, as operationalized through graduating high school, (2) equity, (3) political sustainability, and (4) implementation feasibility.

The primary policy alternatives considered here are:

1. Change teacher certifications
2. Expand Minnesota's Office of American Indian Education
3. Diversify Minnesota's Standards of Learning

The analyses conducted suggest diversifying Minnesota's curriculum and Standards of Learning showed the most promising outcomes based on the criteria. The next steps for the Minnesota Department of Education include implementing revisions to the current evaluation process of Minnesota Standards of Learning. This process begins at goal setting and committee selection formation, continues into the adoption of standards, and subsequently applying this to all subject curriculum reviews.

DEFINITIONS

Achievement Gap – A disparity in academic performance between groups of students, as shown through grades, standardized test scores, course selection, dropout rates, college enrollment and achievement, among other things (Ansell, 2004)

American Indian/Native American – These terms are used interchangeably, with the understanding that there is no single definition used by agencies, databases, or literature. Depending on the source, it can include individuals who self-identify as American Indians, to tribal members, to those having one-fourth or more American Indian ancestry (Minnesota Senate, n.d.)

Reservation – An area of land created through treaty, congressional legislation, or executive order, reserved for and managed by tribes (Minnesota Senate, n.d.)

ACRONYMS

AIPAC: American Indian Parent Advisory Committees
AP: Advanced Placement
BIE: Bureau of Indian Education
ESEA: Elementary and Secondary Education Act
ESSA: Every Student Succeeds Act
IB: International Baccalaureate
IEP: Individualized Education Program
MCA: Minnesota Comprehensive Assessment
MDE: Minnesota Department of Education
MIAC: Minnesota Indian Affairs Council
MIEA: Minnesota Indian Education Association
NAEP: National Assessment of Educational Progress
PELSB: Professional Educator Licensing and Standards Board
PSEO: Postsecondary Enrollment Options
RTI: Response to Intervention
SLEDS: Statewide Longitudinal Education Data System
TNEC: Tribal Nations Education Committee
TOC: Teachers of Color
TOCAIT: Teachers of Color or American Indian Teachers

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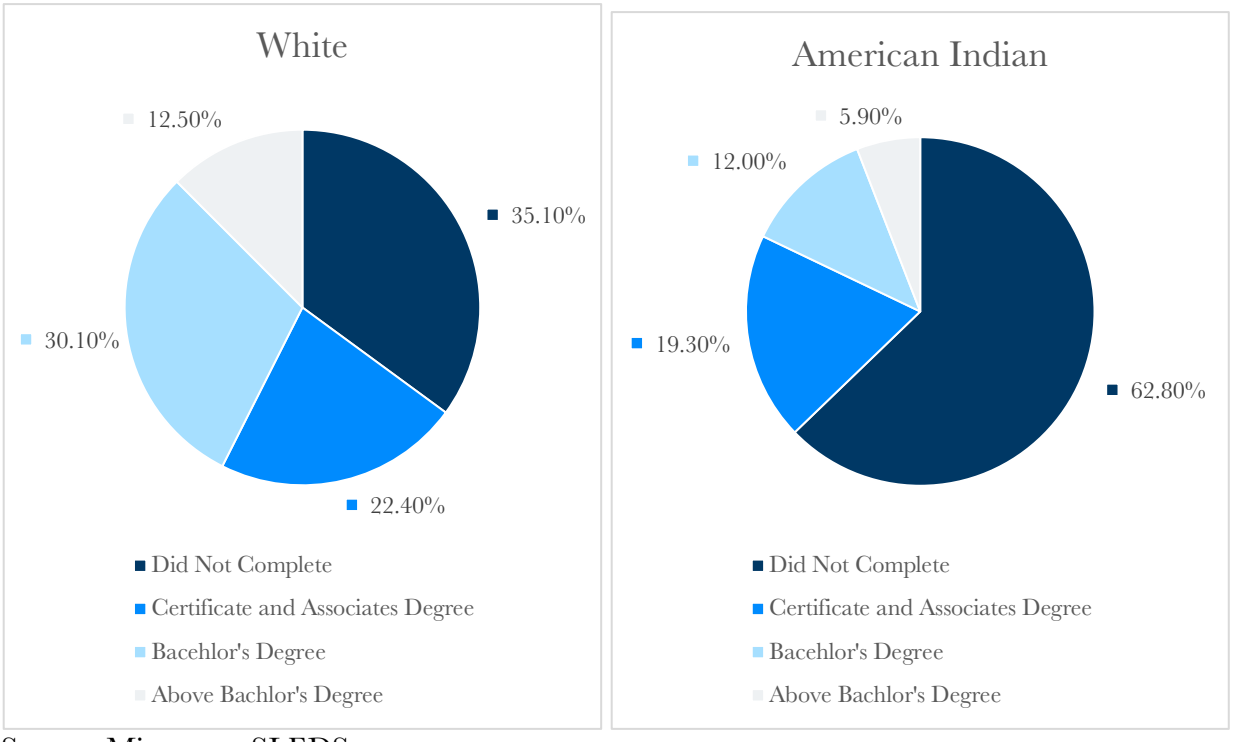
PROBLEM DEFINITION

Nationally, American Indian students have the highest dropout rate at 9.5% in 2018, compared to 5.3% on average (Hussar et al., 2020). This statistic is worse in Minnesota than the national average, with American Indian having the highest dropout rates, and lowest high school completion rates. **The 2019 four-year graduation rate for American Indians in Minnesota was a mere 51%, as compared to the state-wide average of 83% (Minnesota Department of Education, 2020). American Indians are the most underserved population in Minnesota's education system, resulting in the lowest rate of matriculation to employment or college one year after graduating from Minnesota Public Schools (Feygin et al., 2019).**

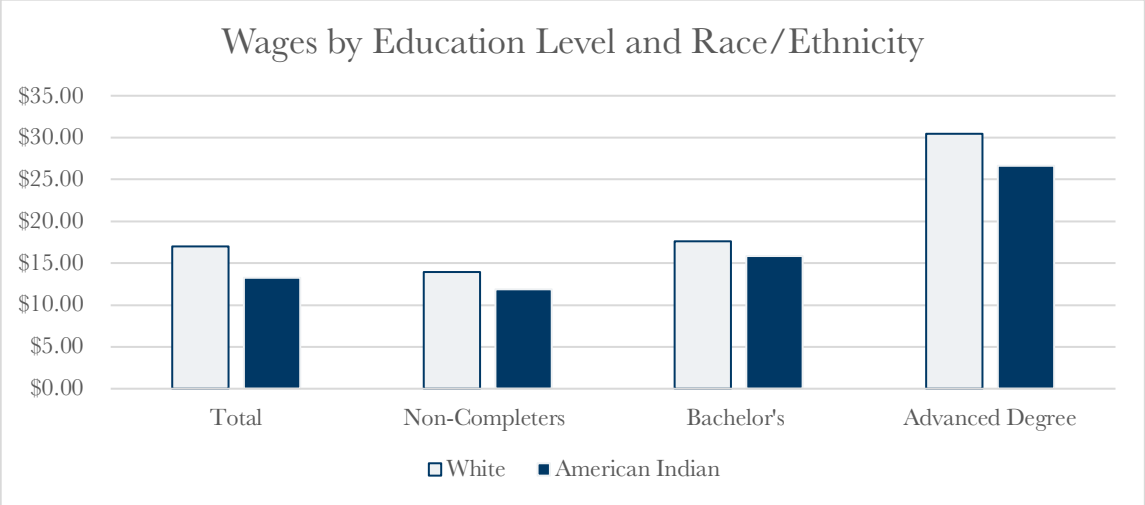
The achievement gap – especially in regards to American Indian students – can be demonstrated through disparities in standardized testing, attendance rates, graduation rates, and non-academic outcomes. These disparities have impacts on long-term outcomes, specifically matriculation to higher education and the workforce (Minnesota Department of Education, 2019). Figure 1 shows disparities in higher education matriculation and attainment, and Figure 2 shows disparities in wages (Leibert, 2018).

Figure 1. Educational Attainment by Race/Ethnicity, School Years 2006-2016



Source: Minnesota SLEDS

Figure 2. Wages by Education Level and Race/Ethnicity



Source: Minnesota SLEDS

The Minnesota Department of Education values a quality education for all and strives to solve the inequities persistent in public education systems around the country. Previous reforms and policies have done little to significantly close the gap, and it is clear additional efforts are required to support students. All students deserve access to an education system that supports them and prepares them for future success in continued education or the work force. Targeted interventions and policy change has the potential to benefit these students and make the Minnesota Education System a place where all students succeed.

BACKGROUND

American Indian Population in Minnesota

There are 11 tribal nations that share geography with the state of Minnesota: seven Anishinaabe and four Dakota. Current estimates suggest there are 168,465 Native Americans in the state of Minnesota, with 44.5% of Native Americans living in the Twin Cities, and 55% in Greater Minnesota (Minnesota Compass, n.d.). A 2019 survey by the Minnesota Department of Health revealed the primary tribal affiliation of these students are Anishinaabe/Ojibwe, with other large percentages coming from Dakota/Lakota tribal affiliations (Minnesota Student Survey Interagency Team, 2019). The average household income for American Indian residents was $43,438 in Minnesota, with only 16.6% of households making $100,000 or more (Minnesota Compass, n.d.). Additionally, around 12.5% of the Native population 25 years and older have less than a high school degree, as of 2017, and less than 65% of working age adults are employed (Minnesota Compass, n.d.). Education is both a symptom of and factor in larger inequities experienced by American Indians in Minnesota and around the country. Figures 3 and 4 show the location of Indian reservations in Minnesota and American Indians a s a percent of county population (MN House Research, 2020).

Figure 3. Minnesota Indian Reserves

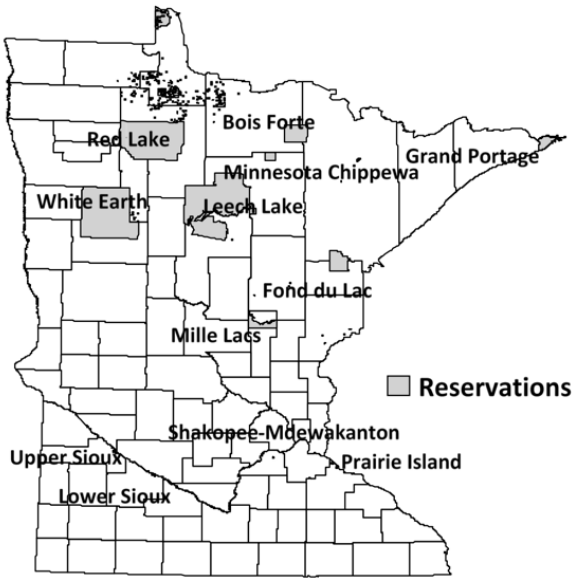
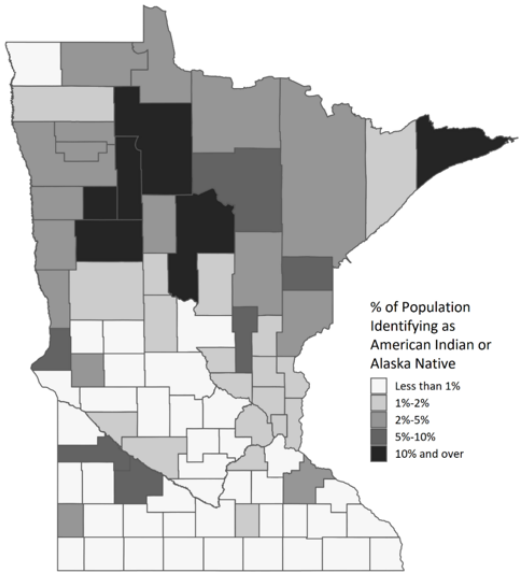


Figure 4. American Indian Population



Map by House Research.
Source: American Community Survey 5-Year Estimates 2013-2017.

Client Discussion

Within Minnesota, the goal of American Indian Education is "to provide American Indian students with positive educational opportunities, and to assure that American Indian students will reach their full potential within their school communities through meaningful, equitable, and targeted educational experiences that affirms and values their unique cultural identities (Minnesota Department of Education Data Center, 2021). While many different entities have jurisdiction over this issue, the Office of American Indian Education within the Minnesota Department of Education is the primary oversight to ensure American Indian student

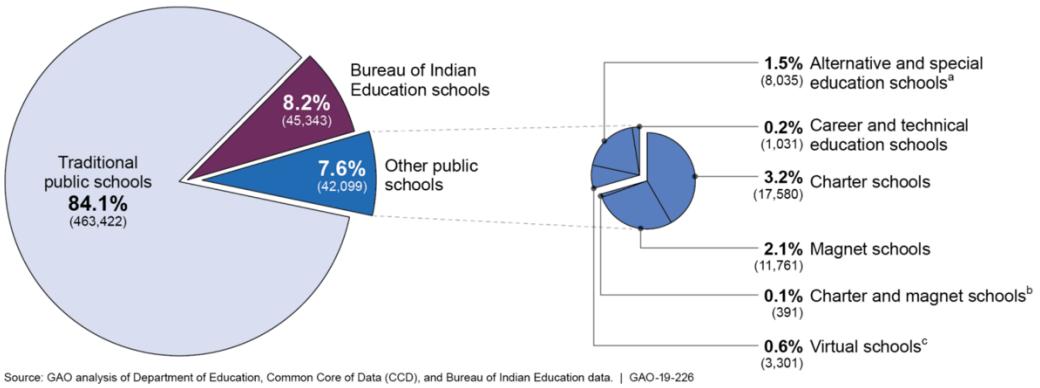
success. The Office of American Indian Education "works to strengthen and promote positive experiences and educational outcomes for American Indian students statewide" (Minnesota Department of Education, n.d.). This office also oversees the educational relationships with the 11 Sovereign Nations in Minnesota.

While MDE aims to prioritize a quality education for all, significant barriers have prevented American Indian students from achieving at the rate of their peers. MDE's stated goals in 2013 legislation emphasize success for all students: 1) all children are ready for school, 2) all third-graders can read at grade level, 3) all racial and economic achievement gaps between students are closed, 4) all students are ready for career and college, 5) all students graduate from high school (Minnesota's World's Best Workforce, 2013). Some changes in legislation, funding, and programs have arisen over the years to target these goals in respect to American Indian students, but with little to show for it. This student group has not experienced progress seen in other states or other minority groups, despite recent reforms. The restraints in personnel and resources within this department creates limitations their ability to do original research. As such, additional support in research, best practices, and innovative new ways was prioritized in this research.

American Indian Schooling Options

Nationally, there are currently six school types serving Native American children: 1) public schools in native communities, 2) Bureau of Indian Education funded schools, 3) tribally controlled schools, 4) Bureau of Indian Education operated schools, 5) Native Charter schools, 6) Native Language Immersion Schools. Each school choice aims to create education programs to fulfill the unique needs of American Indian students, though the student experience can differ drastically among the options (National Indian Education Association, 2017). Within these options, about 93% of Native children are enrolled in public schools, making it primarily the responsibility of Federal and State governments to provide for these children (National Indian Education Association, n.d.). Additional school choice available to minority demographics, such as Charter Schools and Magnet Schools are not heavily utilized by American Indian students (Government Accountability Office, 2019). This leaves the impetus on the public school system to support the vast majority of Native American students across the country. The full breakdown of American Indian student enrollment nationally in School Year 2015-2016 can be seen in Figure 5 (Government Accountability Office, 2019).

Figure 5.



Within Minnesota, American Indian students have the choice to attend traditional public schools, BIE schools, or American Indian-controlled tribal contract or grant schools on a reservation. Minnesota currently has 4 Tribally controlled schools, and no BIE operated schools (Bureau of Indian Education, n.d.). Minnesota's primary school choices and breakdowns can be seen in Figure 6. About 4.2% of American Indian students attended one of the four tribal contact schools, funded by the Bureau of Indian Education (State of Indian Education in Minnesota, 2015). As of January 2021, 15,584 Native American students are enrolled in Minnesota Public schools (PreK-12) (Minnesota Department of Education Data Center, 2021), representing a large majority of American Indian students. Additionally, one-third of Minnesota's American Indian students that attend public school, do so in an urban setting (in the metro area) while 2/3 attend in more rural areas in greater Minnesota (State of Indian Education in Minnesota, 2015). As such, Minnesota has one of the most urban-based American Indian student population groups. When looking at the distribution of American Indian students within Minnesota Public Schools, the distribution of the top 10 highest concentration of American Indian students in the 2018-2019 is relatively spread out. The top 10 schools are and American Indian student makeup are as follows (MN House Research, 2020):

1. Pine Point: 100% American Indian
2. Nett Lake: 100% American Indian
3. Red Lake: 99.7% American Indian
4. Cass Lake-Bena: 81.8% American Indian
5. Waubun-Ogema-White Earth: 61.7% American Indian
6. Mahnomen: 61.1% American Indian
7. Browns Valley: 56.6% American Indian
8. Kelliher: 48.8% American Indian
9. Onamia: 45.8% American Indian
10. Northland Community Schools: 38.3% American Indian

When looking at magnitude of American Indian students served, there are also a few schools that serve a relatively large portion of American Indian students. The St. Paul school district serves 2.6% of Minnesota's American Indian student population, and they house the American Indian Magnet school that serves grades K-8. The Minneapolis school district serves 6.8% of Minnesota's American Indian students and houses the Anishinabe Academy, an American Indian-centered school site. This Academy works with two alternative programs run by community agencies to serve students K-12 among all programs. The Duluth school district serves 2.1% of Minnesota's American Indian students, and they provide language immersion for students K-4. Uniquely, the White Earth Reservation Tribal Council controls Pine Point public school, serving students K-8, which operates comparably to other public school districts, but specifically caters to American Indian students, history, and culture (MN House Research, 2020).

Figure 6.

Percent American Indian Students by Type of School

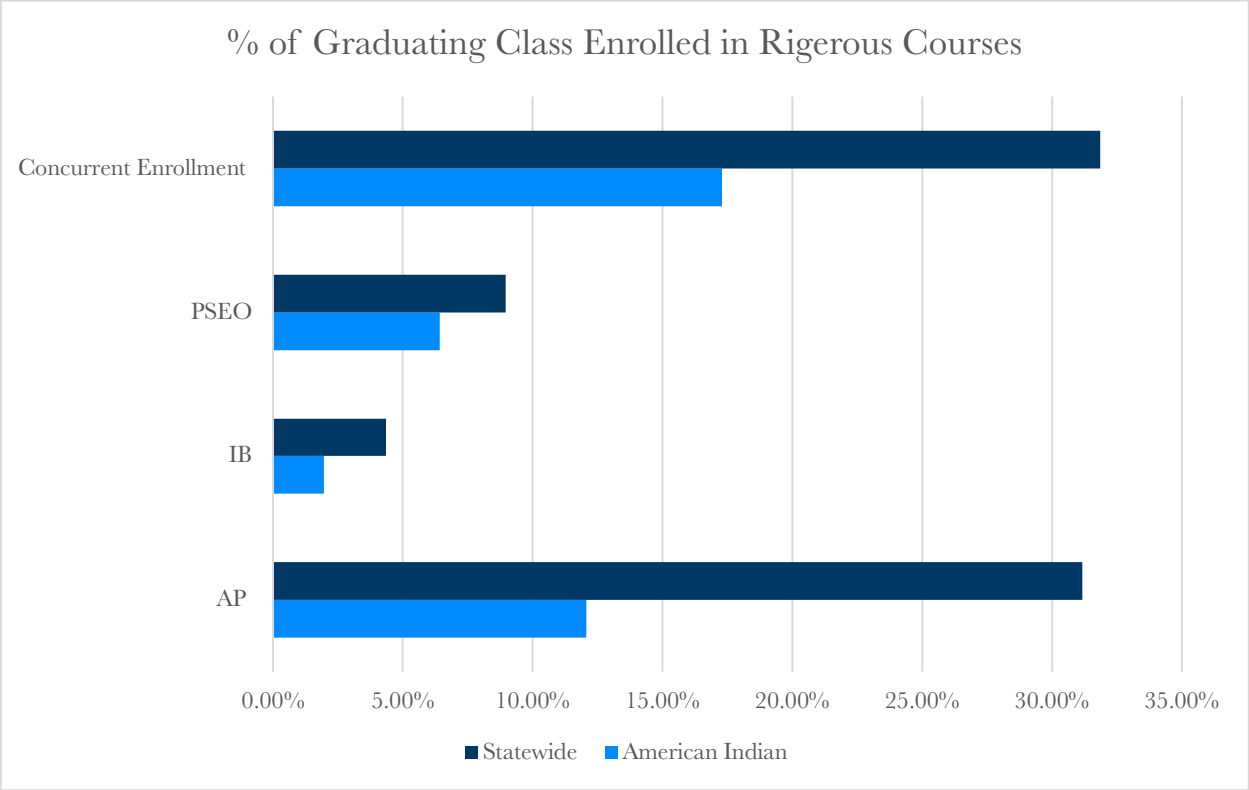
	American Indian Students	All Students	Percent American Indian Students	Percent of Total American Indian Students
District	13,999	829,822	2%	89%
Charter	840	59,482	1%	5%
Tribal Contract	817	817	100%	5%
State Total	**15,656**	**890,121**	**2%**	**100%**

The Achievement Gap

American Indian students see drastically different academic outcomes, as measured by a wide variety of academic indicators. The 2019 four-year graduation rate for American Indians in Minnesota was 32 percentage points lower than all students on average, which is indicative of a broader achievement gap in Minnesota public schools, specifically for these students (Minnesota Department of Education, 2020). In statewide high school accountability tests that demonstrate math, reading, and science proficiency, the percent of American Indian students that are considered proficient are 26, 24, and 25 percentage points respectively below the state average (Minnesota SLEDS, n.d.). In comparing an additional statewide standardized benchmark, the North Star Achievement rates from grades 3-11 in reading and math reflect American Indian students scoring significantly lower than the state average. In reading and math, American Indian students average 34% and 25.9% respectively, while the state averages measured 58.3% and 53.9% in 2019 (Minnesota Department of Education, 2019)

Additional indicators that reflect success in high school and potential matriculation to higher education also display inequities. Only 18% of American Indian students that took the ACT in 2015 met three or more benchmarks (ACT Inc., 2015). Beyond exams and test scores, grade 9 guidance counselors reported that their primary goal was postsecondary planning and preparation with only 29% of American Indian students (Ross et al, 2012). Another indicator that can lower barriers to higher education is enrollment in rigorous course loads, including PSEO, AP, IB, and Concurrent Enrollment. American Indian participate in these programs at much lower rates than the national average as well, as can be seen in Figure 7, displaying 2019 graduating class rigorous course enrollment. These academic statistics are symptomatic of a broader problem of American Indian student support in Minnesota public schools (Minnesota SLEDS).

Figure 7.



American Indian students also experience school holistically in a drastically different ways than their white peers. American Indian students are subject to disciplinary actions at much higher rates than other demographics. While American Indian students only comprise about 1.7% of students in Minnesota public schools, they account for about 5.5% of disciplinary actions across the states. Additionally, at least 10.3% of American Indian students missed at least one day of school because of these disciplinary actions (Minnesota Department of Education, 2019). More generally, when measuring if students attended at least 90% of school days, Minnesota had about 85% of students with consistent attendance, while American Indian students only averaged about 57.6% obtaining consistent attendance (Minnesota Department of Education, 2019). Among students experiencing homelessness in Minnesota Public Schools, American Indian students are also disproportionately over-represented, by a staggering factor of 6.1 (Minnesota Department of Education, 2019). This has major implications on chronic absenteeism, academic proficiency, and graduation rates. These non-academic outcomes play a large part in how American Indian students experience school, and further exacerbate the academic disparities previously discussed.

This achievement gap doesn't stop in the K-12 public school system, rather it carries negative repercussions for American Indian students in their endeavors after school. Even among Native American students that earn a high school degree, many experience additional barriers and disparities both in entering and experiencing higher education or the workforce. This is highlighted very quickly when looking at higher education going rates among American Indian students. In 2013-2018, the percent of American Indian high school graduates that don't subsequently enroll in College has risen from 30% to 53% (Minnesota SLEDS). With college enrollment levels already low, college completion is another area of concern. Of the 2008-2010 Minnesota public high school graduates, 77% of American Indian students did not earn a college

certificate or degree within six years of graduation (Feygin et al. 2019). Additional inequities exist in the level of education obtained. Additionally, career placement and success has proved to be difficult for American Indian graduates. American Indian graduates reported the lowest annual earnings of all racial and ethnic demographics, reporting a median of $16,370, compared to white students with the highest median earnings of $23,403 (Feygin et al., 2019). The scope of the problem is undoubtedly large, with large disparate gaps in outcomes for American Indian students.

Jurisdiction

While it is evident these gaps have existed and persisted throughout history, the regulatory environment in which education exists provides additional obstacles in effectively targeting American Indian student success. Overarching federal policies and reporting requirements as outlined in the Every Student Succeeds Act can remove some flexibility in accommodating the needs of states with high populations of American Indians. The domain in which American Indian Education policies fall under become further complicated by the status of Indian Tribes as sovereign nations (Ricker et al., 2020). Organizations such as the National Caucus of Native American State Legislators and the National Indian Education Association (NIEA) provide avenues for advocacy and collaboration to best support American Indian students.

This issue of American Indian student success is often plagued by the decentralized nature of public education in the United States. While federal policies and funding can provide infrastructure for states to support American Indian students, the impetus is on the state and local education agencies to implement programming. The federal government has provided some student support, though the burden falls primarily on state and local education agencies, as well as the Native Reservations to fill gaps in federal policy and support this underserved population.

Federal Legislation and Programming

When looking at the federal landscape within which states function to educate American Indian students, the primary guiding document is the 1972 Indian Education Act. With this, came the establishment of the U.S. Office of Indian Education, the National Advisory Council on Indian Education, and authorized a formula and grant program to fund Indian education (Overview of Indian Education Laws and Policies, 2015). The Bureau of Indian Education (BIE) was established in 2006, within the Department of the Interior. The BIE is responsible for providing educational opportunities from early education through life while considering the needs for cultural and economic well-being. The BIE school system oversees 183 elementary and secondary schools, and dormitories in 23 states. These schools are federally funded through a weighted funding formula, allocated by the U.S. Department of Education. Currently, 130 of these 183 BIE-funded schools are tribally controlled, with the remaining schools operated directly by BIE. Minnesota has four Tribal Contract schools, funded by BIE on the Leech Lake, White Earth, Fond du Lac, and Mille Lacs Reservations. These four schools house 817 students as of the 2018-2019 school year (MN House Research, 2020).

The Elementary and Secondary Education Act (ESEA) is the other primary federal legislation impacting American Indian students. It's 2015 reauthorization, the Every Student Succeeds Act (ESSA), requires state reports and accountability to the federal government. Specifically, Title I is the largest source of federal education funding for many demographics, including American Indian students. Additional components of ESSA contain provisions relevant

to American Indian students. First, it is important to note the current federal Indian Education programs and funding. Title VII serves as a Federal Formula Grant under the United States Department of Education, Office of Indian Education. Students qualify if they are an enrolled member of a federally recognized tribe, or a first or second generation descendent. To receive these benefits, applicants must fill out an ED 506 form for each child. Additionally, when granted they must require a parent committee, composed of and selected by parent and guardians of American Indian children in the school district (Overview of Indian Education Laws and Policies, 2015). Additionally, at the federal level, the Johnson O'Malley (JOM) Act was enacted in 1934 to serve Indian students in public schools, rather than providing separate BIA schools. Its primary purpose is to motivate the subsidizing of public education for Indian students in the United States. However, appropriations for JOM programs have been reduced drastically from around $400 to $64 per student (Overview of Indian Education Laws and Policies, 2015). Federally funded Impact Aid is intended to help local school districts that lost property tax revenue because of tax-exempt property. To earn this, they must establish a board-approved American Indian Policies and Procedures that meet statutory requirement and develop and keep strict records of compliance (Overview of Indian Education Laws and Policies, 2015). While these serve as the primary federal funding sources, other grants, professional development, and initiatives have fluctuated over the years with varying degrees of success.

State Legislation and Programming

American Indian students did not enter the public school system until 1936 when an $80,000 contract was established between the State Board of Education and the Bureau of Indian Affairs for American Indian students in northern Minnesota to participate in the public school system. Throughout the following few decades, funding, grands, and scholarships that supported American Indian students began to grow as well (State of Indian Education in Minnesota, 2015). Specifically, Minnesota funded grand programs in the 1970s, including the Postsecondary Preparation Program, and the American Indian Language and Culture Program. However, it was not until 1982, when a Policy Statement on Indian Education was released from the State Board of Education, that American Indians became prioritized as members of the public school system. In the following years, landmark plans and policies were adopted to outline the education expectations that recognizes the unique needs of American Indian students. Along with program development, the State committed to Government-to-Government Tribal consultations through the 2010s (State of Indian Education in Minnesota, 2015).

Statewide, the Indian Education Act of 1988 recognizes the unique educational and culturally related academic needs of American Indian people. This serves as the Minnesota precedent to establish programming to benefit these students (State of Indian Education in Minnesota, 2015). This act encourages schools and districts to develop programs that include: instruction in American Indian language, literature, history and culture; staff support; research projects on effective communication; personal and vocational counseling; modified curriculum and procedures; and cooperative agreements with alternative schools that have precedent with American Indian culture in their curricula. Additionally, it makes provisions for hiring and staffing additional American Indian teachers. Beyond academics, this Act also requires the education commissioner to consult the Tribal Nations Education Committee on all issues related to American Indian Education. Additionally, the commissioner must appoint an Indian education director that specifically prioritizes these issues and develops reports, strategic plans, and frameworks for American Indian student success (MN House Research, 2020).

Within these legislative progressions, many programs and funding streams have been enacted and currently are operating for American Indian students. One of the largest programs, running from 2000-2015 was the Success for the Future Grant, which was a highly competitive grant awarding a maximum of $69,500 annually. However, barriers and technicalities of the programs motivated a change in program structure after the 2015 legislative session. Starting FY 2016, that program was replaced with an aid program called New Indian Education Revenue. Under this, any district, charter, or BIE that enrolls at least 20 American Indian students will receive at least $20,000, and an additional $358 for every American Indian student over the initial 20 students. This expanded funding and the number of schools that are eligible for funding (New American Indian Education Revenue, 2015).

Additional funding for students falls under scholarships, grants, and school aid. American Indian scholarships provide need-based scholarships to Minnesota residents that are at least 1/4 American Indian ancestry to use at accredited Minnesota postsecondary institutions. Indian Teacher Preparation Grants assist American Indians that want to enter the teacher workforce by partnering with local school districts, colleges, and universities to assist them in earning the necessary education and certifications. Additional funding from a state-wide lens provides tribal contract schools additional funding on a per-pupil basis, intended to make up the difference between federal funding, and state funding provided to other schools (MN House Research, 2020). More thorough appropriations for these and additional programs can be seen in Figure 8.

Figure 8.

Indian Education Programs
Fiscal Years 2020 and 2021 Appropriations

Program	Statute	Amount	
		2020	2021
American Indian Education Aid	Minn. Stat. § 124D.81	$9,515,000	$9,673,000
Tribal Contract Schools	Minn. Stat. § 124D.83	$3,275,000	$3,763,000
Indian Scholarships	Minn. Stat. § 136A.126	$3,500,000	$3,500,000
Indian Teacher Preparation Grants	Minn. Stat. § 122A.63	$460,000	$460,000
Tribal College Grants	Minn. Stat. § 136A.1769	$150,000	$150,000
Early Childhood Programs at Tribal Schools	Minn. Stat. § 124D.83, subd.4	$68,000	$68,000
Total		**$16,968,000**	**$17,614,000**

Programmatically, Minnesota has dedicated itself to working closely with Tribal nations through Tribal consultation policies. Per Governor Dayton's Executive Order 13-10, Cabinet agencies shall consult with Minnesota Tribal nations to identify priorities, consider input from consultation into decision-making process, designate a staff member to oversee implementation, and provide training for staff (2014). Additionally, Minnesota established the Tribal National Education Committee (TNEC) in 2009, to consult in all matters on education of Minnesota American Indian Communities. As a result of this, additional discussions, policies, and programs have been established to facilitate government-to-government tribal consultation on American Indian Education in Minnesota (Overview of Indian Education Laws and Polices, 2015).

National/State Comparisons

While the impact of federalism can be burdensome, it also provides the opportunity to use other states as case studies. States such as Oklahoma, Arizona, and South Dakota, with high proportions of American Indian students can serve as comparisons and resources for interventions that might prove successful. American Indians can take many different paths through education, and different states support their local tribes in many different ways. By drawing comparisons and evaluating similarities and differences, the Minnesota Department of Education can expand potential solutions to better support American Indian students.

Minnesota ranked 9th in the country for highest number of Native students enrolled in public schools in 2013 (The Education Trust, 2013), as seen in Figure 9. While it is clear that nationwide trends are consistent in showing large achievement gaps, some states and local school districts have had some success in improving American Indian student outcomes. When looking at NAEP performance for American Indian's in fourth-grade reading, both Oregon and Oklahoma have stood out with around a 25% passing rate, compared to Minnesota's 13% (The Education Trust, 2013). In just 2011, Minnesota was ranked last in on-time graduation rates across the country (Long, 2015). While each state features its own legislation, priorities, and funding structure, investigating other states with similar demographics and examining outcomes can be a strong first step in improving Minnesota in the national rankings.

Figure 9.

State	Number of Native Students
Oklahoma	116,597
Arizona	55,312
California	43,546
Bureau of Indian Education	41,962
New Mexico	34,530
Alaska	30,433
Texas	23,607
North Carolina	22,199
Washington	17,570
Minnesota	16,296

IMPACT

This equity gap manifests itself in many ways, both related to education as previously discussed, but also through externalities. Long term repercussions as a result of this achievement gap accumulates to both the individuals and society as a whole. Should status quo continue, consequences will accumulate to external factors, including but not limited to: government, the Indian Sovereign Nations, and the individuals themselves, and beyond. Many studies have investigated the negative repercussions of dropping out of high school. While nationally, the dropout rate for American Indian students is estimated to be between 30%-50% (Backes, 1993), it's likely Minnesota's estimate is closer to 50% graduation rate (Minnesota Department of Education, 2020). This large dropout rate creates a significant impact in the long term.

Consequences

The opportunity costs associated with dropping out of high school, and subsequent low college and career readiness manifest themselves in the missed academic and work opportunities from graduating from high school, obtaining a college degree, and/or workforce involvement. When looking at opportunity costs for low high school graduation rates, it is estimated that lifetime earnings of dropouts are $260,000 less than those with diplomas (Graduation Alliance, n.d.). The Graduation Alliance further estimates that high school dropouts average an annual income of $20,241, which is corroborated by Minnesota specifically. Even of those that graduate high school, median earnings of American Indian students six years after high school graduation averages only $16,370 annually, compared to an all-graduate median of $22,717 (Feygin et al., 2019).

Another subsequent outcome of low American Indian student achievement is the seen in costs accrued to the individual dropout in unemployment trends. Nationally, the unemployment rate for dropouts is about 4% higher than the average (Graduation Alliance, n.d.). Recently, it's been shown that only about 40% of adults who dropped out of high school are employed, and the need for high school diplomas for employment will only continue to grow (Alliance for Excellent Education, 2003c). These correlations are highlighted in the American Indian Unemployment rate of 17.4% (Bodin, 2016). Assuming the labor force for American Indians in Minnesota is 24,118 (Bodin, 2016), this unemployment rate suggests approximately 4,200 individuals are unemployed. Further, American Indian labor force participation in Minnesota is the lowest of all demographic groups, at a mere 57% (Career Force, n.d.). While minimal studies have evaluated the true cost of unemployment, scholars have estimated the cost to workers of unemployment is substantial, and could be as high as $100,000 (Masur & Posner, 2012).

Beyond impacts felt strictly because of low college and workforce involvement, an additional externality could be unemployment benefits. Even all unemployed Minnesota American Indian qualified for unemployment benefits, Minnesota only allows for weekly benefits of about 50% of your average previous wage, up to $740 (Minnesota Unemployment Insurance, n.d.). Using average incomes for American Indians, and assuming American Indians are eligible for Unemployment Benefits, they would still be missing out on at least $10,000 of income annually.

Additional externalities are felt widely, though some are much harder to monetize. One of the largest unintended consequences of American Indian students not graduating high school and subsequently entering higher education or the workforce, is the lack of representation in labor markets later in life. Because low college and career readiness in high school results in

lower college and workforce participation, American Indian perspectives and involvement is lost in many industries. Diversity and representation is inherently good and positively impacts the workplace, thus this missed opportunity has negative impacts (O'leary & Weathington, 2006). Additional arguments for increased diversity includes assertions that diversity is connected to higher productivity (Kochan et al., 2003). In this case, there is lost value for society and companies within Minnesota by this demographic not participating in the labor market.

Dropping out of high school often is associated with increased costs from the social safety net. One example of this is the relationship between crime and high school drop-outs. It is estimated that about 73% of America's state prison inmates are high school dropouts (Harlow, 2003). Additionally, high school dropouts are 3.5 times more likely to be arrested in their lifetime than those who have a high school degree (Alliance for Excellent Education, 2003a). On a national level, increasing the high school graduation rate by about 1% is estimated to save approximately $1.4 billion in incarceration costs (Alliance for Excellent Education, 2003a). On an individual level, it is estimated that the average high school dropout will cost taxpayers over $292,000 due to lower tax revenues, in-kind transfer costs, and other imposed incarceration costs, when compared to an average high school graduate (Sum et al., 2009). Native Americans are also disproportionately overrepresented in prisons and jails, accounting for 7.6%, when they only account for 1.1% of the Minnesota population (Prison Policy Initiative, 2004). Additional social safety net costs could also be accrued through the high poverty rate of 31.4% for Minnesota American Indians, with a subsequent higher dependency on welfare (Culture Care Connection, n.d.).

High school dropout rates are also highly correlated with the state of individual health outcomes. Both male and females with low academic achievement are twice as likely to become parents by their senior year of high school (Alliance for Excellent Education, 2003b). Chronic health conditions such as diabetes and heart disease are also associated with dropping out of high school, (Vaughn et al., 2014). While explicit costs to society are difficult to estimate here, high school dropouts are more likely to be reliant on social programs, adding to public spending (Graduation Alliance, n.d.). The manifestations of this can already be seen in Minnesota statistics. For example, the average life expectancy for Minnesotan American Indians is a mere 61.5 years, the lowest of all racial and ethnic minorities (Ferris, 2012). Additional major health disparities are present for American Indian communities including a 500+% increase in alcoholism, suicides rates that are double the national average, and increased diagnosis of Diabetes and Tuberculosis (Center for Native American Youth, 2012).

Generally, impacts of disparate education is felt widely and in the long term. Mitigating these disparities early on, while in the public school system could provide numerous benefits to individuals and society.

LITERATURE REVIEW

Causes of Dropouts

In order to mitigate American Indian student dropout and promote academic success, identification of root causes and targeted intervention is vital. While there are many factors that are associated with higher student dropout rates, those that are particularly important for American Indian students are: large schools, uncaring teachers, passive teaching methods, irrelevant curriculum, inappropriate testing, tracked classes, and parent involvement (Reyhner, 1992). Additional studies have identified factors such as teacher student relationships, content of schooling, and lack of parental support (Swisher & Hoisch, 1992). A U.S. Department of Education study identified the top reasons why American Indian students drop out of school: (1) uncaring teachers, (2) curriculum designed for mainstream America, and (3) tracking into low achieving classes and groups (U.S. Department of Education, 1991). A study of Navajo students found the highest student reported reason for dropping out was that they were bored with school (Platero et al., 1986). Additionally, parent educational expectations are far lower for American Indian students than any other minority demographic, indicating a lack of cultural and familial support in academics (Kim et al., 2013). It appears that many factors contribute to the high rate of American Indian dropouts, (Reyhner, 1992).

There have been few academically rigorous studies to measure the impact of interventions on American Indian student outcomes. To further complicate things, most interventions have been implemented on a very small, local level, making generalizability difficult. Additionally, few wide sweeping reforms have been implemented and evaluated recently, so many studies don't reflect current trends, limitations, and best practices. However, there are some lessons to be learned from the literature of previous attempts at closing the achievement gap for American Indian students. Additionally, looking at other minority populations could provide some insight to promising interventions, with the consideration made that often these populations are inherently different than American Indian students.

Cultural and Language Programs

School curriculums that promote the language and culture of their native community has proven to be significant in improving academic outcomes, time and time again. (Demmert, 2001). In a highly rigorous study, cultural programming and training improved educational outcomes for American Indian youth. This programming resulted in higher quality teacher instruction, improved school climate, and significantly higher achievement, school presence and participation (Powers et al., 2003). Other successful programs promote supportive school communities, foster an inclusive school environment, and promote resiliency in school (Borman & Rachuba, 2000). Similar outcomes were found specifically in the Midwest, with promotion of enculturation that was positively related to school success (Whitebeck et al., 2001)

In a review of literature, presentations, and interviews, Native language integration has proven to be of high importance in promoting cultural competency. Promoting Native culture and language encourages a positive sense of identity and attitudes about school to improve academic performance among native students (Demmert, 2001). Additionally, accounting for language barriers, by using instructional practices in both native and English languages resulted in increased sense of belonging, increased test scores, and improved proficiency in English (Smallwood et al., 2009).

Academic and Teaching Programs

Another way to intervene and benefit American Indian students is to promote traditional academic success in standardized testing and assessments. Models and programs have been enacted in many schools to specifically meet academic requirements, though less often is this strictly academic-based approach taken with American Indian students.

One common model to address education needs of diverse populations is Response to Intervention. This model recognizes that students experience different needs, and creates a formal referral program to meet these unique needs. It allows for an adaptive approach to meet the cultural learning styles of minority students, and has anecdotally shown positive outcomes on annual yearly progress scores (Kashi, 2017). Researchers have also indicated the potential for RTI models to be implemented in a way that promotes equity. Should RTI be implemented with equity in mind, it can serve the interest of students that are otherwise marginalized (Equity Assistance Centers, 2008)

Mentoring has also recently gained support as a policy with the potential to improve student outcomes. It has found to be a successful program within American Indian communities, outside of the educational context (Weinberger, 2017), and within the public school districts more broadly (DeBolt & Morine-Dershimer, 1992). Outside of class programming has also proved to be successful. For example, researchers summer and afterschool camps targeted toward Native American students to cultivate culture, academics, leadership, and team building helped establish buy in and school retention (Price & Mencke, 2013).

Finally, evidence has shown that measures of academic success and standardized exams can be biased against minority students (Medina & Monty, 1990; Au, 2020). However, new assessments used in schools that are intentionally crafted, such as the DISCOVER assessment can more accurately place minority and under-represented groups in gifted programs for academic success (Sarouphim, 2002). This can effectively place American Indian students into high tracking classes, giving them an increased potential to succeed.

Holistic Programs

Holistic programs often combine the cultural and language component with the added academic challenges for a more comprehensive intervention for American Indian students in education. A 1999 evaluation of exemplary programs in Indian Education provides a case study of the top 5% of education programs in student outcomes. A review of these programs resulted in 11 commonalities of the most successful American Indian education improvement programs. These are: 1. Acknowledgement of the problem, 2. Set priorities for problems, 3. Vision, 4. Planning, 5. Commitment, 6. Restructuring and retaining, 7. Goal setting, 8. Experimentation, testing and evaluation, 9. Outreach, 10. Expertise, 11. Administrative support (Chavers, 1999).

While this study does not establish any sort of causality, and it is selectively evaluating programs, it provides a good starting point when looking at successful interventions to improve academic outcomes. Specifically, a case study in Cass Lake, Minnesota supports the conclusion found in other literature that successful projects require a cooperative effort for a comprehensive program (Chavers, 1999).

Inclusion of Sovereign Nations in Education Decisions

Proposals recommending shifting some decision making power and collaboration with Native Nations are plentiful and often led by American Indian leaders and groups. There is little

to no rigorous academic research on the effectiveness of such policy proposals due to the lack of implementation thus far. However, their buy-in and experience as American Indian leaders creating these policies gives them credibility to be making recommendations in their own interest.

A study in Washington found that open communication and research of best practices was effective in finding positive tribal/school cooperation (CHiXapkaid et al., 2008). The Native American Rights Fund performed an evaluation of Indian Education laws for every state, identifying the types of laws each state possesses. Ultimately, their recommendation is to shift governance directly to tribal nations to shape their children's future and promote Indian education success. (McCoy, 2005). Additionally, a Proposal from Indian Country to the White House called for similar policy change, encouraging and assisting tribes to assume more control of education programs and governance of Indian Education. This policy proposal calls for a more substantive government-to-government relationship between the U.S. and Indian nations, as well as promoting Indian languages and cultures as a component of academic success (National Congress of American Indians, 1997).

Using this data as a starting point, alternatives were developed to mitigate American Indian high school dropout. While some follow specifically from previous attempts, others are drawn from promising up and coming reforms, and few are an attempt to creatively rethink the traditional solutions, in an attempt to try new reforms.

Preliminary Development of Alternatives

While the Minnesota Department of Education (MDE) is tasked with preparing all students for success in higher education or the workforce, they have not implemented education policies adequately to help American Indian students succeed at a rate comparable to other students. Limited resources and previous attempts at implementing education reforms have disproportionately benefitted white and majority students, furthering the achievement gap. Thus, in considering alternatives to remedy this problem, MDE must consider how to ensure education reforms and policies are implemented with equity in mind, aimed at closing the achievement gap.

Given the large variety in sources of dropout, and the wide-sweeping jurisdiction MDE has in education reform, an exhaustive list of alternatives and implementation strategies should be considered in preliminary stages. While potential alternatives can be implemented at different levels and operationalized differently, ultimately outcomes should be measured in improvement in academic success for American Indian students.

First, alternatives can be differentiated between those that are implemented at the institutional level within government, and those that are implemented at a school level and focused locally. Within these denominations, we can further parse out types of programming within each domain, and finally result in potential alternatives that are both mutually exclusive and collectively exhaustive from which the most viable options can then be further developed.

Some considered alternatives include but are not limited to:

School-level response to intervention

Response to intervention programming acknowledges the unique needs of diverse populations and creates a formal referral program to best serve students. This requires tiered intervention strategies with formal evaluation that provides unique instruction to get students back on grade-level for any given subject. RTI emphasizes the need for early identification, intervention, monitoring, behavioral assessments, empirically supported procedures and protocols, and a team based approach

Academic Tutoring
Tutoring and other similarly targeted academic programs would aim to increase instruction time for American Indian students. Small tutoring groups or one-on-one tutoring outside of normal classroom time would not inhibit learning by replacing other important courses and experiences, rather would provide focused intervention when a need is shown through low test scores, or as indicated by an IEP.

Teacher Trainings
Culturally responsive instruction asserts cultural competence into the classroom through developing personal and interpersonal awareness. The goal of this alternative is to reframe the ethnocentric view many teachers are trained in and to immerse teachers into the history and culture of American Indian students that is so commonly left out. Targeting teacher impacts on American Indian student achievement could intervene with teachers already practicing, or at the entry step for new teachers. MDE could implement teacher training workshops and programming intended to eliminate cultural bias and promote inclusivity in the classroom.

Change teacher certification process
This alternative aims to intervene at the entry level for new teachers, promoting cultural competence and a diverse workforce. By providing more areas of entry for American Indian community members to join the teacher community, and educating non-American Indian teachers on cultural competence, there is potential for a more inclusive classroom culture.

After school programs
After school programs that provide American Indian students with additional resources have proven potential to improve student outcomes. Programming could mirror already-established after-school development programs. This could include time and resources for academic help, allocated meals or snacks, social events, and potential transportation after the program.

Mentoring programs
Mentor relationships, both formal and informal, are very common in American Indian communities, and have showed positive impacts on engagement in school. In order to connect American Indian students formally through mentorship programs, they could take the form of commonly used leadership programs that pair an upper-classman and a lower-classman. This mentorship could include both academic help, and a more informal mentor relationship with navigating social circumstances.

Language immersion programs
Language immersion programs allow spaces to integrate native languages into the education space. This alternative would provide Native and potentially non-Native students an opportunity to both learn and practice using native languages in the context of education, after school programs, and beyond. Often, this is implemented through state-wide funding for schools, local community centers, and other social spaces to create their own language programs.

Increased collaboration with local reserves
A key component in American Indian student success is the understanding of their culture and any potential barriers that might not exist for other demographics. To remedy this, increased

connection and collaboration with Reserve leaders could provide insight and guidance on implementation strategies that would make the most improvement. This could take a variety of forms, from increased participation on school-decision making committees, school boards, PTAs, etc. Additionally, it could also provide a way to cultivate a relationship for shared events and programs to bring American Indian culture and members into the schools for the community to experience together.

Changes in hiring process for teachers and staff
Systemic change to the hiring process of teachers could provide opportunities for American Indian representation in teachers and school staff. Current barriers involve an education background, licenses, and certifications for American Indians to enter the education work force. By providing exceptions and lowering these barriers specifically for American Indian members that may have had a less traditional school experience, but are qualified nonetheless to enter the classroom improves diversity and lowers the cultural barrier.

Changes in funding structures
Recommendations to changing the process for American Indian Aid and Racial Equity Aid have been proposed, yet implementing these funding changes have proven difficult. Often, the impetus is on the schools to correctly file and claim funding that might be there as well, serving as another barrier. Thus, changing the process and simplifying the procedures needed to receive funding will provide schools with higher American Indian populations could increase financial accessibility, and potentially result in more funding to implement school-wide changes.

Increased funding for college and career readiness
State-wide coordination of college and career readiness initiatives and programming available to American Indian students would alleviate the financial burden for American Indian students to prepare for this transition themselves. This could take the form of workshops, resources, waiving of standardized test fees, or other programming aimed at lowering the barrier to prepare for success beyond high school. Additionally, cooperating with local colleges and universities to establish a connection in to programs of interest for American Indian students would be beneficial.

Expand the Minnesota Office of American Indian Education
As it stands, the Minnesota Office of American Indian Education has decreased in funding and size, as measured by full-time employees, in recent years. With minimal American Indian staff representation in other offices, decision making impacting American Indian students is common without American Indian representation. By either increasing the size of MDE's Office of American Indian Education, and/or prioritizing hiring American Indian staff members throughout MDE's structure can help make informed decisions that benefit this population.

Create a more inclusive curriculum
Current state-wide curriculum still reflects an ethno-centric, primarily white view of history, culture, language, and other topics. A move to incorporate more information about the culture and history of American Indian populations in Minnesota and across the country, as well as increasing representation of American Indian authors and resources could provide more mutual understanding, and cultural competence within the classroom.

Improve reporting specifications and processes

As it stands, tracking, reporting, and correctly coding American Indian students is very difficult and a burden often put on students to ensure they are identified correctly. Systemically underreporting of this population has large impacts in funding and when looking at student outcomes. Developing a system to more accurately and efficiently allow students to identify themselves and track them through their tenure in Minnesota Public schools would help truly identify where the largest problems still lie, and if any improvements are being made over the years. In this case, future changes could be attributed to actual change, not trivial changes in reporting.

Changing academic testing standards for increased representation

As it stands, the standardized academic assessments determine proficiency in a very traditional sense. Recent scrutiny has highlighted these scores, that are highly determinate of success, graduation, and college enrollment, may disproportionately impact minority students. Reviewing these exams and standards by which success is defined state-wide could provide a space for Minnesota to incorporate a more inclusive, quality education, that allows students to showcase their knowledge in a more inclusive manner.

Values Discussion

The values asserted by my client will help inform the narrowing of alternatives to focus on. MDE prioritizes equity and college and career readiness, as emphasized in Minnesota's World's Best Workforce legislation (2013). This statute requires school districts to meet long-term, comprehensive strategic plans to improve student learning (Minnesota's World's Best Workforce, 2013). Governor Tim Walz reiterated these values in a 2020 report following a roundtable discussion on education and equity in Minnesota. Here, the roundtable participants developed priorities to transform Minnesota education, including the need to "redesign and rebuild systems that are anti-racist and culturally affirming with policy and practice decisions centering on the development of students of color and American Indian students to achieve racially equitable outcomes" (Governor's Education Roundtable, 2020). The action steps derived from this priority ranged from discrete and tangible, to vague and sweeping. However, the full MDE Strategic Plan released in 2021 again addressed the gap in equity currently with additional proposals. They reaffirmed equity for students and said "Every child, no matter their race or zip code, deserves a world-class education, with caring and qualified teachers, in a safe and nurturing environment. Public education is a fundamental right for all students with access and equity as the foundational principles" (Minnesota Department of Education, 2021). This was operationalized through quantitative goals for improving American Indian student outcomes, though less attention was paid to specific, concrete strategies to achieve equity for American Indian students. While this legislation aims to prepare its students for future success in higher education and the workforce, American Indian students are still among the most disadvantaged, and lowest achieving demographics. While these values have been stated and reaffirmed in the past few years, ultimately, their effectiveness remains minimal, with an achievement gap still far too pervasive.

Thus, when looking at the variety of alternatives previously proposed, as well as those asserted by Governor Walz and MDE, there are many options to pursue, and further narrowing is required. As such, criteria were developed to determine the three most viable, and subsequently evaluate the final three alternatives against. A discussion of the criteria, developed from the stated values of MDE, follows.

CRITERIA

1. Cost-Effectiveness

First, I will consider the costs associated with each proposed alternative. This will include only the costs accumulated to the Minnesota Department of Education as a result of implementation. All alternatives will project costs as far out as data allows, with a subsequent net present value estimated.

While effectiveness can be quantified in many different ways, it will be operationalized through the estimated financial benefit of increasing American Indian graduation rates. This is estimated by calculating financial benefits to the individual and society as a result of receiving a high school degree. This was be calculated as the average estimated benefit per increased student that graduates. The added benefit is estimated at $34,318.04 per student. Discussion of the process can be read in Appendix A, and calculations in Appendix B.

Because it is unlikely each alternative will have literature with confident projections of increase in graduation rates, I use the costs associated with the outcome, and estimate the increase needed to cover these costs. Ultimately, I attempt to project the increase in graduation rates needed for the alternative to be net-neutral.

2. Equity

Next, I evaluate the equity and distributional factor of each alternative. To capture this, I measure the distributional factor of the program through the state of the achievement gap. This will be quantified by monitoring the change in the difference of graduation rates at baseline for each alternative for American Indian students and their majority counterparts. This data is derived from estimations and projections created by the Western Interstate Commission for Higher Education through their project "Knocking at the College Door". A discussion of the data and quantification of this can be found in Appendix C.

This will be quantified by estimated plausible comparisons in graduation rate changes. A decrease in the projected difference in change of graduation rates will be classified as follows:

0-1% decrease: LOW
2-3% decrease: MEDIUM
4%+ decrease: HIGH

3. Political Sustainability

As a governmental entity, MDE is inherently impacted by the political climate and regulations. Changes in the political and economic landscape inevitably impacts the department structure, funding, and operations. As a result, each alternative will be evaluated based on its ability to endure through changes in power. This will be evaluated through how periodically the alternative is up for review or renewal in years. Alternatives will score higher, the less often it is up for review and potential revocation of funding, because we are working under the assumption that if funding or support for an alternative is not renewed, it likely will not be redirected to another American Indian education program. Thus, a higher number of years will represent more political sustainability. This will be classified as follows:

1 year: LOW
2-5 years: MEDIUM
6+ years: HIGH

4. Implementation Feasibility

Given the decentralized nature of education, implementation is a key consideration of alternatives. There can be a large variety in the execution and results of programming, based on the implementation in each school or locality. It is likely alternatives targeting the institutional level where MDE has more direct control and oversight will be streamlined, while alternatives delegated to localities will provide flexibility for schools to implement in ways that will be most effective given their circumstances. Thus, implementation feasibility will consider two factors.

First, it will consider the efficiency of establishing an alternative at the institutional level within MDE. Alternatives will score high here if they are well-researched, with clear guidelines on effective ways for implementation. Additional considerations will be made at this level if the institution has preexisting infrastructure and staff with experience that has the capacity to implement the new alternative.

The second consideration will be made at the local level of implementation. Here, the alternative should lend itself to having structured guidelines that promote relatively uniform implementation and potential for institutional evaluation. However, within these guidelines, the alternative should lend itself to some variability and flexibility for districts and schools to implement the alternative in ways that best suit their community. Informal evaluations of each of these components of implementation will result in a score of HIGH, MEDIUM, or LOW

ALTERNATIVE 1: CHANGE TEACHER CERTIFICATION

Figure 10.

	Cost	Effectiveness	Equity	Political Sustainability	Implementation Feasibility
Alternative 1: Change Teacher Certifications	$0	1-2%	Low	High	Medium

Description:

The Professional Educator Licensing and Standards Board (PELSB) sets and maintains standards for teacher preparation, licensure, and ethics. In July 2019, they set fourth four new goals specifically related to equitable access and prioritizing a diverse and effective teacher workforce (Minnesota Department of Education, n.d.). While they set forth four specific goals, the one most pertinent goal to this alternative is the revision process for the Standards for Effective Practice for Teachers. The PELSB's current work includes partnering with the Committee to Increase Teachers of Color and Indigenous Teachers to review and revise their standards around culturally responsive pedagogy and cultural competency.

The certification can be reformed to promote diversity and potentially increase TOC both in content and in structure. In this review and revision, MDE should prioritize a test that has less cultural bias and more relevance to teaching practices in a diverse community. Additionally, content of exams can be shifted against white cultural bias, by rewording questions that currently present as ethnocentric. Beyond the content of the exams, the process of exams could be altered to be more inclusive, as currently licensure exams often disproportionately exclude candidates of color (Carver-Thomas, 2018). Specifically, PELSB should expand accommodations in testing conditions to lower barriers for minority candidates, who would stand to benefit the most from this. These two changes, especially when paired with current reforms in developing alternative pathways for teachers to receive certification have the potential to lower barriers and promote a more diverse workforce with more American Indian teachers.

Cost-Effectiveness:

The anticipated cost for this alternative is $0. This merely requires a change in operations, rather than the creation of new systems or personnel. As such, current infrastructure and systems provide the space for this change in priorities and process to happen without additional costs. Effects of lowered barriers in receiving certification have not been studied in the context of student success. As such, estimations are required in calculating effectiveness.

Teachers of color and American Indian teachers (TOICAIT) make up only 4% of the 63,000 teachers in the workforce in Minnesota, and has stayed stagnant over the past two decades (Coalition to increase teachers of color, n.d.). I estimate American Indian teachers only make up about a quarter of this population. If this intervention can increase American Indian teachers by 10%, and assuming these teachers are placed in schools with a high (15%) American Indian student makeup, I estimate this could result in a 1.3% increase in graduation for American Indian students[1]. This would translate to a net benefit of around $438,461. These are

[1] This estimation comes from data on representative teachers in black communities (Gershenson et al., 2021)

rough estimates, as we are constrained by the literature and projections from similar alternatives. Calculations of these estimates can be seen in Appendix D.

Equity:

A more representative workforce has proven benefits to minority students. As diversity in teacher populations improves and cultural competencies continue to come to the forefront of education, it is likely all students will benefit from a diverse pool of teachers. While this intervention will provide the most benefit and target American Indian students, other students are likely to reap benefits of a diverse and culturally inclusive classroom. As such, it is likely the change in achievement gap will decrease only 0-1%, as a result of these holistic improvements. This results in a score of LOW for equity on this alternative.

Political Sustainability:

As it stands, there is no set schedule or norm for teaching competencies or standards of effective practices to be evaluated or changed. Changes appear on an ad-hoc basis as put forth by PELSB. Because there are no set time within which these would be repealed, I will assume any implemented changes will be stagnant for the long term. Thus, this alternative will score HIGH on political sustainability.

Implementation Feasibility:

The implementation feasibility of this alternative only needs to be considered at an institutional level. Changes within PELSB can be implemented within MDE. Existing infrastructure and norms to evaluate the diversity and inclusivity of these processes already exists. As such, implementing a focus on American Indian accessibility should require a marginal amount of additional work. However, this alternative would require more effort after the initial phase of implementation of changing the certification process. Subsequent changes administratively in executing the certification process, and in alerting prospective teachers of any changes would take significant work. As such, this alternative scores a MEDIUM on implementation feasibility.

ALTERNATIVE 2: EXPAND OFFICE OF AMERICAN INDIAN EDUCATION

Figure 11.

	Cost	Effectiveness	Equity	Political Sustainability	Implementation Feasibility
Alternative 2: Expand Office of American Indian Education	$1,075,325.06	3%	Medium	Low (1 year)	Medium

Description:

As it stands, the Office of American Indian Education staffs three full time positions, a statistic that has declined in recent years. Additionally, these employees are often tasked with many informal jobs and duties outside of their official description, spreading the support for students very thin. Increased support at the student level requires support at the institutional level. An increase in staffing of this office would provide additional capital to support students, schools, and work across offices in Minnesota to provide resources.

In expanding the office, MDE should hire a full time, permanent position, tasked with supporting American Indian students and specifically monitoring outcomes. This person should have familiarity with the political process, policy, specifically in the lens of American Indian students.

Cost effectiveness:

Anticipated costs of hiring a new position in this office are derived from the General Schedule as set forth by the U.S. Office of Management and Budget (OMB). Considerations are made for location in Minneapolis/St. Paul in grade and step pay. Assuming the hiring process would look to recruit someone with reasonable experience and/or a Master's degree, costs are projected using the GS-09, Step 1 allocation as a starting rate. Costs are then extrapolated for the next 21 years, until mid-career, as defined by Alliance for Excellent Education, when the benefits of increased graduation rates are set to accumulate. Using the OMB schedule and norms, each grade has 10 steps, with increasing salaries based on experience and general guidelines for time (Office of Management and Budget, 2021). For full calculations, see Appendix E.

After projecting anticipated salary over the next 21 years, and using an interest rate of 3%, the net present value of this position comes to $1,075,325.06. While there is no literature projecting what an increase in one position dedicated to these students could result in regarding graduation rates, given the net present value of the cost of not graduating, we can estimate how many students would need to transition from not graduating to graduating. Using the NPV cost of not graduating of $34,318.04, we can assume we need an increase of about 31 graduates for this alternative to result in a net positive. Given the 2019 graduation rate of 56% (958 students), that would require a 3% increase in graduates. This feels moderately plausible in the long-run. Given the high level of implementation at the institutional level, achieving a 3% rise in graduation levels per year would like require multiple cohorts to develop under the infrastructure change before results become salient. However, it is also plausible that with this change, long term graduation rates could increase beyond this 3% required to be net positive.

Equity:

In evaluating equity for this alternative, I compare the difference in change in graduation rates between white and American Indian students. I assume the increase in graduation rates will apply exclusively to the American Indian population because of the direct resources and assistance going to these students. General trends predict graduation rates for white students will decrease by 14% over the next 15 years, and American Indian graduation rates will decrease 7% over the same period.

Assuming the 3% increase in graduation rates predicted in the cost-effectiveness calculation to be net positive, American Indian graduation rates would decrease only 4% over the next 15 years. This would assume the change in graduation rates would result in a decrease of the graduation achievement gap by 3%. Thus, this receives a MEDIUM score on equity in closing the achievement gap when scoring this alternative on equity criteria.

Political Sustainability:

The budget supporting positions in MDE is renewed each fiscal year. However, while this may reflect a low score on paper, in practice, this alternative will likely score high on political sustainability. Because this is not a political appointee position, civil servants are subjected to potential budget changes less frequently, and more insulated from the volatility that accompanies changes in political appointments. It's relatively low dependency on political appointee funding and priorities will likely project this alternative a medium score in political sustainability. However, conservative estimates acknowledge this is a yearly renewal, and thus this alternative scores LOW on political sustainability.

Implementation Feasibility

Implementation of this alternative is unique in that it only needs to be considered at an institutional level and lacks implementation at the district or school level. Considerations in implementing this alternative would require securing funding, recruiting and hiring to fill the position, onboarding and training, and ultimately transitioning a new member into the team. This alternative is lengthy in timeline of the implementation process and requires the involvement of many stakeholders. However, its centralized nature eliminates complications in implementation at the local level. Additionally, implementation of this alternative is very front-loaded, with all work occurring in the time leading up to, and during the initial transition period of the new worker, and no future implementation considerations to be made. As such, this alternative will score MEDIUM on implementation feasibility.

ALTERNATIVE 3: INCLUSIVE CURRICULUM

Figure 12.

	Cost	Effectiveness	Equity	Political Sustainability	Implementation Feasibility
Alternative 3: Inclusive Curriculum	$0	1-2%	Medium	High 10 Years	High

Description:

Minnesota Standards of Learning serve as the basis for educating students K-12 in Minnesota schools. Standards are assessed in 6 content areas: arts, science, English language arts, social studies, mathematics, and physical education. Within each content area, further specifications for grades, areas, standards, benchmarks, lessons, and assessments are enumerated. Each content area and its specifications is up for review every 10 years. The current Standards and timeline is displayed in Figure 13.

Figure 13.

Current Review	Implementation Year	Next Review
2006-07	Mathematics 2010-11	2021-22
2016-17	Physical Education 2021-22	2022-23
2017-18	Arts 2021-22	2027-28
2018-19	Science 2023-24	2028-29
2019-20	English Language Arts 2024-25	2029-30
2020-21	Social Studies (to be determined)	2030-31

Source: (Minnesota Department of Education, n.d.)

An audit of current implementation of Standards relating to American Indian Tribes (Arts 2008, English Language Arts 2010, Science 2009, Social Studies 2011) concludes American Indian standards are included in four of the six content areas. (Minnesota Center for Social Studies Education, n.d.). This alternative would continue this review and incorporation of American Indian priorities in the standards of learning, but with an explicit priority diversity, and specifically incorporating American Indian culture and history. Increasing the number of standards in each subject related to and inclusive of American Indian traditions would increase cultural competency and understanding of all individuals in the classroom.

Cost Effectiveness:

Anticipated costs of this alternative would include those accrued to MDE in creating a more inclusive curriculum. The existing infrastructure, research, and systems in place serve all the needs to implement this alternative. Thus, the cost of this alternative is listed at $0. While additional costs may accrue to schools in the change of resource material, the net cost is likely minimal or null, given the curriculum would've included updated materials regardless of the content covered.

Because of the zero cost, any improvement in graduation rates for American Indian students would result in a net positive in cost effectiveness. While there is not academic research that predicts the impact of inclusive curriculum on graduation rates, previous literature reviewed has showed promise in this alternative on the outcome of graduation rates, as well as other indicators of academic success as well as sense of belonging for Native American students.

Even an increase in 1-2% in graduation rates would result in 10-19 additional students graduating. Using the benefit per additional student graduating estimate of $34,318.04, a one to two percent increase in graduates would result in long term benefits of $328,766-$657,533. Because of the low cost and potential benefits of this alternative, it scores very high in cost-effectiveness.

Equity:

Equity measurements for this alternative compare the outcomes for American Indian students and white students in the outcome of graduation rates. This alternative would impact all students in Minnesota public schools, as all districts and schools are subject to the same broad curriculum oversight set forth by MDE. As such, improvements in diversity of curriculum has shown positive effects for minority populations, and there has not been any research suggesting negative effects on white students. As such, I work on the assumption that any benefits from a curriculum change will accumulate specifically to American Indian students and minimally (if at all) impact white student achievement.

The projected effectiveness of this alternative suggests the potential to close the change in achievement gap by 1-2%, changing long term projected graduation rates from a decrease of 7% to 5-6%. As such, this alternative gets a score of MEDIUM in equity.

Political Sustainability:

This alternative works within the current structure and timeline set forth by MDE. Their calendar suggests a reevaluation and reinstation of curriculum standards every 10 years. This timeline provides a sense of permanency once American Indian priorities are integrated. As such, this alternative scores as HIGH on political sustainability.

Implementation Feasibility:

The implementation feasibility of this alternative is assessed both at the institutional and local level. Ultimately, after considering both levels, this alternative scores HIGH on implementation feasibility.

Institutionally, this alternative scores HIGH on implementation feasibility. A current norm and structure exists for this review and revise structure proposed here. Additional needs for this to be implemented at an institutional level would require an explicit statement of values, devoting incorporating American Indian history and culture into the curriculum more holistically. Given the current processes, relationships, and standards that exist, implementation is not a barrier to this alternative's effectiveness.

At the local level, this alternative also scores HIGH on implementation feasibility. Local schools and districts know are aware of and have previously experienced shifts in curriculum expectations. The implemented changes would be required, regardless if they were specifically focused on American Indian curriculum. This alternative also provides flexibility within schools, districts, and even classrooms on specific readings and materials that will serve to fulfill these standards. Additionally, schools are required to develop local standards for subjects that don't have state standards, allowing for further flexibility. One barrier to implementation might be the requirement of teacher trainings or education on these new topics to properly implement them in the classroom, though this is not considered an additional barrier to implementation feasibility, because at baseline, changes in curriculum would likely require this regardless.

OUTCOMES MATRIX

Figure 14.

	Cost	Effectiveness	Equity	Political Sustainability	Implementation Feasibility
Alternative 1: Change Teacher Certifications	$0	1-2%	Low	High	Medium
Alternative 2: Expand Office of American Indian Education	$1,075,325.06	3%	Medium	Low (1 year)	Medium
Alternative 3: Inclusive Curriculum	$0	1-2%	Medium	High 10 Years	High

RECOMMENDATION

In order to promote academic achievement for American Indian students in Minnesota Public schools, **Minnesota Department of Education should prioritize implementing alternative 3: Inclusive Curriculum.**

After parsing out each preliminary and evaluating final alternative against the four criteria, this alternative appears the most efficient and effective alternative, when measuring in terms the outcome of graduation rates. Alternative 3 incurs the least amount of cost and has the potential for benefits ranging from around $300,000 to $650,000. This alternative is actively closing the achievement gap and shows promise for long term, institutional change that can be implemented reasonably efficiently.

An audit by the National Congress of American Indians (NCAI) analyzed the inclusivity of curriculum between states nation-wide in 2019. They reported that Minnesota state respondents engage tribal government in advocacy and support of Native Education and curriculum a moderate amount – on par with 9 other states, but behind 5 states (of the 28 reported). Additionally, Minnesota scored a 6-8/12 on implementation of Native American education, indicating some components have been implemented, but there is still more work to do (National Congress of American Indians, 2019). This provides the basis for improvement and implementation to improve inclusivity in the Minnesota curriculum.

IMPLEMENTATION

Implementing this alternative in a fast, efficient, and effective manner has the potential to provide tangible outcomes and benefits to American Indian students, as well as communities as a whole. An overview of the process and adoption of curriculum at baseline helps determine where tangible change can occur to implement this alternative.

The process beings with the formal creation of a standards committee. Anyone may apply to be on the committee, but final selection is done by the Commissioner. Mandates require representation from the following groups: parents, licensed teachers, principals, higher education faculty, school boards, the business community, and the Tribal Nations Education Council (TNEC). The commissioner chooses applicants based on a variety of factors, and ultimately chooses between 24-45 people to serve. The current committee includes 38 members from different organizations, primarily in the form of school districts, higher education institutions, and other organizations (Minnesota Department of Education, n.d.).

The next step in the curriculum review process is to determine strengths and weaknesses of current standards, determine changes that need to be made, and draft a new copy of standards. From there, they post revised standards, collect public input, and subsequently considers this input to write another draft. This goes through a second round where expert reviewers analyze the standards, often with rounds of review repeated and many iterations produced. After the final draft is sent to the commissioner, they are approved and begin the 1-2 year long process of adopting them into administrative rule and implementation (Minnesota Department of Education, n.d.).

While this current processes is tried and true, in order to achieve a more diverse curriculum that is more reflective of the students taught, additional measures should be incorporated into this process.

1) Formalizing goals and values specific to that curriculum review, prior to start of the process
2) Increase diversity in committee pool and final selection
3) Provide support in adoption in schools
4) Apply to future curriculum reviews

Step 1: Goal setting

The commissioner should draft guiding values and goals prior to revision of the current curriculum. Preliminary goal and value setting creates a structure and framework within which the rest of the review will take place. Initial drafts should be created by the Commissioner himself – as informed by broader goals set by the Governor and MDE – then further edited and refined with the final committee. This provides the expectation that very specific diversity goals be met, and permits a fundamental rework of the curriculum, rather than marginal changes and updates.

Step 2: Inclusive Committee:

Next, in assembling the committee, the commissioner should perform outreach to encourage diverse applicants. As it stands, the groups required to be present on the committee lack representation, so without making extra effort to recruit and include communities and members that wouldn't otherwise be considered, the committee will fall victim to bringing the status quo, and not promote change that is required for progress.

The NCAI emphasizes the involvement of Native stakeholders is vital to quality change. Examples of individuals that need to be included in the discussion include: Native American state legislators, Governor's offices, Office of Indian Affairs within state government, Tribal leaders and tribal education departments, Native American students and local school boards, and state education agencies, including Superintendent's office, curriculum staff, Title I staff, equity staff, or other stakeholders responsible for ensuring an equitable and quality education (National Congress of American Indians, 2019).

For Minnesota, the best way to develop these partnerships is to utilize preexisting relationships with Tribal nations and organizations. Examples of these organizations include: American Indian parent advisory committees (AIPIC), Minnesota Indian Affairs Council (MIAC), Minnesota Indian Education Association (MIEA), and The Coalition to Increase Teachers of Color and American Indian Teachers (TOCAIT) in Minnesota. Additional partnerships could come from national organizations such as the NIEA, and Tribal Nations Education Committee (TNEC).

Tangible steps to diversifying this committee includes increased transparency and marketing of the curriculum review timeline and process. Increasing the marketing and call for Committee members in these communities can promote larger and more diverse applicant pools. From there, the Commissioner should review applicants with broader interpretations of meeting qualifications. Current factors considered in selecting committee members includes: content expertise, discipline expertise, representation (communities, stakeholders, geographic regions, district sizes, school types, grade levels), racial and gender diversity, and expertise in educating specific student demographics or leading specific class types (Minnesota Department of Education, n.d.). By broadening the interpretation of some factors, or even expanding the committee to provide more space for American Indian representation would allow more voices to be part of an integral change, impacting students across Minnesota.

Step 3: Adoption

Ultimately, the effectiveness of the implementation of this alternative could be highly determined by school adoption of these changes. After the curriculum is developed, it is sent to schools with a set time for adoption and transformation. As it stands, Minnesota cannot require schools to incorporate Native American standards into their teaching practices. MDE can include native education content in their standards, but schools are only required to offer all standards, not that all students are required to take all standards. This poses a large gap in the implementation of Native American education in every students' public school experience.

Currently, the impetus is on the TNEC and members of MDE Office of American Indian Education to develop a repository of curriculum for districts and schools to adopt (National Congress of American Indians, 2019). Proactively using the review committee as a workforce to provide a preliminary canon of literature and resources for schools would lower the barrier and work for schools and volunteers currently working through this process.

Step 4: Apply to future curriculum reviews

The most immediate timeline of implementation comes with the Academic Standards in Social Studies, which has already begun its review process. Throughout 2020, initial committee meetings and public review and comment periods have already lapsed. The timeline for 2021 includes three more committee meetings in March, April, and May. As such, this curriculum review could start at step 3: providing resources to schools to accompany any updates and advancements of American Indian education.

One of the largest barriers to incorporating Native American education in the classroom are current limitations on breath of standards across disciplines. Often, standards including American Indian education are limited to history and social studies (National Congress of American Indians, 2019). Incorporating more Native voices and actively considering this issue in every subject area could provide new and unique ways to incorporate Native American education into the curriculum of students across Minnesota. The next review cycle is Mathematics, which should implement this alternative through these steps. While face value, it might appear difficult to incorporate Native voices in these curriculums, step 3 could provide significant change, if accompanying materials to the standards are less ethnocentric and include diverse examples. This should continue through all forthcoming reviews, regardless of subject area.

The current landscape of American Indian education in Minnesota is constantly changing in developing. It is likely policy and regulatory changes may occur throughout the duration of upcoming standards review. This recommendation establishes a baseline for changes, though additional measures for inclusivity and diversity in the curriculum and process would be welcome. Ultimately any institutional changes to promote American Indian education and inclusivity is preferred to status quo.

Appendix A. Benefit Estimation Process

Estimating benefit per student:

In evaluating alternatives to improve American Indian student outcomes, I began by quantifying the added benefit of an American Indian student moving from not-graduating to graduating from high school in Minnesota. The Alliance for Excellent Education's initiative, "The Graduation Effect" measures the potential benefits accrued by increasing graduation rates. While the project holistically looks at national rates, with a goal of achieving 90% graduation rate, they also break it down by state and demographic. Their project focuses on potential short and long-term benefits to the community with an increase in graduation rates. These projected outcomes include: job creation, home sales, auto sales, earnings, disposable income attributed to spending, savings in healthcare, changes in GDP, and changes in state, local, and federal taxes.

For the purposes of this project, these will be projected as baseline costs of low graduation rates. The data for this analysis utilized 2015 graduation rates and economic indicators. Using their 52% estimation of American Indian graduation rates in Minnesota in 2015 along with raw graduation data from MN SLEDS, I extrapolated data used to determine cost per student not graduating.

To do this, I identified a 2015 American Indian student graduation rate of 716 students. A 52% graduation rate indicates 661 American Indian students did not graduate on time, making a rough estimate of a 100% graduation rate being 1377 students. Because this project measures costs in a percent increase of graduation rates, I identified that to move from 52% (716 students) graduating, to the 90% (1239 students), indicated costs identified are attributed to a 523 increase in American Indian students graduating.

After identifying the number of students represented in their projections, I estimated a cost per head for each economic indicator. For the purposes of this project, increase in state, local, and federal taxes were not included in costs, as they represent an economic transfer, not economic growth. Adding the per capita economic growth as a result of graduating high school resulted in an estimate of $58,865.04 cost per student, at the mid-point of their career. Because this project identifies the mid-point as age 39, net present value (at a rate of 3%) was calculated, with adjustments for inflation to 2021 dollars, resulting in a cost estimate of $34,318.04. This is surely an underestimation, with some potential economic growth factors not considered nor calculated here, and with numbers reported by The Alliance for Excellent Education cited as conservative estimates. While this report presents this as a cost, this is a baseline estimate, and thus any improvement in graduation will result in this per capita price being attributed as a benefit of the alternative.

Shortcomings in the literature, program evaluation, and effectiveness for American Indian students impede strong conclusions to be drawn on the outcome of increased number of graduated American Indian students given an intervention. As such, each alternative will be evaluated based on how many students would need to graduate for benefits to outweigh costs of the program, at mid-point in career. This will be followed by a discussion of the probability this will net positive or negative based on these calculations.

Appendix B. Benefit Calculation

Indicator	Number	Source
Graduation rate (2015)	52%	all4ed.org
Number of AI/AN Graduates (2015)	716	MN SLEDS
Number of AI/AN non-Graduates (2015)	661	Extrapolated
Total AI/AN Seniors (2015)	1377	Extrapolated
90% graduation rate (2015)	1239	Extrapolated
Would require increase of:	523	Extrapolated

Costs associated with 523 Inc. in grads:	Raw #	Per Grad
State and local tax revenue:	$ 240,000.00	$ 458.69
Health care savings:	$ 7,600,000.00	$ 14,525.14
Individual earnings:	$ 3,700,000.00	$ 7,071.45
Federal tax revenue:	$ 560,000.00	$ 1,070.27
GDP Increase	$ 7,000,000.00	$ 13,378.42
Home Sales	$ 8,500,000.00	$ 16,245.22
Auto sales	$ 1,100,000.00	$ 2,102.32
Increased spending	$ 2,900,000.00	$ 5,542.49
Total Cost		$ 58,865.04
Adjusted for inflation:		$ 65,756.91

Rate=	3%
COSTS	
2021	0
2022	0
2023	0
2024	0
2025	0
2026	0
2027	0
2028	0
2029	0
2030	0
2031	0
2032	0
2033	0
2034	0
2035	0
2036	0
2037	0
2038	0
2039	0
2040	0
2041	0
2042	$ 65,756.91
NPV:	$34,318.04

Appendix C. Equity Calculations

Equity Baseline:

The "Knocking at the College Door" project estimates graduation rates for states and demographics through 2036, by using accumulated data from many sources since 2000. Using this projection, it is estimated that graduation rates for white students in Minnesota public school will decrease by 14% by 2036, and Native American/American Indian[2] students will decrease 7%. Thus, the achievement gap, as estimated by differences in changes in graduation rates between whites and Native Americans is projected to decrease by 7 percentage points over the next 15 years. As such, my evaluation will attempt to determine if each alternative will further benefit this change, thereby increasing the rate at which graduation rates between Native Americans and their white counterparts are comparable.

Projections from: Knocking At The College Door

Time	Year	White	AI/AN	Hispanic:	APIA	2+ Races	Non-white sums:
0	2021	42,855	699	4950	4337	2156	12142
1	2022	42,734	696	5500	4327	2762	13285
2	2023	42,281	664	5570	4520	3064	13818
3	2024	42,477	690	6050	4409	3377	14526
4	2025	42,504	748	6370	4744	3713	15575
5	2026	42,169	766	6430	4725	3825	15746
6	2027	40,867	784	6350	4979	3840	15953
7	2028	40,432	729	6210	4901	3793	15633
8	2029	39,807	703	5810	4884	3980	15377
9	2030	39,703	766	6100	5113	4037	16016
10	2031	39,818	746	6550	5191	4088	16575
11	2032	39,695	707	5680	5491	4183	16061
12	2033	39,501	708	5950	5513	4300	16471
13	2034	39,124	697	6000	5533	4416	16646
14	2035	37,953	682	6180	5450	4455	16767
15	2036	37,006	649	6110	5408	4420	16587
Change:		-5,849	-50	1160	1071	2264	4445
Rate of change:		-14%	-7%	23%	25%	105%	37%

[2] These calculations only include AI/AN individuals that do not account for individuals that identify as more than one race

Appendix D. Alternative 1 Equity Calculations

(Used estimates and extrapolations)

2019 graduates:	958
# MN Teachers	63,000
% TOCAIT	4%
Diverse teachers	2520
Estimated American Indian teachers	630
Estimated inc. in Am In teachers	10%
New total	693
Inc. in Am In. Teachers	63
Avg. Class size:	20
# Am In students reached per teacher:	3
# Am In students reached:	189
Original graduation rate of these students:	98
With new teacher:	13
Percent increase:	1.33%
Benefits:	$438,461.01

Appendix E. Alternative 2 Costs

GS PAY SCALE			Rate:	3%	
Time	Year	Grade		COSTS:	Benefits:
0	2021	GS-9	1	$57,447	$0.00
1	2022	GS-9	2	$59,362	$0.00
2	2023	GS-9	3	$61,227	$0.00
3	2024	GS-9	4	$63,191	$0.00
4	2025	GS-9	4	$63,191	$0.00
5	2026	GS-9	5	$65,106	$0.00
6	2027	GS-9	5	$65,106	$0.00
7	2028	GS-9	6	$67,021	$0.00
8	2029	GS-9	6	$67,021	$0.00
9	2030	GS-9	7	$68,936	$0.00
10	2031	GS-9	7	$68,936	$0.00
11	2032	GS-9	7	$68,936	$0.00
12	2033	GS-9	8	$70,851	$0.00
13	2034	GS-9	8	$70,851	$0.00
14	2035	GS-9	8	$70,851	$0.00
15	2036	GS-9	9	$72,765	$0.00
16	2037	GS-9	9	$72,765	$0.00
17	2038	GS-9	9	$72,765	$0.00
18	2039	GS-9	10	$74,680	$0.00
19	2040	GS-9	10	$74,680	$0.00
20	2041	GS-9	10	$74,680	$0.00
21	2042	GS-9	10	$74,680	$ 65,756.91
NPV:				$1,075,325.06	$34,318.04

Inc. in # graduates: 31

2019 graduates: 958
% change required : 3%

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