F I N A L R E P O R T

K-12 SCHOOL FINANCE SUBCOMMITTEE

January, 1983

The K-12 School Finance Subcommittee of the Senate and House Standing Committees on Education was established by the Legislative Council to study the school aid funding formula, to review a report prepared for the National Conference of State Legislatures by the Legislative Fiscal Bureau, and to review general concerns relating to education.

Members of the Subcommittee were:

Senator Arthur L. Gratias, Nora Springs
Representative Horace Daggett, Lenox
Senator Ted Anderson, Waterloo
Senator Joe Brown, Montezuma
Senator Clarence Carney, Sioux City
Senator John Jensen, Plainfield
Representative Janet Carl, Grinnell
Representative Dorothy F. Carpenter, West Des Moines
Representative Richard Groth, Albert City
Representative George R. Swearingen, Sigourney

The Subcommittee was authorized three meetings. The meetings were held September 2, November 18, and December 16. At the first meeting Senator Gratias and Representative Daggett were elected co-chairpersons.

Prior to the adjournment of the legislative session, the National Conference of State Legislatures and the National Institute for Education had approved a cost-sharing award of $8,000 to the Iowa General Assembly for a study entitled "Refinement of the Elementary and Secondary School Foundation Plan: A Proposal for Improving the Fiscal Equity and Adequacy of the Instructional Programs in Iowa Schools." The acceptance of the grant required a state cash match of $4,700, which was approved by the Legislative Council, and a state in-kind match of $23,300.

Ms. Virginia Sheffield of the Legislative Fiscal Bureau, now an employee of the Iowa State Commerce Commission, developed an econometric model of the Iowa school district as a firm in order to identify the relationship of the factors of production with the cost and scale of production.

One of the main purposes for the establishment of the Subcommittee was to monitor the progress and review the conclusions of the study. At the first meeting, Ms. Sheffield reviewed the background relating to the study and explained the economic theory that would be tested.

At the second meeting she presented a preliminary draft of a report of the study describing the linear regression analysis she used to determine the relationships between the cost per pupil and a district's enrollment calculated as the natural logarithm of headcount and the square of the natural logarithm of headcount. The results of the study support the theory of "U-shaped" cost curves. There is significant empirical evidence that costs per student in smaller schools are higher on the average than in larger schools, and the costs are higher on the average in the very large schools than in the medium-sized schools. A copy of a summary of the study results is attached to this report. Copies of the study are available from the Legislative Service Bureau.

At the third meeting the Subcommittee voted to accept the report of the study prepared by Ms. Virginia Sheffield and directed that the report be sent to the National Conference of State Legislatures and the National Institute for Education.

The Subcommittee also directed the Legislative Fiscal Bureau to continue data collection for the 1981-1982 school year and using that data, continue an analysis of the "U-shaped" curve concept of funding for elementary and secondary schools under the direction of the House and Senate Committees on Education.

At the first meeting, information about educational issues of concern to the Subcommittee was presented by representatives of the Department of Public Instruction. These include an update on the identification of children with learning disabilities resulting from rule changes in the definition, a status report on the implementation of the Federal Education of the Handicapped Act in Iowa which includes funding for preschool age handicapped children, changes in federal regulations relating to special education, costs of providing transportation for nonpublic school pupils, bilingual education requirements, and the schools' use of computers for instructional purposes.

The Department of Public Instruction presented information about several proposals that will be part of the Department's legislative program for 1983. These include a provision for the application of both positive and negative special education instructional program balances, costs of contracts for special education pupils receiving programs in out-of-state facilities, consolidation of some special education categories, initiation of appeal procedures by area education agencies, maximum age for a pupil to receive special education programs, providing a funding mechanism for programs for dropouts, and providing a procedure for electing a school board after a reorganization of the district. The Subcommittee received the proposals, but took no action on them.

Copies of the information and proposals presented by the Department of Public Instruction are on file in the Legislative Service Bureau.

SUMMARY

REFINEMENT OF THE ELEMENTARY AND SECONDARY SCHOOL FOUNDATION PLAN: A PROPOSAL FOR IMPROVING THE FISCAL EQUITY AND ADEQUACY OF THE INSTRUCTIONAL PROGRAM OF IOWA SCHOOLS

Partial Funding Provided by NCSL-NIE

The purpose of the study of Iowa school finance was to develop a better measure of per pupil district cost which could be used to achieve a more equitable distribution of state and local funds. The study applied the economic theory of the firm to the operation of the school district in order to derive cost functions. The long run average cost function derived is the normal "U" shaped curve, where per pupil costs in smaller districts are higher than costs in medium to large sized districts and per pupil costs in very large districts are greater than in medium to large sized districts. Or, restated, costs are first declining as size increases up to a certain point and then costs begin to increase as size increases further. The "U" shape is due to economies and diseconomies of scale.

The theoretical cost curve model was used to formulate statistical models which were tested through the analysis of empirical data. Data were collected from the Secretary's Annual Reports of 1979-1980 and 1980-1981, filed with the Department of Public Instruction (DPI) and from other data files of DPI, the Comptroller, and the Legislative Fiscal Bureau. The cost measures used were total per pupil expenditures from the general fund and total general fund expenditures divided into five accounting categories: instructional, administrative, instructional support, student services, and central support expenditures per pupil. The five cost measures were used to statistically estimate the cost function parameters both individually and jointly. The equations used

in the statistical regression analysis specified the cost components as functions of the natural logrithm of headcount and the square of the natural logrithm of headcount. This natural logrithm specification is a linear transformation of a curvilinear or "U" shaped relationship.

There was strong emperical evidence supporting the theory of "U" shaped long run average cost curves for the instructional and administrative cost components and for the overall average total cost measure. The analysis of the other three cost categories: instructional support, student services and central support, provided minimal evidence that the relationship of these costs and size followed the "U" shape. Perhaps the measures for these components are inadequate (e.g., too aggregate) or there are extenuating circumstances which affects estimating their relationship with size. Straight linear analysis of these three factors shows that almost all (99%) of the variance in their summed value can be explained by the total number of students. Thus the per pupil expenditure on the total of these items is almost the same from one district to the next.

The costs per pupil using the estimated "U" shaped functions were compared to per pupil current law formula funding (controlled budget) and to total district general fund revenue per pupil to determine what, if any, adjustments to funding are necessary to bring funding into line with what has been determined to be theoretically equitable. Clearly, if the relationship of size and costs per pupil is "U" shaped, then it follows that an equitable allocation of funds per pupil will also be "U" shaped. It also follows that if the allocation of funds under existing methods is not "U" shaped and some districts receive less funds per pupil than the estimated theory based level, then funding in such districts may be inadequate, at least in the relative sense.

The comparison of current formula funding and actual revenue with the estimated "U" curve showed very dramatically that there is no "U" relationship of formula funding or of revenue with size (headcount). The comparison also showed that the discrepancies between the estimated "U" shaped curve and the funds received per pupil (either as total general fund revenue or as formula dollars) were very slightly negatively related to size of school district. This finding would indicate that there has been little systemmatic over or under funding of specific sized school districts. The degree to which funding deviates from the "U" shaped curve is best explained by the combined effects of the use of weightings for declining enrollment and the level of the original district cost embedded in the formula.

The primary conclusion, therefore, is that if the Legislature desires to follow the economic concept of equity presented and supported in this study, adjustment in funding allocations methods must take place. The form of such adjustments can be varied to best meet particular existing and future conditions. Suggestions for adjustments would include hold-harmless with new funding dollars being based on the study theory or movement over time toward the curve by additional new support to those below the curve and reducing additional new support to those far above the curve.