Small Schools, Big Results:

Nebraska High School Completion and Postsecondary Enrollment Rates by Size of School District

Nebraska Alliance for Rural Education

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About the Nebraska Alliance for Rural Education

The Nebraska Alliance for Rural Education is a partnership between School at the Center, the Center for Rural Affairs, the Nebraska Rural Development Commission, the Local Government Assistance Program, and the Rural Forum (which includes the Nebraska Farm Bureau Federation, Nebraska Farmer's Union, Nebraska Rural Community Schools Association, Class I's United, Nebraska School Finance Coalition, and Friends of Rural Education). The purpose of the Alliance is to launch a broad based coalition of leading rural, farm, and education activists in Nebraska to "build the capacity of rural people to fight for adequate, equitable, and quality rural education and community development as defined and developed by rural people themselves."

The Nebraska Alliance for Rural Education features grassroots organizing, policy research, training for rural activists and school board members, and work with the news media.

This report is part of a series of research aimed at strengthening state-wide policy supporting rural education and rural community schools.

The Alliance believes that:

- State policy should be guided on the basis that equal educational opportunities for Nebraska children are a right guaranteed by the Nebraska Constitution under the Equal Protection Clause.

- State education policy should support schools that are community-based, small in scale, and achieve local, as well as state, goals and standards of quality education.

- State educational financing should recognize cost differences that reflect local circumstances and needs ("fund them as you find them"), promote resource stability and predictability, and utilize an aid distribution formula that is based on actual cost of doing business and local capacity to pay.

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Executive Summary

Introduction

Recent changes in the Nebraska school finance system have taken place in the midst of considerable debate about the issues of cost efficiency, tax equity and quality of education. School size plays prominently in these debates. It is widely believed that smaller schools are "inefficient" because they tend to have above average costs per pupil. Current school finance policy rests on the premise that higher costs due to small size should not be subsidized by state funds unless there is no consolidation alternative. As a result, taxpayers in small school districts may be faced with a decision to override the school levy limits, or jeopardize school quality by severely cutting expenditures, or look for a consolidation option.

The purpose of this report is to re-frame the school size debate by demonstrating the excellent performance of Nebraska's small schools in two fundamental areas of student outcome: high school completion and postsecondary enrollment rates, and by offering an alternative measure of cost efficiency that includes student outcomes. These outcome measures are calculated as annual averages based on data for 1991-92 through 1994-95 from the National Center for Education Statistics, Common Core of Data and the Nebraska Department of Education, and for 1990 to 1998 data from the Nebraska Coordinating Commission for Postsecondary Education.

Findings

High school completion and postsecondary enrollment rates increase as school size decreases.

- The proportion of Nebraska students who graduate from high school without dropping out averages 97 percent in districts with less than 100 high school students, compared to the statewide average of 85 percent.
- High school completion rates are lowest for school districts with 600 - 999 high school students, averaging 80 percent.
- Nebraska postsecondary institution enrollment rates are 73 percent for counties that average less than 70 high school students per district, compared to 64 percent for counties that average 600 to 999 high school students per district.
- The percent of students who complete high school and enroll in a Nebraska college is 25 percent higher for counties with the smallest schools compared to those with the largest schools.

Annual cost differences between the smallest schools and the most "efficient" size school are cut in half when measured as cost per graduate rather than as the traditional cost per pupil.

- Nebraska schools with less than 70 high school students average only 25 percent higher cost-per-graduate amounts than those with 600-999 students, compared to 50 percent higher on cost-per-pupil measures.

Any higher school finance costs associated with small schools virtually disappear when the substantial social costs of non-graduates and the positive societal impact of college educated citizens are considered.

Compared to high school graduates without any college education, high school dropouts:
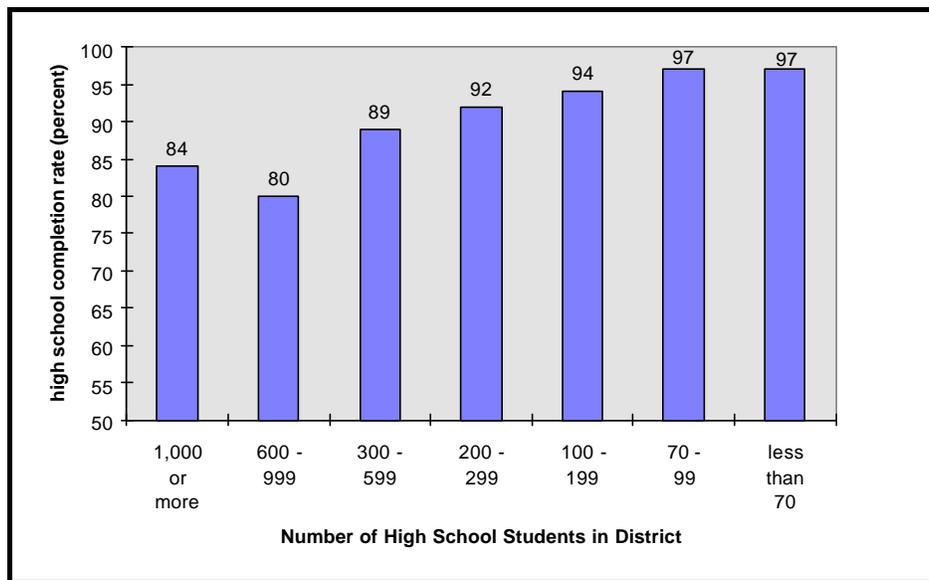
- are one third less likely to be in the labor force and are 3 times as likely to be unemployed.
- average only 62 percent of annual income.
- are 2.5 times as likely to receive some form of means-tested public assistance.
- are 3.6 times as likely to be in state prison.

Conclusions

This analysis shows that by two important measures of student outcome, smaller schools in Nebraska generally perform better than larger ones. The additional input costs of supporting students in smaller schools needs to be weighed against their more positive educational outcomes. The so-called "inefficiencies" of small schools are greatly reduced when calculated on the basis of cost-per-graduate, and virtually disappear when the substantial social costs of non-graduates and the positive societal impact of college-educated citizens are considered. However, these positive outcomes precede the LB 806 school finance legislation that excluded school size as a factor in the state aid distribution formula.

Currently, the state aid to education distribution formula penalizes most small schools for any above average per pupil costs, placing their excellent quality in jeopardy. A more equitable approach would be to reinstate a system of cost groups based on size. It is essential that we not discriminate against small schools when the student outcomes for most of these schools are so positive. The state aid formula should offer incentives for schools to maintain a high quality education at a fair cost to the public, rather than penalize small, high quality schools for any higher per pupil costs.

Figure 1. High School Completion Rates by School Size

Introduction

Recent changes in the Nebraska school finance system have taken place in the midst of considerable debate about the issues of cost efficiency, tax equity, and quality of education. School size plays prominently in these debates. It is widely believed that because smaller schools tend to cost more per pupil than larger schools they are less "efficient." The current state aid to education distribution formula accepts higher costs as necessary only when the school district meets certain predefined criteria of "sparseness."

Small schools in the "standard" geographic classification often incur higher costs for essential educational programs than larger schools, but they are expected to pay for the additional costs locally. This can place a heavy burden on school districts whose residents are limited in their income capacity to pay the property taxes that are levied. Local taxpayers may be faced with a decision to override the school levy limits or jeopardize school quality by severely cutting expenditures. State policy on school finance has put many small school districts between a rock and a hard place. It then offers consolidation as the solution and offers financial bonuses as a further incentive.

This school finance policy rests on the premise that small size is inefficient and should not be subsidized unless there is no alternative due to the sparseness of the area. Less often expressed is the assumption that small schools are inferior in terms of the diversity of courses and activities offered. Consequently, consolidation is viewed as an option that will save taxpayers money and improve educational quality.

The purpose of this report is to re-frame the school size debate by demonstrating the excellent performance of Nebraska's small schools in two fundamental areas of student outcome – high school completion and postsecondary enrollment rates – and by offering an alternative measure of cost efficiency. Previous research on the relationship between school size and school costs generally has focused on the input side of the equation and only occasionally has considered outputs, or what educators commonly refer to as outcomes.

School size and expenditures are used to calculate the popular and convenient "cost-per-pupil" amount as a measure of efficiency. This interpretation of "efficiency" is based solely on an economies-of-scale model, and ignores the need to consider school costs in conjunction with how well students perform (Stiefel, et al. 1998). A true measure of "efficiency" demands a review of school costs based on outcomes and not just on the number of students enrolled.

Among the various student outcome measures that could be considered, the high school completion rate is one of the most important and one that is readily available for all Nebraska school districts. This study, therefore, used high school completion rates to calculate cost-per-graduate as a measure of school cost efficiency. School districts are compared on these outcome and efficiency measures on the basis of size. There are seven size categories based on the number of high school students enrolled in the Fall of 1994, on a continuum from smallest (less than 70) to largest (1,000 or more).

The excellent outcomes for small schools presented in this report are measured for the years 1991-92 through 1994-95. This is a period that preceded the school finance changes of LB 806, implemented in 1998-99, which excluded school size as a factor in determining average costs for the distribution of state aid. As a result of these changes, current state aid policies place the high quality of small schools in jeopardy. The results of this study provide a compelling reason why Nebraska state policy should adequately support small schools and find ways to help larger schools improve outcomes through innovations that incorporate some of the beneficial attributes of smaller schools.

High School Completion Rates

School district dropout rates for grades 7 through 12 and diploma graduation rates for 12th graders provide a readily accessible measure of an important student outcome – staying in school and earning a diploma. The National Center for Education Statistics (NCES, 1998) provides these data for public school districts for school years 1991-92 through 1994-95. Every school district annually reports the information that NCES uses to calculate the dropout rates for each grade. This study used these rates to calculate a high school completion rate for each Nebraska K-12 and Class 6 public school district. The rate represents the percent probability that a student completing 6th grade will complete grades 7 through 12 without dropping out and will receive a high school diploma. The first step in calculating the high school completion rate was to calculate grade specific completion rates at each level, grade 7 through grade 12, in each of the four years by subtracting the dropout percentage for a grade level from 100 percent. For each year of data, the grade specific completion rates for grades 7 through 12 were multiplied together to produce the non-dropout rate, a measure of the likelihood that a student will complete grades 7 through 12 without dropping out at any time.

A diploma rate was then calculated for each year as the percent of those students completing 12th grade who graduated with a regular or alternative diploma, as opposed to a certificate of completion or other non-diploma outcome. This diploma rate was multiplied by the non-dropout rate to produce the high school completion rate based on one year of dropout and diploma rate data. These rates then were averaged for four years (1991-92 through 1994-95) to produce the school district high school completion rate used in this report.

The overall probability that a Nebraska public school student who completes 6th grade will not drop out of school and will graduate with a diploma is 85 percent. This probability increases as school district size decreases. Table 1 shows the median completion rates for school districts based on the number of high school students in the district. High school completion rates are highest for the smallest schools. Districts with 600 -999 high school students have the lowest rates at 80 percent, and those with fewer than 100 have the highest rates at 97 percent.

Table 1. Median Average High School Completion Rates and Annual Cost Per Pupil Likely to Graduate by School District, High School Size, Nebraska 1991-92 to 1994-95

High School Students in District	Number of K-12 School Districts	High School Completion Rate	Annual Total Expenditure Per Pupil	Annual Expenditure Per Pupil Likely to Graduate
1000 and over	12	84%	$5,306	$6,397
600 - 999	10	80%	$4,907	$6,093
300 - 599	19	89%	$5,266	$5,790
200 - 299	25	92%	$5,648	$6,252
100 - 199	76	94%	$5,709	$6,101
70 - 99	63	97%	$6,361	$6,734
below 70	63	97%	$7,417	$7,616

Cost-Per-Graduate

High school completion rates not only measure outcome quality but also have economic implications. Students who fail to graduate from high school do not represent the outcome for which the public has paid. Traditional cost-per-pupil measures are false indicators of efficiency that fail to account for differences among schools in the probability that students will complete school and receive a diploma without dropping out.

This analysis has taken each district's average annual total expenditure per pupil for the school years 1991-92 though 1994-95 (NCES, 1998) and divided it by its average high school completion rate to obtain an estimated cost-per-graduate measure (expenditure per pupil likely to graduate). Because the expenditure measures pertain to all grade levels in the district and costs are generally higher for high school students, this analysis was conducted only for K-12 districts. The median cost-per-pupil and cost-per-graduate measures are presented in Table 1 by school district size.

The findings show that school size differences in cost are greatly lessened by shifting from a cost-per-pupil to a cost-per-graduate measure. This shift increases the average cost by only 3 percent for the smallest school districts, compared to more than 20 percent for the largest districts. Whereas districts with less than 70 high school students have per pupil costs that are 51 percent higher than districts with 600 to 999 students, this difference is cut in half to 25 percent on the cost-per-graduate measure.

Costs of Non-Graduates

The negative impact of high school dropouts goes well beyond school cost "inefficiencies" that result from schooling children who do not graduate. Failing to graduate from high school is associated with a number of other social and economic costs. These costs include, among others, lower rates of labor force participation and employment, lower wages, increased need for public assistance, and a greater likelihood of incarceration compared to those who receive a high school diploma.

Employment and Earnings

An analysis of U.S. Bureau of Labor Statistics data for Nebraska for 1994-96 shows the employment disadvantage for high school dropouts as compared to high school graduates who have not attended college (Bernstein, 1997). Among non-college-educated Nebraskans age 16 and older, those without a high school diploma or equivalent are 32 percent less likely than graduates to be in the labor force (49 percent vs. 72 percent). Of those in the labor force, dropouts are nearly three times as likely to be unemployed (7.2 percent vs. 2.5 percent), and twice as likely to be underemployed (13.7 percent vs. 6.4 percent).

Nebraska high school dropouts who are employed full-time, year-round still earn, on average, 86 percent of what a high school graduate with no college earns (IWPR, 1998). However, since dropouts are much less likely than graduates to be in the labor force and working full-time, year-round, the average earnings differential is much greater. Nationally, the 1994 median income of dropouts was only 62 percent of those with a high school diploma and no college. (U.S. Bureau of the Census, 1996a).   The earnings gap for dropouts widens further in comparison to those with some college, no degree (50 percent), an associate degree (43 percent) or a bachelor degree or more (29 percent).

Although there are many economically self-sufficient Nebraskans who do not have a high school diploma, on average dropouts are employed less, earn lower wages, infuse fewer dollars in the Nebraska economy, pay less in taxes, and receive higher amounts of unemployment benefits than high school graduates.

Public Assistance

Less employment and lower earnings also result in greater use of public assistance programs for those without a high school diploma. A national report based on the Survey of Income and Program Participation (SIPP) (U.S. Bureau of the Census, 1996b) outlines levels of means-tested public assistance by educational attainment. These programs include Aid to Families with Dependent Children (AFDC), now Temporary Assistance for Needy Families (TANF), General Assistance, food stamps, Supplemental Security Income (SSI), Medicaid and housing assistance. On average, one in four high school dropouts (24 percent) received some form of means-tested public assistance during any month in 1993. By contrast, only 10 percent of persons with a high school diploma, no college and 4 percent of those with one or more years of college received public assistance.

The average monthly family benefit, excluding Medicaid and housing assistance, for dropouts was $380 in 1993. If Medicaid was included, the average monthly benefit would be much higher. Seventy percent of dropouts who participate in any means-tested program receive Medicaid benefits. In Nebraska, the average Medicaid benefit *per person* is $412 a month (Nebraska Health and Human Services, online data, July 1999). Average *family* benefits will be somewhat higher.

The 1990 Census indicates there were 206,482 Nebraskans (18 percent of the population 18 years and older) with less than a high school diploma or equivalent. If the national rates of public assistance participation and levels of benefit are applied here, then nearly 50,000 Nebraskans without high school degrees receive some form of public assistance each month. If high school dropouts had the same rate of public assistance participation as the rest of the population, there would be upwards of 35,000 fewer Nebraskans who receive assistance each month, at an annual savings of $130 million, with substantial, additional savings for Medicaid and housing assistance.

Criminal Justice

Although the vast majority of high school dropouts are law-abiding citizens, as a group they are more likely to be convicted of crimes than those with higher levels of educational attainment. Further, among those with criminal records, high school dropouts are more likely to have committed serious crimes and be incarcerated in state prisons, where the cost to society is the highest.

Nationally, high school dropouts comprise 46 percent of the local jail population and 65 percent of the state prison population, but only 25 percent of the U.S. population age 18 and older (U.S. Bureau of Justice Statistics, 1993, 1996; U.S. Census, 1990). Dropouts are 1.4 times as likely to be inmates in local jails and 3.6 times as likely to be in state prisons than high school graduates with no college. Compared to persons with at least some college education, dropouts are 10 times as likely to be in state prisons.

The Nebraska jail and prison population was 3,552 in June 1999 with a FY 1998 annual cost per inmate of $20,000 (Nebraska Department of Corrections, online data, July 1999). If the educational attainment profile among Nebraska inmates is similar to the national average, an estimated 1,634 inmates are high school dropouts, costing the state $33 million a year. If high school dropouts had the same incarceration rate as the rest of the population, there would be 1,017 fewer inmates in Nebraska correctional facilities, with an annual savings of $20 million a year.

Postsecondary Enrollment

Postsecondary education provides another measure of school outcome. As today's labor market increasingly calls for skilled workers, postsecondary education or vocational training becomes more essential for students as they complete high school. One component of an effective high school education is being prepared and motivated for higher education.

The Nebraska Coordinating Commission for Postsecondary Education provided data on the county of residence of in-state, first-time enrolled freshmen in Nebraska's public and private institutions of higher education (four-year colleges, universities, and community colleges) for five even-number years, 1990 through 1998. This report analyzed the data for all of the public institutions and for the private institutions with at least 100 Nebraska resident first-time enrolled freshmen. These data were used to estimate the annual average number of Nebraska postsecondary enrollments by county.

These enrollments include non-traditional first-time enrolled freshmen as well as those who graduated during the previous 12 months. The county of residence for freshmen who graduated high school in the past 12 months is the county of the high school. The residence of other first-time freshmen is the county of residence at the time of enrollment. An estimated one fourth of all first-time enrolled freshmen are not recent graduates. The enrollments do not include Nebraska high school graduates who enroll as first-time freshmen in out-of-state institutions, estimated to be 15 percent of all recent graduates enrolled in postsecondary institutions.

The Nebraska Department of Education provided the number of high school diploma graduates by school district (both public and private) for the school years 1992-93 through 1995-96. These data were used to calculate the annual average number of graduates per district. School district graduates were then aggregated by county. A postsecondary enrollment rate was calculated for each county as the annual average number of postsecondary enrollments divided by the annual average number of high school graduates.

County level high school completion rates also were calculated as the average high school completion rate for the public school districts in the county, weighted by the number of high school students in each district. The county high school completion rates and postsecondary enrollment rates were multiplied to produce an overall postsecondary opportunity rate. This rate estimates the likelihood that students in the county will complete high school without dropping out and enroll in a Nebraska institution of higher education.

Counties have been classified according to the weighted average number of high school students in the public school districts. The results are presented separately for Douglas and Lancaster counties because they have much larger school districts than other counties and are likely to have more non-traditional students enrolling in college who have migrated from other Nebraska counties or other states, thereby inflating their postsecondary enrollments.

Table 2 presents the median county high school completion, postsecondary enrollment and postsecondary opportunity rates by county school-size group. County high school completion rates increase as average high school size decreases, mirroring the completion rate pattern for school districts based on size as presented in Table 1.

Table 2. Median County Rates of High School Completion and Postsecondary Enrollment by Average Number of High School Students per District, Nebraska, 1990s

County/Average High School Students Per District	Number of Counties in Size Group	High School Completion Rate	Postsecondary Enrollment Rate for Grads	Overall Postsecondary Opportunity Rate
Douglas (7,940)	1	78%	70%	54%
Lancaster (7,422)	1	76%	86%	65%
Average H.S. size in county:				
600 - 1999	11	86%	64%	55%
300 - 599	12	90%	67%	60%
200 - 299	10	91%	66%	61%
100 - 199	32	94%	69%	63%
70 - 99	16	96%	68%	66%
less than 70	10	98%	73%	69%
Statewide Mean Average		**85%**	**70%**	**60%**

County postsecondary enrollment rates also increase as average high school size decreases, excluding Douglas and Lancaster counties. As noted earlier, the enrollment rates for these large metropolitan counties are likely to benefit from students migrating to these counties and working for a year or more prior to enrolling in college. The overall postsecondary opportunity rate also increases as county average high school size decreases. The likelihood that a student will complete high school and enroll in college is 25 percent higher for the counties with the smallest schools compared to counties with the largest schools.

These postsecondary enrollment results are especially impressive for the small school counties, given the fact that most of the graduates would have to leave home, or have a long commute to attend classes. Furthermore, the enrollment rates for small school counties are likely to be an underestimate because their high school graduates who wait more than a year before enrolling in college are likely to migrate to counties with larger populations for work and be counted as residents of those counties when they later enroll.

There are numerous public benefits from high rates of postsecondary education. As was noted in the section of this report on the costs of non-graduates, the earning power for workers with at least some college is substantially higher than for those who have only a high school education and much higher than for high school dropouts. Graduates with at least some college education are much less likely than others to receive public assistance or to be incarcerated for crimes. These higher earnings and lower demand on public services for graduates who receive a postsecondary education impact the economy and the public treasury in many ways that benefit all Nebraskans.

Summary and Conclusions

This analysis shows that by two measures of student outcome – high school completion and postsecondary enrollment rates – smaller schools in Nebraska performed better on average than larger ones in the years preceding LB 806. The excellent outcomes for many small schools are being jeopardized by the under-funding that has resulted from the LB 806 change in school finance policy that excluded school size from the state aid distribution formula.

The benefits of a small school education accrue not only to the students but also to the community and the public at large. The additional input costs of supporting students in smaller schools needs to be weighed against the more positive educational outcomes for smaller schools. The so-called "inefficiencies" of small schools are greatly reduced when calculated on the basis of cost-per-graduate, and virtually disappear when the substantial social costs of non-graduates and the positive societal impact of college-educated citizens are considered.

This study has only looked at two school outcomes: high school completion and postsecondary enrollment. Other measures such as student achievement, percent of graduates who enter the Nebraska workforce, and the community contributions of graduates would also be worthy of consideration if the data were available.

In addition to student outcomes, schools could also be evaluated according to the impact they have on the community. We need to consider not only the cost of operating a small school in a community but also what the costs would be for both students and communities were the schools to close.

Currently, the state aid to education distribution formula penalizes most small schools for any above average per pupil costs. Many local districts are forced to choose between overriding the levy limits or severely cutting expenditures. Consolidation, as a cost-saving option, is nearly non-existent. The recent wave of school consolidations has left few feasible options. Furthermore, by increasing school size, consolidation runs the risk of less positive student outcomes.

A more equitable approach to maintaining school quality would be to reinstate a system of cost groups based on size. Also, student outcomes could be used as a basis for increased aid, e.g., an incentive to schools to maintain high school completion rates of 90 percent or more. Policy revisions could also help support large schools that strive to improve outcomes by reducing the size of classrooms and other innovations that would incorporate some of the beneficial attributes of smaller schools.

The state aid formula should offer incentives for schools to maintain a high quality education at a fair cost to the public, rather than penalize small, high quality schools for any higher per pupil costs. While it is important to keep down the costs for schools of any size, it is just as important to help all schools maintain the high quality most of them now exhibit. It is essential that we not discriminate against small schools in the distribution of state aid when the student outcomes for most of these schools are so positive.

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Notes:

High school completion rates represent the percent of students who will complete 7th through 12th grades without dropping out and receive a high school diploma. Cost-per-graduate rates have been calculated by dividing school district cost-per-pupil amounts by the high school completion rate. These measures are calculated as four year averages for 1991-92 through 1994-95, based on data from the National Center for Education Statistics, Common Core of Data.

Postsecondary education rates represent the percent of high school graduates who enroll in a Nebraska public or private institution of higher education. These rates are county specific and are calculated from data provided by the Nebraska Coordinating Commission for Postsecondary Education for the even years 1990 to 1998, and the Nebraska Department of Education for 1991-92 and 1994-95 school years.

School districts have been grouped into seven categories based on the number of high school students enrolled in the Fall of 1994, on a continuum from smallest (less than 70) to largest (1,000 or more). Counties are also classified into size groups based on the weighted average number of high school students across districts in the county.