

The Impact of Indian Gaming on Indian Education in New Mexico

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Abstract

Since passage of the Indian Gaming Regulatory Act in 1988, almost two-thirds of the tribes in the 48 contiguous states have participated in the establishment of over 400 casinos. In 2006, Indian gaming generated net revenues exceeding \$25 billion, with evidence suggesting the investment of gaming dollars into a broad array of social, economic and governmental programs (National Indian Gaming Association, 2009). One area argued to be benefiting from the flow of Indian gaming revenues is Indian education. The purpose of this paper is to explore the potential influence of gaming on Indian education through an analysis of schools in New Mexico identified as serving predominantly Indian students. Our expectation is that schools serving students from gaming nations will demonstrate favorable differences compared to non-gaming schools in terms of school quality, retention, performance, and preparation for higher education. The findings suggest that the presence of gaming is associated with positive educational differences in Indian education, as schools with students from gaming nations outperformed their non-gaming counterparts on more than three-fourths of the variables examined. We supplement these results with survey data and an interview of a tribal education director to understand how gaming dollars are being used by one nation to meet the needs of their youth. The paper concludes with a call for additional research in this area.

The Impact of Indian Gaming on Indian Education in New Mexico

In 2006, Indian gaming revenues reached an astounding \$25.7 billion, representing more than half of all gaming dollars in the United States (National Indian Gaming Association [NIGA], 2009). Under the purview of the Indian Gaming Regulatory Act (IGRA) of 1988, which established the legal foundations of casino style gaming, Indian gaming was intended to improve the quality of life for native people by “promoting tribal economic development, self-sufficiency, and strong tribal governments” (e.g. Anders, 1998; Eadington, 2004; McCulloch, 1994). Since the bill was signed into law, Indian gaming has surpassed the expectations of lawmakers and tribal leaders alike (Meister, 2007). Today, according to

Meister (2007), there are 227 tribes out of approximately 350 in the lower 48 states who participate in casino style gaming, offering a range of games from slot machines to bingo. These gaming nations are found in 30 states and operate over 400 gaming facilities.

Although not all Indian gaming enterprises have been successful, tribal governments have come to view gaming dollars as a critical revenue stream necessary to support important public services (Taylor and Kalt, 2005). Surprisingly, little systematic research has explored the relationship between Indian gaming and the social and economic consequences on American Indian communities (see Gardner, Kalt, and Spilde, 2005). There is, however, a mounting body of anecdotal evidence suggesting the large role of gaming revenues in supporting an array of tribal initiatives, including many geared to the improvement of Indian communities (e.g. NIGA, 2006). More generally, in a recent annual report released by the National Indian Gaming Association (NIGA, 2006), six tribal government services were identified as being the primary recipients of gaming dollars. Of these six, a “catch-all” category including education, child/elderly care, culture and charity, received the highest investment of gaming dollars, representing approximately 20% of all net gaming revenues in 2006; a pattern also evident in 2004 (NIGA, 2004). While it is not possible to discern individual priorities within this category, this substantial investment begs the question – Beyond the economic impacts of Indian gaming, what social impacts is gaming having on tribal members of those native nations who pursue this option?

This paper attempts to address this question and improve our understanding of social impacts by exploring the role that gaming may be playing in shaping various aspects of Indian education in New Mexico. The pueblos and tribes in New Mexico have opted not to engage in per capita payments and instead are investing in a broad range of social programs to enhance tribal communities, including multiple educational initiatives (Gallagher, 2005). Nations are supporting such activities as after-school programs, scholarships and internships, and cultural restoration programs (Gallagher, 2005; Pojoaque, 2009; Sandia Pueblo, 2007). To determine if these and other activities are making a difference, we explore potential impacts at secondary schools in New Mexico identified as serving predominantly American Indian students. Our general expectation is that high schools serving students from gaming nations will demonstrate favorable differences compared to non-gaming schools across four distinct areas: school quality, student performance, retention, and student preparation for higher education.

The paper’s next section will provide a brief overview of the Indian gaming literature surrounding the impacts of gaming. We then outline our basic research strategy for detecting possible impacts on Indian education, followed by a discussion of differences between high schools serving predominantly Indian populations in New Mexico from gaming and non-gaming nations. We also present additional evidence from a parent survey and case study that serves to buttress the argument of a positive linkage between gaming and educational differences. The last section concludes with a call for additional research, while emphasizing the limitations of our analysis and the importance of education as a mechanism of both economic and social change.

The Impact of Indian Gaming

The Emergence of Indian Gaming

The IGRA followed a well known Supreme Court case, *California v. Cabazon* (1987), pitting states rights against the rights of tribes as sovereigns to operate casino style gaming on tribal land. Congress responded to the Supreme Court's decision, which upheld the ability of tribes to offer gaming unencumbered by state interference if the state did not prohibit gaming, by passing one of the most significant laws in the history of federal Indian policy. The goal of the IGRA was to "provide a statutory basis for the operation of gaming by Indian tribes as a means of promoting tribal economic development, self-sufficiency, and strong tribal governments," as well as, "shield [tribal governments] from organized crime and other corrupting influences" (IGRA, 1988). According to Section 11 of the IGRA (1988), the use of gaming revenues by Indian tribes is restricted to five specific activities: (1) to fund tribal government operations or programs, (2) to provide for the general welfare of the Indian tribe and its members, (3) to promote tribal economic development, (4) to donate to charitable organizations, or (5) to help fund operations of local government agencies. The primary expectation of Congress was that gaming would provide tribes with a viable revenue stream necessary for improving the quality of life in Indian Country (e.g. Anders 1998; Light and Rand 2005; McCulloch 1994).

Among other provisions, the IGRA provides explicit rules for the regulation of Indian gaming. The IGRA identifies three classes of gaming: Class I, Class II, and Class III. Gaming classified as Class I involves games of minimal value and typically are associated with the traditions or culture of a tribe (Light and Rand 2005). The regulation of Class I gaming activities belongs to tribal authorities exclusively and is not subject to the requirements of the IGRA. Class II gaming is primarily associated with bingo and certain kinds of other games (e.g. pull tabs), and is regulated by both tribal authorities and federal officials, but not subject to state involvement. Class III, or Las Vegas style gaming, is the highest grossing form of gaming and includes slot machines, table games, and horse and dog racing. Federal, state, and tribal authorities oversee the regulation of Class III gaming activities.

The pueblos and tribes in New Mexico were in the gaming business well before the signing of the IGRA, with Acoma and Sandia Pueblos operating bingo halls since the early 1980s (Mason, 2000; Mays and Taggart 2005). As of 2009, 14 of the 22 tribes and pueblos in the state operate Las Vegas style casinos, and three additional Nations have signed compacts with the state in anticipation of opening gaming facilities.ⁱ The most recent compact, signed by nine of the 13 gaming nations as well as two non-gaming pueblos (Nambe and Picuris), extends gaming until the year 2037 (New Mexico Gaming Control Board, 2008).ⁱⁱ In a January 2007 article by Jones in the *Albuquerque Journal*, the Governor of Tesuque and chairman of the New Mexico Indian Gaming Association (NMIGA), Charlie Dorame, commented on the importance of the gaming compacts to Native nations saying, "The extended term will provide tribes with long-term financial security for the foreseeable future."

Measuring the Impacts of Indian Gaming

When reviewing investigations examining the impact of Indian gaming, a couple of observations can be made. One is that researchers typically divide the effects of casino style gambling into two broad categories of economic and non-economic or social impacts. Much of this work has viewed the

economic and social variables as falling on two different sides of a spectrum (Center for Applied Research 1996; Collins and Lapsley, 2003). On one side, scholarly work has identified economic impacts as desired benefits resulting from the adoption of gaming (e.g. Tiller and Chase, 1998). On the other, social impacts such as compulsive gambling and crime have been calculated as costs associated with gaming (e.g. Thompson and Rickman, 1996). This distorted cost-benefit analysis ignores potential positive social impacts (and negative economic effects) that may flow from gaming dollars, such as improvements to education, housing stocks, or health. Instead, most studies focus on the perceived economic benefits of Indian gaming such as increased employment and lower rates of poverty, resulting in a simplified and incomplete analysis of gaming's impacts on Indian and non-Indian communities (Light and Rand, 2005).

A handful of these investigations have offered measurable impacts on tribal communities, where researchers have attempted to examine differences between gaming and non-gaming Nations in regards to such economic dimensions as income levels, poverty, and unemployment (Conner and Taggart, 2009; Thompson 2005). These studies that have focused on tribal communities have also been more likely to consider the social benefits as opposed to just the social costs of gaming. Both U.S. states and native nations have reported social gains in areas where Indian gaming has been established (i.e. Bangsund and Leistriz, 1997; Conner and Taggart, 2009; Taylor and Kalt, 2005; Thompson, Gazel, and Rickman, 1996). Multiple examples of particularized social benefits across Native gaming communities dot the pages of NIGA reports. Studies have focused on how tribal governments have allocated gaming dollars towards strengthening Indian communities through investments made in elderly and youth facilities (NIGA, 2006), improved housing stocks (Reeves and Associates, 1996), law enforcement (NIGA, 2006), and much needed infrastructure improvements (Anders, 1998). Other studies have investigated how gaming revenues have funded cultural preservation and revitalization projects such as tribal history courses and language immersion programs (e.g. Spilde, Taylor, and Grant, 2002).

With a few exceptions, studies that focus on Indian gaming's influence on education offer primarily anecdotal evidence. The 2006 NIGA provides an abundance of case studies dedicated to showcasing several gaming nations across the U.S. The report explains how various tribal communities are using gaming dollars to reach out to their youth through tutoring, after school programs, and the establishment of scholarships for qualified college bound graduates (NIGA, 2006). In many instances, native nations are beginning to build their own schools directly on the reservation, giving them more control and authority over their children's educational experience (Tiller, 2005). All of these endeavors are designed to improve access to critical resources necessary for student success in the classroom and to improve the general quality of the education American Indian students receive.

Although anecdotal evidence would suggest that students from gaming Nations have an advantage over students from non-gaming nations in regards to educational resources, it is difficult to determine whether measurable differences truly exist. Several issues, including the lack of reliable data, contribute to the limited amount of quantitative evidence to support impacts on education (Conner and Taggart, 2009). Our objective is to take a more rigorous look at this issue through an analysis of schools and school districts serving students from gaming and non-gaming nations. Hoenack and Renz (1995), in a

study examining the economic impacts of Indian gaming in rural Minnesota, suggest a number of areas of exploration to assess gaming's influence, spanning academic progress and performance, school attendance, and test scores. We now turn to a discussion of our research strategy to examine these and other aspects of education within the context of Indian gaming in New Mexico.

Methodology

Our goal is to discern if there is a relationship between the presence of Indian gaming and Indian education in the state of New Mexico across a series of measures including school quality, student performance, student retention, and student preparation for higher education. Our research strategy involves comparing secondary public schools serving Indian students from gaming and nongaming nations on these different dimensions, with the expectation that schools linked to gaming will compare favorably to schools drawing students from nongaming nations. These findings are buttressed by a parent survey that probes parents' perception of the quality of their child's school, as well as a case study of how one particular gaming nation in New Mexico is investing gaming revenues in education to put these differences into context.

With a couple exceptions as noted below, our unit of analysis will be high schools located in school districts identified by the Indian Education Division of the New Mexico Public Education Department (NMPED) as serving American Indian student populations from the 22 pueblos and tribes within the state. By looking at the 9th through 12th grades, we strive to offer a more complete picture of Indian education, exploring more than students' performance on tests, but also how prepared students are for higher education and whether issues identified in the literature, such as Native American student retention, have been positively or negatively affected in the wake of gaming (Rampey et. al., 2006).

The NMPED Indian Education Division identifies 23 out of a total of 89 school districts in the state as serving predominantly Native American students. According to NMPED website, the Native American student population in New Mexico was 36,420 in the 2005-06 school year; approximately 11% of school age children in the state. Of this group of students, 35,042 attend school in the 23 "native" districts identified by the Indian Education Division, or 97% of all Native American students in the state.ⁱⁱⁱ The analysis consists of a total of 36 public schools, including 34 high schools serving grades nine through 12, and the 9th grades of two middle schools for three variables. For purpose of analysis, private schools, charter schools, and schools in the Albuquerque and Santa Fe school districts were excluded for various reasons, including size, unique characteristics, and lack of data.

The next step was to match these 36 schools to one of the 22 pueblos and tribes in the state. We utilized information from three sources to match each school with a pueblo or tribe, including *Indian Education Status Reports* (NMPED, 2006; Werito, 2005), *Tiller's Guide to Indian County* (Tiller, 2005), and Indian Policies and Procedures (IPP) agreements signed by the school district and a particular Indian nation. In virtually every instance, these sources were in complete agreement regarding the matching of our 36 schools with a particular nation, while the rare exceptions were guided by the two sources in the majority.^{iv}

Lastly, in light of these pairing, we then classified each of the 36 schools as serving students from either a gaming or nongaming nation. The decision as to whether or not a tribe is gaming or nongaming is based upon the existence of an operating casino as of January 1, 2004, the earliest data point in the

analysis. There were a total of 13 tribes with active gaming operations and nine without. This produced 13 gaming schools and 23 nongaming schools, representing 12 of the gaming nations and 5 of the nongaming.^v Most of the gaming tribes and pueblos have engaged in gaming dating back to the early to mid 1990s under earlier compacts, allowing considerable time for possible impacts associated with gaming to manifest (Conner and Taggart, 2009; Mason, 2000). We expect a gap to exist between the two groups, with the schools and students linked to gaming outperforming their nongaming counterparts across a number of education measures.

Table 1

Description of Variables

Variable	Description
School Quality¹	
Meets Adequate Yearly Progress (AYP) in 2006-07	School does not meet AYP School meets AYP
Duration of not meeting AYP as of 2006-07	3 years or less 4 years or more
Student Performance²	
9 th Grade Science Proficiency	Percent of American Indian students proficient or above
9 th Grade Math Proficiency	Percent of American Indian students proficient or above
9 th Grade Reading Proficiency	Percent of American Indian students proficient or above
11 th Grade Math Proficiency	Percent of American Indian students proficient or above
11 th Grade Reading Proficiency	Percent of American Indian students proficient or above
Student Retention³	
Average Graduation rate between 2004-05 and 2006-07	Three year average graduation rate for American Indian students
Attendance Rate 2005-06	American Indian attendance rate 9 th – 12 th grades
Preparation for Higher Education⁴	
Average SAT I Verbal Scores for 2004-05 and 2005-06	Two year average SAT verbal scores for all students
Average SAT I Math Scores for 2004-05 and 2005-06	Two year average SAT math scores for all students
Percent Enrollment in Advanced Placement (AP) Classes 2006-07	Percent American Indian enrollment in 9 th – 12 th grade AP Classes

¹ Based on State District Report Cards released annually by school districts and organized by the New Mexico Public Education Department (NMPED).

² NMPED's statistics and data files for 2006-2007.

³ NMPED's statistics and data files for years between 2004-05 and 2006-07.

⁴ New Mexico Higher Education Department (2008).

Table 1 provides a description of the variables used in our analysis spanning the four areas of Indian education including school quality, student performance, student retention, and preparation for higher education. The data informing this study represent different school years between 2004-05 and 2006-07, and were drawn from multiple sources, including New Mexico District Report Cards as required under the No Child Left Behind Act (NCLB) of 2001, and materials compiled by the NMPED and the New Mexico Higher Education Department (NMHED).^{vi} The analysis consists of 12 indicators: two from State District Report Cards, seven from NMPED statistics and data file sets, and three from the NMHED. All but one measure is available at the school level, with Advanced Placement (AP) enrollment measured at the district level.^{vii} If the information was available, a few variables have been averaged for two or three years in order to account for minor fluctuations from year to year. In eight instances the information is examined for American Indian students only.

The method of analysis is relatively straightforward. For variables measured at the interval level, we look at the distribution of cases and the difference of means between gaming and non-gaming schools. We expect that the gaming group will demonstrate higher rates of proficiency, retention, and school quality than the non-gaming group. For nominal and ordinal level measures, we look at the overall distribution of cases between the two sub-groups. Tests of significance are not included as they serve no legitimate statistical purpose given the use of a non-random sample; nor will we seek to generalize our findings to a larger population. To the extent that the data are reliable and valid, our results are reflective of true differences between the two groups of schools. It is also the case for those wishing to evaluate such information that none of the differences reported herein achieved significance using a one-way ANOVA test of significance at conventional levels ($p < .1$), though a few were close. Due to missing data spanning most of the variables, the analysis also report the number cases for each measure.

Indian Gaming and Educational Differences

Table 2 presents our findings concerning differences in school quality. The first half of the table displays the percentage of schools in each gaming sub-group that met AYP standards in 2006-2007, while the second half presents the percentage of schools as of 2006-2007 who failed to meet AYP for three years or less and those who have failed to meet it for four years or more. Perhaps what is most striking about the results found in Table 2 is the poor performance of all the schools under NCLB; almost two-thirds of the schools serving Indian students have failed to meet AYP for four years or more. Although it is the case that a higher percentage of gaming schools met AYP in 2006-07 compared to nongaming schools, this comparison is based on just three schools. Even still, the higher number of gaming schools meeting AYP in our analysis does reflect the ability of such schools to meet or exceed a number of state established benchmarks based on student attendance rates, proficiency, and other measures that we will examine more closely in the tables to follow. However, of the gaming and nongaming schools who are failing to meet AYP, it would appear that the gaming schools who make up the smallest share are in the most distress, with a larger percentage of nongaming schools falling into the category of three years or less, working against our expectation regarding the performance of gaming schools.

Table 2

*Two Measures of School Quality Comparing Public High Schools Serving American Indian Students from Gaming and Nongaming Nations in New Mexico in 2006-07**

		Schools serving students from gaming nations (N=13)	Schools serving students from nongaming nations (N=23)	Percent Difference
Adequate Yearly Progress (AYP)				
Schools meeting AYP in 2006-07	Number of Schools	2	1	11.03
	Percent	15.38	4.35	
Schools Failing to Meet AYP in 2006-2007 for:				
3 Years or less	Number of Schools	4	9	-8.36
	Percent	30.77	39.13	
4 Years or more	Number of Schools	9	14	8.36
	Percent	69.23	60.87	

*Source: NM District Report Cards (2007)

Table 3 presents the mean percentage of American Indian students that scored “proficient and above” on five standardized tests administered throughout the state as part of NCLB. Differences are reported between gaming and non-gaming schools on 9th grade science, math, and reading tests, as well as 11th grade math and reading tests in 2006-07. Students at the schools associated with gaming outperformed their counterparts in four out of five instances, although once again the overall level of performance is disheartening.

At the 9th grade level, the gaming group shows the greatest difference on the math proficiency test, with a 3.12% higher percentage of students who scored proficient or above than the non-gaming group, which includes three schools that had percentages below that of the lowest gaming school. The gaming group also showed more than a 2.73% favorable gap with the non-gaming group in regards to the 11th grade reading test and an even greater disparity of 5.66% over the non-gaming group on the 11th grade math proficiency test. Such differences are far from trivial, and suggest that students from gaming nations are testing marginally better than students from non-gaming nations, an important finding as American Indian and other historically underrepresented groups attempt to close the test score and achievement gap that persists across the education system (Ortiz and HeavyRunner 2003).

Table 3

Five Measure of Student Performance Comparing Public High Schools Serving American Indian Students from Gaming and Nongaming Nations in New Mexico in 2006-07

American Indian Students Scoring “Proficient or Above” on:		Schools serving students from gaming nations	Schools serving students from nongaming nations	Percent Difference
9 th Grade Science Exam	Mean Percent	23.58	22.06	1.52
	Standard Deviation	10.37	10.85	
	Number of Schools	11	20	
9 th Grade Math Exam	Mean Percent	23.51	20.39	3.12
	Standard Deviation	14.67	10.77	
	Number of Schools	11	20	
9 th Grade Reading Exam	Mean Percent	29.16	29.24	-0.08
	Standard Deviation	11.67	9.29	
	Number of Schools	11	20	
11 th Grade Math Exam	Mean Percent	20.16	14.50	5.66
	Standard Deviation	14.04	10.20	
	Number of Schools	10	20	
11 th Grade Reading Exam	Mean Percent	34.23	31.50	2.73
	Standard Deviation	14.61	11.31	
	Number of Schools	10	20	

* Source: NMPED Statistics and Data Files (2008)

Table 4 summarizes information concerning student retention, focusing on American Indian graduation and attendance rates between the two groups. Graduation rates are reported as a three year average between 2004-05 and 2006-07, while attendance rates are only available for the 2005-06 school year. In examining the table, schools serving students from gaming nations demonstrated an almost 4% higher graduation rate for the three-year period than their counterparts. Also worth noting is the fact that the gaming group saw an increase in the number of graduating American Indian students every year since 2004-05, while the non-gaming group actually witnessed lower graduation rates in 2006-07 compared

to two years earlier. Thus it would appear that schools with students from gaming nations are experiencing a higher degree of success in regards to American Indian student outcomes than their non-gaming counterparts, lending further evidence to the possible role of Indian gaming dollars in tribal education programs designed to help native students succeed (NIGA 2006). Although we hesitate to overstate the importance of Indian gaming revenues in the differences we see in the tables, identifying the source of such improvements is important to combating the high dropout rates in secondary education that persist among American Indian populations (NCES 2008).

With respect to attendance rates, the second measure in Table 4 shows little difference between the two groups, with the gaming schools displaying a marginally higher rate. This may not be too surprising given that the national average high school attendance rate remains above 90%, even when looking across race and ethnic groups. An analysis of more years would be beneficial but the NMPED has not explained its failure to release more data, including information for the most recent year. Even still, attendance is identified as an important measure of school quality with the NCLB that gaming schools appear to be performing marginally better at.

Table 4

*Two Measures of Student Retention Comparing Public High Schools Serving American Indian Students from Gaming and Nongaming Nations in New Mexico between 2004 and 2007**

American Indian Student:		Schools serving students from gaming nations (n=10)	Schools serving students from nongaming nations (n=17)	Percent Difference
Average graduation rate between 2004-05 and 2006-07	Mean Percent	83.70	80.08	3.62
	Standard Deviation	8.87	9.77	
Attendance rate in 2005-06	Mean Percent	91.69	91.29	0.40
	Standard Deviation	3.42	2.62	

*Source: NMPED Statistics and Data files (2008)

The last part of the analysis looks at differences in American Indian student preparation for higher education and is summarized in Table 5. Preparation for higher education is measured using average student scores on the SAT and American Indian enrollment in Advanced Placement (AP) courses. The first half of the table displays performance on the SAT. SAT scores are reported for both the verbal and math sections, and calculated as a two-year average for school years 2004-05 and 2005-06. As expected, the gaming group scored higher than the non-gaming group on both forms of the SAT. More specifically, schools with students from gaming nations had an average SAT verbal score that was 46.86 points higher than schools with students from non-gaming nations, while the SAT math scores average a little more than 23 points higher. This is a very important difference between the two groups

of schools because it demonstrates not only a difference in the K-12 experience of students, but also students' intentions and preparation to pursue a college degree. Furthermore, such improvements as seen in the gaming group of this analysis can lead not only to better access to public universities, but access to higher quality institutions with better programs and services that can help students overcome barriers to success once in college (Bowen and Bok 1998). It is important to point out, however, that the nongaming schools have a higher percentage of Indian students than those schools serving students from the gaming nations.

Regarding the second measure of preparedness, there does not appear to be a substantial difference between the two groups in regards to the percent of native students at the district level participating in Advanced Placement (AP) programs in 2006-07. For instance, the results in Table 5 would suggest a slight difference, with the gaming group having a marginal 0.45% higher enrollment in AP courses than their nongaming counterpart.

Table 5

*Three Measures of Student Preparation Comparing Public School Districts and Public High Schools Serving American Indian Students from Gaming and Nongaming Nations in New Mexico in 2004-05 and 2006-07**

All Students:		Schools serving students from gaming nations (n=9)	Schools serving students from nongaming nations (n=11)	Score Difference
Average SAT 1 Verbal Score for 2004-05 and 2005-06	Mean Score	532.00	485.14	46.86
	Standard Deviation	54.83	51.34	
	Percent American Indian	25%	60%	
Average SAT 1 Math Score for 2004-05 and 2005-06	Mean Score	512.78	489.73	23.05
	Standard Deviation	41.83	46.16	
	Percent American Indian	25%	60%	
American Indian Enrollment in:		School districts serving students from gaming nations (n=7)	School districts serving students from nongaming nations (n=5)	Percent Difference
Advanced Placement Classes in 2006-07	Mean Percent	7.28	6.83	0.45
	Standard Deviation	5.60	4.12	

*Source: *New Mexico Higher Education Department (2008)*

If one is willing to acknowledge the smallest of differences across the various indicators, then the gaming schools surpassed the nongaming schools on 10 of the 12 measures, representing each of the four areas of education considered. None of these differences appear particularly dramatic, though even modest differences are not to be dismissed, especially when they emerge across so many dimensions related to education. More specifically, the gaming schools had higher graduation and attendance rates, better scores on the verbal and math portions of the SAT, and higher percentages of American Indian students scoring proficient or above on four out of five standardized high school examinations.

It is also the case that care should be exercised in utilizing these findings by recognizing the limitations of our approach, despite our desire to introduce a more rigorous perspective to the analysis of the non-economic impacts of Indian gaming, which we believe has been achieved to some degree. An important ingredient absent in the present effort is our inability to compare the schools and the students in these schools prior to the introduction of gaming. Unfortunately, this information is simply unavailable which means it is not possible to establish a baseline by which to judge the observed differences. Although indirect, Conner and Taggart (2009) report that in 1990, prior to any major expansion of gaming in New Mexico, the 22 pueblos and tribes shared similar socio-economic characteristics. By 2000, as two groups of nations emerged, those adopting Class III gaming displayed greater improvements on a number of dimensions compared to those opting not to pursue gaming. To the extent that socio-economic conditions are associated with educational performance (e.g. Pascarella et al. 2004; Robinson 2004; Scott et al. 2006), our findings are consistent with the expectation that one should observe positive improvements as the general situation in gaming country changes in favorable ways.

These observed differences suggest an emerging pattern between gaming and education that is also reflected in the perception of parents concerning the quality of their child's school and educational experience. Putting the observed differences between New Mexico public schools in a broader context, we now turn to some additional evidence provided by a parent survey and case study. In a ten question survey administered by the NMPED in 2006-07, parents were asked, using a Likert scale, to report on their satisfaction with a number of aspects of their child's education, spanning such dimensions as the quality of the facility, the performance of faculty and staff, and the ability of the school to meet the needs of their children. On seven of the ten questions, the parents of children attending schools classified as serving gaming nations in our study were overwhelmingly more satisfied than the parents of the other schools, while for the remaining three questions the distribution of responses were marginally different between the two groups.^{viii}

In addition, we supplemented these results with an interview of a tribal education leader to understand how gaming dollars are being used by one nation to meet the needs of their youth, a factor lacking elaboration in our assessment. The person interviewed was chosen for the following reasons: (1) extensive length of service as Director of the tribe's Department of Education; (2) the number of years the tribe has been operating a casino; and (3) the accessibility of the tribe.^{ix} To say that the Department of Education of this particular nation is active in the lives of students and the community is an understatement. They oversee an array of programs that begin as early as kindergarten and stretch all the way through adulthood. The department is responsible for managing programs ranging from after-

school to college prep to adult education. They administer a library, offer courses on language and culture, and provide on-site job training at the tribe's casino or local hotel. The tribe is involved in every stage of a child's development, with the department using home school liaisons to work with families to aid in the students' academic development at each grade level.

The education programs offered by this nation, according to the Director, are funded primarily by the revenues generated by the tribe's on-reservation casino. Also important to note is that both gaming and the Department of Education were adopted by the tribe in the same year of 1995, and the services provided by the department have grown at what appears to be the same rate as the gaming operations. The tribal representative claimed that without the ability of the tribe to operate a gaming facility, the Department of Education would not be what it is today; a far cry from what the tribe could offer students prior to the adoption of gaming.

The Director could also attest to improvements in student outcomes since the department's founding over a decade ago. According to the interviewee, the intimacy of the programs implemented at every level of the students' academic career has translated into positive results in numerous areas. For example, the tribe has seen improvements in student test scores, including reading and math proficiency, attributed to the Department's intensive tutoring programs. Also, student retention has improved through higher attendance rates and the number of graduating seniors from high school. In regards to higher education, the Director reported that more of the tribe's students were pursuing higher education and taking advantage of the scholarship programs available through the Department.

For this particular nation, gaming has played a critical role in allowing the tribe's educational programs to develop. The tribe has observed improvements spanning many of the areas considered in this study. Although these are the experiences of a single gaming nation, they offer a compelling look at how gaming dollars are being invested in a variety of education initiatives as suggested by the NIGA (2006). Furthermore, when taken in light of the differences observed in the quantitative analysis between high schools serving students from gaming nations and high schools serving students from nongaming nations, the experiences of the Director of Education suggest the effectiveness of these programs in meeting student needs and the important role gaming revenues play in supporting their development.

Conclusion

Efforts to understand the social consequences of Indian gaming on Native American communities have lagged behind investigations designed to document economic impacts for multiple and understandable reasons. One of these, no doubt, is the complexity associated with the processes of social change as opposed to the more deterministic economic responses expected to follow after the introduction of gaming. Certainly another factor explaining this preoccupation with economic impacts stems from the prominent place such matters assume in the justification of gaming; indeed, these direct economic influences are expected to gradually redefine the environment found in Indian communities, which in turn, will produce these more subtle but equally important social benefits. But again, this is just one part of the story, and a more thorough understanding of the social impacts of Indian gaming is needed. For these reasons and others, it is also the case that delineating social consequences is hampered by a general lack of comparative data, inhibiting the use of strategies that would allow for greater research

control. Consequently, what is known about these other impacts is limited primarily to case materials and testimonials describing different non-economic initiatives associated with desirable community outcomes and funded by gaming.

Our objective has been to elevate the level of discussion regarding the non-economic impacts of Indian gaming by adopting a framework permitting a more systematic assessment of potential affects with respect to several dimensions of secondary education. This was achieved by examining 12 indicators of school and student performance in the mid-2000s for public high schools serving Indian youth from either gaming or nongaming nations in New Mexico. Due to the unavailability of this information prior to the introduction of Indian gaming in New Mexico, dating back to the mid-1990s, it is not possible to establish a baseline by which to evaluate any observed differences between these two groups of schools. Although inherently limited, a dearth of research in this area suggests even modest efforts can begin to shed light on these matters and perhaps spur additional investigations utilizing more exacting controls that are simply not an option at this juncture. Even though the results were not particularly encouraging for either group, the findings suggest that the schools with students from gaming nations surpassed schools not associated with gaming.

Although the findings of this study are suggestive of gaming's social benefits in regards to Indian education, more research is needed before reaching any definitive conclusions. Stronger research designs, in particular, would greatly improve our understanding of the relationship between the investment of gaming revenues in tribal educational initiatives and improvements in Indian education. Suggestions would be to include a greater number of cases, to explore the influence of gaming across a greater number of education indicators, and to identify data spanning back to before the introduction of gaming. Many tribal Departments of Education keep their own statistics that may provide a more direct measure of student outcomes attributable to such education initiatives as scholarship programs or student support services. Another area that deserves further attention in the debate over Indian gaming's influence on Indian education is a broader understanding of how gaming revenues are being invested in the community, and into what types of programs. Future research may also want to include a larger series of interviews with tribal Education Directors at gaming nations that probe into issues related to departmental goals, design and impact of programs, and the role of gaming dollars in financing the tribe's education initiatives. Special attention should also be paid to the overall scope of programs administered by Education Departments of gaming nations, such as whether they are focused on the primary, secondary, and/or college level of education, as well as whether programs are designed to simply supplement the cost of education or target specific developmental issues through tutoring and other after-school programs that would allow for a more sophisticated understanding of how gaming nations are utilizing revenues in improving student outcomes.

Although gaming may not be a panacea for Indian education today, there is reason to believe based upon the quantitative and qualitative analysis, that gaming dollars may be helping provide important services necessary for American Indian youth to succeed. The decision to engage in gaming does not guarantee student success, but it may prove to be a useful means of attaining the resources that do. Entertaining this idea, gaming may perhaps be better viewed as an effective economic tool in taking down the barriers impeding student academic success. Rethinking the role of gaming as a resource for

tribal Departments of Education may serve to raise the quality of programs in other Native nations as well, and in effect improve retention, proficiency, and other aspects of American Indian educational achievement that has the potential to lead to more broad based economic and social change.

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ⁱ Of the 14 gaming nations, 13 had operations existing prior to 2004, the earliest data point included in our study. The newest entrant is the Navajo Nation which only recently opened a casino near Gallup, NM, but is treated as a nongaming nation. The 13 gaming nations are Acoma Pueblo, Isleta Pueblo, Jicarilla Apache, Laguna Pueblo, Mescalero Apache, the Conner & Taggart. *The Impact of Indian Gaming on Indian Education in New Mexico* 17

Pueblo of Pojoaque, Sandia Pueblo, San Felipe Pueblo, Ohkay Owingeh (formerly San Juan Pueblo), Santa Ana Pueblo, Santa Clara Pueblo, Taos Pueblo, and Tesuque Pueblo. The nations without gaming are Cochiti Pueblo, Jemez Pueblo, Nambe Pueblo, the Navajo Nation, Picuris Pueblo, Santo Domingo Pueblo, San Ildefonso Pueblo, Zia Pueblo, and Zuni Pueblo.

ⁱⁱ The remaining pueblos and tribes, including the Navajo Nation, currently operate under a compact dating to 2001. This agreement is set to expire in 2015 (Fonseca, 2007).

ⁱⁱⁱ The Navajo Nation make up more than 67% of all Native American students in the New Mexico public school system, more than all students from all other Native nations in the state combined. This is not a surprise when considering that there are approximately 250,000 enrolled members in the Navajo Nation today, with a large percentage residing in New Mexico (Navajo Nation 2008; U.S. Census 2000). As a result, a majority of schools in the analysis (53%) serve students from the Navajo Nation, all representing nongaming schools.

^{iv} Not all the pueblos and tribes in New Mexico are represented in the analysis due to the fact that some tribes have relatively small populations and are located in isolated areas, and thus do not have the critical mass necessary to classify a school district as “native” by the NMPED Indian Education Division.

^v The disproportionate number of gaming nations represented in the analysis compared to nongaming is a result of two factors: the number of schools within the vast confines of the Navajo Nation and the fact that most gaming pueblos are in close proximity to one another, and thus more than one pueblo is matched to a particular “gaming” school.

^{vi} The NCLB requires schools to meet Adequate Yearly Progress (AYP) standards as established by the state. In order to meet AYP, school districts must satisfy three requirements: (1) meet or exceed the participation target for reading, (2) meet or exceed the proficiency target for math, and (3) meet or exceed the target for graduation or attendance rates depending on grade level (NMPED, 2007-2008). A district (or school) does not meet AYP if any grade level fails to reach targets in any of the three previously mentioned areas.

^{vii} SAT scores are reported for all races and represent two-year averages, while AP course enrollment is reported for American Indian students but is only available at the district level. Reporting at the district level will not affect the results a great deal given that more than half (67%) of the districts contain only one school. For districts with two or more schools, the data represent an average of the high schools in the district.

^{viii} The parent survey is administered to parents of children at every school in the state and is released in NMPED *District Report Cards* (NMPED, 2004-2006). Unfortunately, the raw data is not available and the information used in this study represents the aggregate responses for each school.

^{ix} The interview was conducted on November 20, 2007.