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ABSTRACT

Despite all the rhetoric about the quality aspect of small schools, the discussion inevitably boils down to a consideration of cost. The issue of cost differentials associated with school size requires an examination of the cost implications of alternatives. There are definite economies of scale associated with size; however, there also appears to be a point at which costs begin to rise relative to increased size. Research on school size provides support for the conclusion that costs do not automatically increase as schools get smaller and decrease as they get larger. When the actual costs are examined, it is evident that most cost differentials associated with size are due to personnel costs reflected in both pupil-teacher ratio differences and administration time. One should not assume the inevitability of either short-term or long-term savings from either school closure or consolidation. It is perhaps too simplistic a question to ask if small schools cost more; the relationship between school cost and size is more complex than can be answered in a simple negative or affirmative response. The cost considerations of closure or consolidation or size in general appear far less in magnitude than those of the quality consideration of size. (11 references) (KM)

THE COST OF SMALL SCHOOLS

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There has been considerable interest in issues related to school size over the past few years. For some schools the issue has been one simply of their small size. For others the issue has been more of a problem of declining size (Marshall, 1985). During this period we have examined small schools, praised their strengths, decried their weaknesses and fought against their closure. However, one thing is evident in all discussions about small schools issues between parents, teachers, trustees and board administration. Despite all of the rhetoric about the quality aspects of small schools, the discussion inevitably boils down to a consideration of cost.

Three questions appear to predominate regarding the financial viability of the small school; (1) Do small schools cost more? (2) How much will be saved by closing the school? and, (3) Is the savings worth it? The purpose of the present paper is to try and answer these questions through a review of the current research and literature regarding school size and costs.

Cost Differentials and School Size

The first question requires an examination of the cost differentials associated with school size. However, the issue is more than simply an examination of the cost or savings associated with one school that may or may not be smaller, or more expensive, but requires an examination of the cost implication of alternatives. Board level administrators ask questions such as "What if we close one school and add students to another school?" or "What if we build a new school in another area?"

A 1984 study in Alberta (Alberta Department of Education, 1984) examined student achievement, cost, rural context and quality differences relative to small/rural schools in order to address the choice between small elementary school construction and school sonsolidation with student busing. In the cost area, the study found that in Alberta small schools adversely affect direct costs and the availability of instructional funding. The study showed that in 1981 small schools in Alberta had an average per pupil expenditure of 22 per cent more than larger schools. The study also showed, however, that increased instructional costs were offset to a certain degree by direct government grants and the lower cost of busing. The study generally supported the notion that although small schools cost more, the other alternatives involving consolidation and busing do not necessarily result in a more efficient (or more effective) service.

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In Ontario the Allen Report (Ontario Ministry of Education, 1983) examined the feasibility of small high schools in northern Ontario. The author pointed out that cost differentials between the northern rural and small high schools were largely due to a pupil teacher ratio difference of 13.5 for northern boards and 16.8 for the province. Also in Ontario, Ridout (Ridout, 1977) examined school size cost differentials as part of a large study on the implications of declining enrolment. Through a survey of over 200 schools in 24 boards, Ridout provided an examination of the relationship between per-pupil costs and school size on a number of categories. As can be seen from Figure 1, there are definite economies of scale associated with size. However, what is also evident from Figure 1 is that there appears to be a point at which costs begin to rise relative to increased size. From Ridouts's data, it would appear that the schools in the 400-499 size range are the most efficient and that schools in the 800+ range are as expensive as those in the 200-99 size range.

A further review of the American literature and research on school size provides support for the conclusion of the Ridout study that costs do not automatically increase as schools get smaller and decrease as they get larger. Riew (1986) examined data from 150 elementary and secondary schools in Maryland and concluded the following:

> At the secondary level, the greatest cost saving from scale economies, as measured by reduction in per pupil costs from marginal enrollment increases, occurs over the enrollment range of 600-800. By contrast, the corresponding range at the elementary level is 200-400. (pp. 11)

Fox (1981,285) reviewed a large number of studies which were "conceptually acceptable and which (used) the appropriate unit of analysis" and concluded that "per pupil costs appear to be characterized by a U-shaped cost curve". McKenzie (1983) also suggested that the U-shaped cost curve could be representative of the school size-cost relationship, suggesting that average per pupil costs decline up to a point as enrollment increases, reach a minimum, and then rise with further school enrollment size increases.

Finally, Hind (1979, 135) in a review of a number of statistical studies concerning determinants of unit costs in primary schools, supported the conclusion that:

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> "the relationship between average costs and school size is likely to be characterized by discontinuties in the falling costs range and again in the rising cost range. Between these falling costs and rising costs there is likely to be a fairly wide range in which average cost exhibits little variation as school size changes."

His research in Australia suggested, in fact, that there was little cost differential between schools in the 100 to 600 student range.

The existence of a U-shaped cost-size curve has some implications for Boards facing either school closure or declining enrolment situations.

Firstly, if a cost-size curve can be established for a particular school board or jurisdiction, then decision makers can examine the affects of increasing or decreasing the disperson of schools around the low point on the U-shaped cost curve. For instance, it a Board has two schools of 400 students that they are considering combining into one school of 800 students, a close examination of the particular U-curve for their context might point out whether or not this would be economical.

Secondly, from most studies in this area it appears generally true that small schools cost more. But this appears to be the case only if small is defined as a size on the increasing side of the U-shaped cost curve. That is, a decrease in school size from 800 to 600 students may represent a move to a 'smaller' school, but it may not result in a significant (if any) increase in per pupil cost.

Finally, when the actual costs in various categories are examined, it is evident that most cost differentials associated with size are due to personnel costs reflected in both Pupil Teacher Ratio differences and administration time. This becomes an important factor when the savings accrued to a school closure or consolidation are calculated.

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The Effects of Closure

Marshall (1985,11) examined the cost arguments put forward for the closure of a small elementary school in a semi-urban school division. The cost comparison is presented in Table 1. It can be seen that the bulk of the savings per year will accrue from the net reduction of two teachers with the Board. In all other areas the closure results in either minimum savings or, in fact, some increased costs. This savings occured in a situation where there would be little additional transportation costs due to closing.

Coleman and LaRocque (1984) examined the issue of school district consolidation and suggested that there were flaws in the assumption that consolidation of school districts would result in economics of scales. Although the issues are not exactly the same, their conclusions apply equally well to the consolidation of small schools. Through an examination of the summaries of school district budgets in British Columbia, they observed that as expected, the smaller operating districts had higher gross operating costs per pupil. However, further analysis of the data suggested to the researchers that:

> "(1) School district amalgamation to increase average size will not result in economics of scale and reduced costs per pupil, although they will conceal high costs.
>
> (2) Attempts to control district per pupil operating costs should focus on teacher salaries, and on the joint variables of mean school size and PTR.
>
> (3) Small school districts are faced with an unalterable variable, small and remote schools, which has a dramatic impact on their gross operating costs."
>
> (pg. 34)

Other studies of school closures and consolidation support the notion that one should not assume the inevitabilty of either short term or long term savings from either closure or consolidation. For instance Hirsch (Fox, 1981) studied six school district consolidations and found that the overall precentage of the budget that is allotted to administration did decrease with consolidation, but he also discovered that the actual dollar expenditure on administration increased. In addition, his study

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supported Marshall's (1985) observation that savings from consolidation or closure were only likely to occur through tne lowering of the district Pupil Teacher Ratio. Furthermore, Andrews (1983) found that anticipated savings may not ever materialize, or as Coleman (1985) suggested, may disappear into the system but not go away. Andrews surveyed school systems who had experienced school closures or consolidation and asked them if they had saved money from closure. Fifty percent of the respondents said there was no savings, 16.7% indicated that there were, in fact, increased costs, while 33.3% indicated that savings did accrue.

As suggested previously, it is perhaps too simplistic a question to simply ask if small schools cost more. The relationship between school cost and size is more complex than can be answered in a simple negative or affirmative response. Similarly, although one conclusion is that there is a school size under which costs per pupil increase, it is equally simplistic to suggest a direct link between saving money and closing a school at a size below the size for optimum economy. This is evident in both an analysis of where the savings accrue and how much the savings will be.

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Is the Saving Worth It?

In all of the literature and research examined on the cost issues of school size and school closure, authors were consistent in their concern that cost analysis alone should not determine the fate of a school through consolidation or closure. Although cost curves and closure case studies can provide some evidence as to what the expected cost/savings might be, both the cost curves and the scenarios will be very different depending upon the school operating district setting. Even once an accurate cost accounting is done taking into account local contextual variables, the question will still remain as to whether the savings (if there is one) resulting from closure or consolidation is worth it. This paper has not dealth with the quality dimensions of size. This author has argued eleswhere (Marshall, 1985) that small schools have special qualities that can't be measured through cost-benefit analysis.

To some small schools advocats perhaps the conclusion in this paper that small schools cost more is too sobering. The other side of the evidence, that larger is not always more economical, may be somewhat heartening. However, what in fact may be the case is that most cost arguments for or against closure or consolidation may be irrelevant. The observations generated from cost-size studies may help get at the real cost/savings figures for consolidation, but from this author's experience (and supported from the cost analysis research) issues other than money are not the most important considerations in closure or consolidation discussion. Those researchers who have examined the closure process strongly suggest that it is a political process (Wetherly, 1983; Burns, 1987). Consistent throughout the cost-analysis research is the conclusion that, yes, smaller schools may or may not be more expensive (depending upon their location on the U-shaped cost curve), but the issue should not be whether to close or consolidate, but how to find ways of both cutting costs and of providing the needed additional resources to offer strong programs (Coleman, 1984).

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Consequently, although the present paper has focussed on cost-size issues, this author urges readers to use cost analysis data to explore ways of providing a more sound resource base to their smaller school settings. The cost considerations of closure or consolidation or size in general appear for less magnitude than those of the quality consideration of size (Marshall, 1985).

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FIGURE I

RELATIONSHIP BETWEEN PER-PUPIL COSTS IN FIVE CATEGORIES AND SIZE OF SCHOOL BY CLASS INTERVALS OF 100 FTE PUPILS, FOR SCHOOLS HAVING FEWER THAN 10 PERCENT OF THEIR PUPILS IN SPECIAL-EDUCATION CLASSES

Size of School FTE Enrolment	Number of Schools	Cost Per Pupil of FTE Enrolment				
		Teaching Personnel	Other Personnel	Total Personnel	Non-Personnel	Total
0 - 99	25	$910	$273	$1,183	$144	$1,327
100 - 199	42	774	231	1,005	116	1,121
200 - 299	44	693	161	854	90	944
300 - 399	36	714	150	864	80	943
400 - 499	25	668	136	804	77	881
500 - 599	11	671	141	812	78	891
600 - 699	9	698	139	837	78	915
700 - 799	7	665	125	790	80	870
800 +	3	724	131	855	88	944
Mean		736	180	916	97	1,013
n = 202						

TABLE 1

COST COMPARISON OF 'X' SCHOOL AS IS AND WITH 'X' CLOSED AND STUDENTS SENT TO 'Y' SCHOOL

COST ITEM	'X' AS IS	WITH 'X' STUDENTS AT 'Y'	COST DIFFERENCE
(1) STAFFING			
Principal's allowance	$ 2,839	$ -	$ 2,839
2.9 teacher salaries	102,202	(1) 33,960	(1.9) 68,242
.5 para/1.clerk	5,540	-	5,540
.5 secretary	6,650	-	6,650
Substitutes	1,250		1,250
3% fringe benefits	3,554	1,019	2,535
	$ 112,035	$ 34,979	$ 87,056
(2) UTILITIES/ SERVICES Telephone, Postage, Hydro	6,559	22	6,537
(3) INSTRUCTIONAL SUPPLIES	4,381	4,381	(0)
(4) REPAIRS/ MAINTENANCE	9,839		9,839
(5) TRANSPORTATION	$ 14,630	16,130	(1,500)
(6) SMALL SCHOOLS GRANT	(4,500)		(4,500)
TOTAL OF (1) TO (5)	$ 142,944	$ 55,512	$ 97,432.

* Based upon actual school board data presented to community as fiscal rationale for school closure.