DOCUMENT RESUME

ED 319 771 TM 014 971

AUTHOR Hough, David; And Others
TITLE Cost-Effects Analysis of Year-Round Education Programs.
PUB DATE Apr 90
NOTE 52p.; Paper presented at the Annual Meeting of the American Educational Research Association (Boston, MA, April 16-20, 1990).
PUB TYPE Reports - Evaluative/Feasibility (142) -- Speeches/Conference Papers (150) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Budgets; Capital Outlay (for Fixed Assets); Comparative Analysis; Computer Uses in Education; *Cost Effectiveness; Educational Finance; Elementary Secondary Education; Enrollment; Feasibility Studies; Mathematical Models; Operating Expenses; School Accounting; School Districts; *School District Spending; Spreadsheets; State Aid; *Year Round Schools
IDENTIFIERS *California

ABSTRACT

This feasibility study was designed to gather and analyze data to determine the potential cost-effectiveness of year-round education (YRE) compared to traditional-schedule education in California. An expanded version of the Stanford Research Institute's cost model was used to fit a broad conceptualization that enabled school districts with differing accounting systems to follow a methodologically sound approach to costing a YRE program. Worksheets based on the model were input into a computer as a series of electronic spreadsheets. Six school districts in southern California piloted the model. Results indicate that the model worked and was adaptable to school districts' differing accounting systems, but that differences across school policies demanded redefinition of the original assumptions of the model. Pilot data enabled researchers to validate the cost model and to derive a set of normative scenario assumptions. The model covered capital, operations, transition costs, special revenue, total costs and savings, student enrollment, and per pupil costs and savings. Pilot data indicate that the school district always saved money by converting to YRE, whereas the state and taxpayer could either realize savings or costs. The key component appears to be operating expenses. A 40-item list of references, and various worksheets are appended. (TJH)

Cost-Effects Analysis of Year-Round Education Programs

Presented To:

American Educational Research Association
Annual Meeting

April 20, 1990

Boston, Massachusetts

By

David Hough
Research Fellow
University of California, Riverside
California Educational Research Cooperative

Jane L. Zykowski
Associate Specialist, UCR
Manager, California Educational Research Cooperative

James Dick
Research Associate
California Educational Research Cooperative

Introduction

Faced with sudden growth in student populations and immediate social and political pressures to house and educate the influx, many public school districts throughout the United States have experimented with innovative ways of redesigning the school calendar. In California, student housing problems have never been more severe (see, for example, Honig, 1988), and recent legislation AB 1650 (Isenberg) mandates that school districts consider alternative methods of housing students, i.e., either to place a percentage of students on a series of multiple, staggered attendance schedules (known as year-round education [YRE]) or to conduct feasibility studies which explore the difference between a traditional student attendance schedule (i.e., the nine-month, September to June calendar) and a multiple, staggered attendance schedule (YRE). The primary focus of the YRE feasibility study is to calculate the fiscal impact of converting from a traditional school calendar (TSC) to a year-round calendar (YRC).

This study was designed to gather and analyze data that will help answer many of the questions inherent in the YRE debate and to identify the issues that must be addressed to formulate prudent policy. Although three critical areas of concern provide the rubrics u which the issues can be grouped (fiscal, educational, and social impacts), this paper examines only the **cost modeling** necessary to derive comparable data to answer a portion of the question, "Which calendar is more cost-effective--the multiple YRC or the single TSC?"

Methodology

A comprehensive literature review was completed (Hough, et al., 1990), summarizing the many perceptions held by proponents and opponents of year-round education. (Some information from that review is incorporated into this paper.) The review revealed that a cost-effects approach (Levin, 1983) could best address these issues and answer the questions by relating cost to outcome measures. Therefore, a cost model needed to be constructed to standardize accounting procedures so that accurate across-district comparisons could be made. This effort was completed in two phases. First, using a prototypical model developed by the Stanford Research Institute (Pevelin, 1979) and collaborating with two county offices in Riverside and San Bernardino and southern California school districts, the researchers expanded the SRI model to fit a broader conceptualization, enabling districts with differing accounting systems to follow a methodologically sound, step by step approach to costing a YRE program. The product of this resulted in a series of planning and cost work sheets and forms that reveal what districts spent on TSC and what they would have spent on a simulated YRC (Matthews, et al., 1989). These work sheets and cost forms can also be used by schools already on a YRC who wish to simulate a TSC.

The second phase of this part of the project was to computerize the work sheets and forms into a series of electronic spreadsheets, thus eliminating the many complicated mathematical computations. The electronic spreadsheets are used, here, to demonstrate both the cost model and examples of a few different scenarios produced when different policy decisions are made. Figures 1 through 6 represent the summary spreadsheets only; the entire set of spreadsheets used to assemble the summaries are presented in Appendix A.

The next step was to pilot the model. Six school districts in southern California contributed cost data that were entered into the model for analysis. Two things became clear: (1) the cost model worked and was adaptable to school districts' differing accounting systems, and (2) because school policies are as different as they are alike, the original set of assumptions driving the model needed to be redefined. Thus, a set of "normative" assumptions based on a common theoretical framework were developed.

Cost Effectiveness

A Theoretical Perspective

Some districts report cost savings while others report additional costs associated with the YRC. These differences depend on the types of expenditures included in cost computations, however -- not on differences in actual expenditure patterns. If YRSs are able to accommodate anywhere from 20% to 50% more students in the same space (Kilbert, 1988), then why is not a proportionately similar savings realized? To date, research has not identified empirical data to answer this question; however, several theories relating to the difficulty of determining the answer have been suggested.

Four factors confound YRE cost analysis. First, disagreements about the definition of relevant costs abound. Some schools report "avoided costs" (i.e., projected savings as a result of not spending money on other programs such as construction) to yield a savings, while other districts may or may not include start-up or implementation costs. And when implementation costs are included, some amortize them over, say, twenty years while others treat them as one-year lump sum expenditures. Second, districts do not all employ the same accounting system. Third, regulating legislation is not uniform among states, and incentive monies awarded to various programs, even within a given state, vary among districts. Fourth, school budgets and expenditures are income driven; schools spend what their sources of revenue allow them to spend. Income can vary greatly among districts; therefore, line item per pupil expenditures reflect more accurately (than generic total expenses) the "truth" regarding cost. Total cost is a misleading determinant; only per pupil expenditures allow for cross-district cost comparisons.

Three possible methods can be used to compare YRE costs to TSC costs: (1) comparison of the same school budget to prior years (e.g., Illinois State Office of Superintendent, 1972), (2) comparison of a YRE budget to that of a "matched school" operating on a traditional calendar (e.g., Knapp, et al., 1978), and (3) comparison of a YRE budget to a simulated one for the same school as if it had a TSC (e.g., Knapp, et al., 1976). The problem with using any of these methods is the reliance on accuracy of any given budget, i.e., assuming that a school spends what it initially plans and that the expenditures are made exactly as outlined. The pitfall to this approach is obvious and real.

Levin (1983) identifies five "inadequacies" of using budgets for accurate cost analysis:

> (1) Budgets often do not include cost information on all of ingredients that are used in the intervention, since contributed resources such as volunteers, donated equipment and services, and other "unpaid" inputs are not included in the budget.
>
> (2) When resources have already been paid for or are included in some other agency's budget, they will not be discernible.

(3) The standard budget practices may distort the true costs of an ingredient.

(4) The costs of any particular intervention are often embedded in a budget that covers a much larger unit of operation.

(5) Most budgetary documents represent plans for how resources will be allocated rather than a classification of expenditures after they have taken place. (pp. 50-51)[1]

Rather than using budget items, then, for cost analysis Levin suggests using the "ingredients method" which is more direct and accurate. The Ingredients method is predicated on the notion that each intervention has an identifiable value and corresponding expense. By identifying these ingredients and finding specific expenditures, the total amount for the intervention can be determined, "as well as the cost per unit of effectiveness, benefit, or utility" (Levin, 1983).

Levin (1988) draws the following distinctions among these three forms: "**Cost-effectiveness** assesses outcomes in educational terms (e.g., student achievement), **cost-benefit** assesses outcomes in terms of their monetary value, and **cost-utility** evaluates outcomes in terms of their subjective value to the decision-maker" (p. 52). Each form of analysis brings a unique orientation to the policy decision. Early forms of cost-benefit analysis were used by Weisbrod (1965) to evaluate how a reduction in dropouts related to worker earnings as discriminated by level and style of education. A similar study relating to vocational education was completed in 1971 by Hu, Lee, and Stromsdorfer. Gramlich (1981) documents the traditional use of cost-benefit analysis to ascertain the value of

[1]Some distinction should be made regarding "proposed" versus "actual" budgets. Levin refers to proposed budgets in his rendition; however, if actual budgets reflect those ingredients or line item expenditures that were actually spent, then these latter sources could be used in cost analyses and still maintain costing integrity.

public investments. Hawley, Fletcher, & Piele (1986) have developed a form of cost-utility analysis for education, and an additional form of analysis, known as **cost-feasibility** is treated by Levin (1983).

Cost-effectiveness[2] analyses have been used in education to evaluate educational television and radio (Jamison, Klees, & Wells, 1987), computer-assisted instruction (Hawley, Fletcher, & Piele, 1986; Levin, Glass, & Meister, 1984, 1987; Levin, Leitner, & Meister, 1986), teacher selection (Levin, 1970), and to class size reduction, longer school days, cross-age tutoring (Levin, Glass, & Meister, 1984, 1987). A recent cost-effects study was completed by Hecht (1989) to assess the California Regional Occupational Centers/Programs. In addition, Chambers (1981) and Hartman (1981) have incorporated cost-effects methods for state-level planning of diverse educational programs.

Using the ingredients method for cost-effects measurement yields a "straightforward approach to estimating costs that is comprehensible to evaluators and policy-makers while meeting rigorous standards of economics methodology" (Levin, 1988) Preliminary steps leading to a practical application of cost-effectiveness include the definition of an educational problem, development of criteria for assessment of possible solutions, and formulation of alternative interventions (Levin 1983, 1988). As a result, cost-effectiveness focuses on interventions rather than the more traditional concept of evaluation of costs. Levin (1988) defines the cost benefit approach as, "the value of the resources that are given up by society to effect the intervention. These are referred to as the

[2]While cost-effective is always used as an adjective, both cost-effects and cost-effectiveness are used interchangeably and as adjectives or nouns. All terms denote the ratio of cost to outcomes.

ingredients of the intervention, and it is the social value of these ingredients that constitute its overall cost" (p. 54).

Cost-Effects Analysis and YRE

By applying these principles (and their accompanying components) to YRE as a program intervention different from the TSC, policy-makers will be better able to address the issue of cost in relationship to the school program and expected outcomes. The most common approach is the use of academic achievement to derive a cost/effect ratio that might be expressed in terms of per pupil expenditure/achievement (Rossi, Freeman, & Wright, 1979). Guthrie (1985) conducted a cost-effectiveness analysis using Levin's 1983 model for the Houston Independent School District. An examination of the Year-round School Final Evaluation Report 1984-84 finds that these ratios allow for a total average cost-per-pupil figure or percent increase to be placed alongside educational outcomes, e.g., achievement, attendance, dropout rate. Avoided costs in the form of projected savings by implementing the YRS in lieu of building new schools was not used in the Houston model. The 1984-85 YRS program incurred a 35.7% increase in operating costs compared to an 8.5% increase for the TSC and showed 61.2% of students achieving at or above grade level compared to 56.8% for the TSC (Guthrie, 1985). The Houston model compared eleven YRSs to 112 TCSs and included intersessions which may account, in part, for the differences listed above.

Cost Ingredients

Chapman (1972) outlines expenses associated with preparing the community for YRE and for restructuring the curriculum. Waner (1975) addresses additional costs incurred in the areas of transportation, air conditioning, and teacher salaries.

Numerous "hidden costs" may be encountered in varying forms due to unique school designs, climates, and other factors.

The following are commonly identified as influencing the costs directly associated with YRE:

(1) calendar selection; hence, the percent of building capacity utilized, (2) degree of curriculum change, (3) voluntary or mandatory program, (4) size of the school, (5) class size, (6) transportation, (7) building modifications, (8) teacher and staff contracts, and (9) facility alterations such as air conditioning and portable storage cabinets.

The key issue regarding the ingredients method of costing a year-round program lies in the determination of what to include in the formula. Expenditures that impact the year-round program in a different manner from those related to a traditional prograr must be isolated. Causes of expenditure variances from one program to the next must be found. Levin (1983) lists five general areas to be studied when analyzing cost: (1) personnel--"all human resources required for each of the alternatives that will be evaluated"; (2) facilities--"physical space required for intervention"; (3) equipment and materials--"furnishings, instructional equipment, and materials that are used for the intervention"; (4) other program inputs--"all other ingredients that do not fit readily into the categories set above. For example, . . . extra library or theft insurance . . . cost of training sessions at a local college. . . "; (5) client inputs--"any contributions that are required of the clients or their families," as families may have "to provide transportation, books, uniforms, equipment, food, or other student services" (pp. 54-55).

The Educational Research Service, Inc. (1974) after evaluation of the YRE program at the Mills E. Godwin Middle School, Prince William County Public School District, Fairfax, Virginia, identified four broad areas for cost analysis: instructional staff, support staff, buildings, and equipment. This study listed specific line-item expenditures in dollars per pupil expenditure annually, finding a total savings of $109.46 per pupil, per annum, for a 45-15 plan when compared to costs that would have been incurred in a traditional school year for 1971-72 at the same school. This represented a 9.6% savings. Start-up costs were treated separately and not included in the general comparison identified here.

Perhaps in districts that implement YRE for curriculum reform such as in Atlanta, Georgia (Rifkin, 1973), extra costs are intentionally built into the program; whereas, in areas impacted with immediate overcrowding, district monies are allocated differently -- making the program less costly. As a result, more schools are interested in sheer <u>cost</u> rather than <u>cost</u> <u>outcomes</u>, or **effects**. In the case of Houston, Texas, (Guthrie, 1985) -- where money flowed freely for a while and then an economic recession occurred -- perhaps the immediate gains of abandoning a YRC and reverting to a TSC outweighed the long-term fiscal benefits that might have been realized. Also, certain policy decisions such as offering intersession courses and acquring temporary portable classrooms, instead of constructing year-round facilities, could have impacted cost.

In short, the ingredients used in any model influence the reported cost or savings. While some districts report increased costs, others report savings on the YRC. Lack of agreement regarding the correct ingredients account for must of the discrepancy.

The Cost Model

Several conceptual ideas must be addressed to construct a YRE cost model. First, assumptions regarding the generic nature of the model must be made, for these are the underpinnings. Second, a theoretical perspective must be taken regarding the validity of a given costing approach. Third, the ingredients of the cost model must be identified and incorporated to insure that all related factors are accounted for.

<u>Basic Assumptions of the Cost Model</u>

(1) **SIMULATED APPROACH**: The best way to analyze the cost impact of a schedule change at a school is to compare the actual operation under one schedule with what it would have cost to operate the same school (and program) under the alternative schedule. Foremost among the advantages of this procedure is the fact that it allows us to hold the **educational process constant**. Differences in costs do not have to be adjusted for changes in program.

(2) **EDUCATIONAL PROGRAM HELD CONSTANT**: The model must make clear the consequences of policy changes. Often when an organization change is implemented, other changes are instituted and implemented simultaneously. When this happens, an equitable comparison can only be made by holding the ancillary changes constant. Therefore, the cost model must be able to identify policy changes that are not calendar related or that are not directly a function of the school program, per se. In this way, an assumption can be made that schools are providing the same programs and services, although the delivery of these may differ.

(3) **SCHOOL SITE OR DISTRICT UNIT OF ANALYSIS**: Either the school site or the entire school district can be used as a unit of analysis. Although most school decision makers are primarily interested in the fiscal impact at the district level and although most school accounting systems are set-up to aggregate to district totals (rather than disaggregate to school sites), costs can also be assigned directly to each school site. So-called "hidden costs" and "opportunity costs" can then be identified and attributed to specific ingredients in the model. In fact, by using both school site and district level comparisons, discrepancies regarding the distribution of cost can be identified if these actually exist.

(4) **SAME ADA REGARDLESS OF CALENDAR**: The comparison must assume that the same number of students are receiving the same

instructional services. Holding enrollment constant has the same effect as presenting costs on a per-student, or per ADA, basis. However, this technique avoids contamination by cost components that have a nonlinear relationship to student population (e.g., administrative costs that change as a step function).

Using these assumptions the following cost components for an over-simplified model:

CAPITAL + OPERATIONS + TRANSITION + SPECIAL REVENUE =

TOTAL COST/SAVINGS ÷ STUDENT ENROLLMENT =

PER PUPIL COST/SAVINGS[3]

A similar incremental cost model approach is explained in detail in *A Study of Year-round Schools*, Volumes II & III (SRI, 1978). However, the CERC cost model imposes a total cost approach which has a unique advantage: "hidden" and "opportunity" costs can be identified because no component or factor influencing cost is omitted; whereas, in the incremental approach, components impacting costs must be identified before they become a part of the model.

Previous YRE cost studies suggest that at least six expenditure areas are affected: classroom construction, teachers and staff, transportation, maintenance, utilities, and incentive revenues. Other factors such as dropout rates, student and teacher attendance, and curricular decision may also affect cost, however. Therefore, the total cost approach is necessary to uncover less obvious impacts.

The following formulas show how the structural model is manipulated by addition, subtraction, and/or omission to produce a gross cost figure before being

[3]See Appendix A for the complete set of ingredients itemized under each component of the model.

divided by school enrollment to yield a per pupil cost/savings figure.

In general, three sets of TSC and YRC formulas produce three different views regarding cost. Although these differences are discussed in detail in the final section of this paper, the formulas are given, here, as follows:

(1) To Derive School Site and/or District Level Comparisons,

$$(CC1,2 + TOC = TSC\ c \div En = TSC\ PP\ c) - (YOC1,2 + TC - SR = YRC\ c \div En = YRC\ PP\ c) = YRC\ PP\ c/s\ [c\ \text{difference between TSC \& YRC}]$$

(2) To Derive State Comparisons,

$$(CC3 + [TOC \times .70] = TSC\ c \div En = TSC\ PP\ c) - (YOC3 + [TC \times .70] + SR = YRC\ c \div En = YRC\ PP\ c) = YRC\ PP\ c/s$$

(3) To Derive Total Taxpayer Comparisons,

$$(CC1,2,3 + TOC = TSC\ c \div En = TSC\ PP\ c) - (YOC + TC + SR = YRC\ c \div En = YRC\ PP\ c) = YRC\ PP\ c/s$$

Where
CC1 = Capital Costs from the district general fund; CC2 = Capital Costs from other district funds; CC3 = Capital Costs from state sources; TOC = Traditional Calendar School Operating Costs; YOC = Year-round calendar Operating Costs; TSC = Traditional Calendar School; c = cost; En = Enrollment; PP = Per Pupil; YRC = Year-Round Calendar; TC = Transition Costs; SR = Special Revenue incentives. (.70 is the percent of state revenue funding to districts)

The "Normative Scenario"

After having formulated a "total" cost model that includes all possible ingredients, data from the six pilot school districts were entered and analyzed. Because of the myriad differences in programs and policies, it became apparent that a conceptual beginning point (or benchmark) from which variances could be compared was needed. To develop a benchmark that would reflect reality as closely as possible, a normative scenario was created. Following are the assumptions that were made using current California fiscal policy practices:

(1) Base Year Comparison **(20-Year Picture)**

A single year (snap shot) of any given school district's fiscal picture might be grossly misleading. For example, if a district is not involved in a building program during the year the cost analysis is being conducted, capital costs may not be included into the formula. However, if this same district were to cost a program, say the following year, when it is heavily involved in a building program, a tremendous amount of capital would be included in the formula, producing a totally different scenario. Such an analysis would be spurious. Therefore, we assumed that a 20-year projection would better identify "true" capital expenditures. In addition, because amortization of capital and transition costs assumed a 20-year life-span, it followed that a 20-year picture would be a "standard base" to which other elastic time frames could be compared, 10-year, 30-year, etc.

To address the issue of longevity relative to capital costs, it was assumed that the cost of a classroom would remain constant and that a building "core" (i.e., costs associated with hallways, bathrooms, libraries, auditoriums, et cetera) could be assigned a cost and that this "core cost" could be evenly distributed among all classrooms. Because the number of classrooms needed is directly proportional to the number of students enrolled, classroom space necessarily increases and decreases without changing the core cost. Also, there is a point when no more classrooms can be added to a site until additional core costs are incurred, i.e., more bathrooms, larger lunch room, etc.). This assumption allowed us to standardize the problematic issue of capital costs avoided when the YRC was to be implemented.

(2) Percent Capacity or Building Load **(100% Constant Building Capacity)**

Because per pupil cost comparisons are made, the percent of building utilization is critical. If a building is operating at 85% capacity, costs are ascribed to each student at a higher rate than if the building were operating at, say, 110% capacity. Such "economies of scale" had to be equalized to insure that the same percent of capacity was being applied to the simulated model.

It was assumed, then, that over the long term (mediated by anomalies of over and under capacity) 100% utilization would be achieved. However accurate or inaccurate this assumption may be for any given district, it allowed us to posit alternative trends regarding student population increases and decreases and space over-/under utilization scenarios.

(3) Calendar Selection **(Calendar = Sole Independent Variable)**

The many operative YRCs produce either a 25%, 33%, or 50% increase in building capacity over the TSC. Accompanying these increases, however, are some considerations regarding teacher work load, instructional supplies, transportation, utilities, and building maintenance--all ingredients found to have an impact on the cost and educational benefit derived at a school facility.

Although a host of educational issues surround the calendar selection process, most can be grouped into two categories: (1) teacher work load and (2) length of vacation periods. Assuming 100% utilization of space on any of the three basic YRCs, can teachers be expected to work 25%, 33%, or 50% harder? Although the statistical data from this study have yet to be gathered to answer this question, if the answer is "yes," then extended contracts can be offered and a savings in benefit costs may be realized. If the answer is "no," then additional teachers will have to be hired to maintain appropriate class sizes. Are shorter vacations desirable (educationally and/or socially/psychologically)? If the answer is "yes," then a calendar with a series of two-, three-, or four-week breaks may be preferable over longer periods similar to the traditional ten-week summer vacation. Schools are finding that there is a relationship between the number of teachers that must "rotate" between classrooms and the number of "start-up" times and attendance schedules incorporated into the YRC and that these impact cost. (For example, portable storage cabinets are needed to hold instruction supplies for each teacher.)

(4) Local Decisions **(Policies Change, Programs Do Not)**

An underlying assumption of the cost model is that a simulated approach is required to hold the school program constant. That is, such things as student-to-teacher ratios, classroom costs, curricular offerings, special services, et cetera can not change if accurate comparisons are to be made. However, the delivery of those programs may very well necessitate changes in policy. Maintaining the same student-to-teacher ratio, for example, does not dictate how a district may choose to effect it--whether by hiring additional personnel or by extending contracts, for example. A school that offers a class in computer science on a TSC will have to offer the same class on the YRC, albeit, perhaps not on all attendance schedules. In the area of instructional supplies: Each child in attendance who has a text book on a TSC must have a text book on the YRC; however, because a group of students is always "on vacation" at some point on the YRC, the school has an option of buying text books on a per student or per desk basis. These confounding situations require prior planning and policy modifications when making the transition from one organizational system to another. Whatever decisions are made must be identified to (1) insure that school programs have not been changed and (2) determine if a cost is associated with the policy change necessary to accommodate a given calendar plan while maintaining the integrity of the school program.

Combining the set of cost model assumptions with the scenario assumptions produces the following:

"Normative Scenario"

Cost Model Assumptions	+	Scenario Assumptions
Simulated Approach		20-Year Picture
Ed. Program Constant		100% Constant Bldg. Capacity
School or District Analysis		Calendar = Sole Independent Variable
ADA Held Constant		Policies Change, Programs Do Not

Scenario 1: Normative

Figure 1 is the Normative Scenario summary work sheet produced from the electronic spreadsheet. All data in this conceptual presentation are hypothetical, based from averages produced by pilot schools and districts. Using a district level approach, the normative scenario is formed by supplying background information, calculating TCS variables, making policy decisions, and calculating YRS variables.

Background information supplied by the districts includes the total school enrollment, pupil-teacher ratio, and the number of permanent and portable classrooms currently operated by the district. The annual cost of a classroom, ($22,000.00), portables ($8,500.00), and per pupil operating expenditures ($2,400.00) are all 20-year averages which can be increased or decreased in subsequent analyses.

AERA @ Boston, Mass.
April 20, 1990

Figure 1.

CERC COST MODEL SUMMARY WORKSHEET Scenario 1 XYZ DISTRICT NORMATIVE

Background Variables		Calculated TCS Vars		Decisions		Calculated YRS Vars	
Total School Enrollment:	1094			Calendar:	45/15	Calendar Code:	1
Pupil Teacher Ratio:	30	TCS Teachers	36	% Tch ExtCont:	0%	YRS Teachers:	36
Permanent Classrooms:	25	Classrooms:	36	% student YRS:	100%	Classrooms:	27
Annual Cost per Room:	22,000	Utilization:	101%	p/p Ann Trans:	$25	Utilization:	100%
Portable Classrooms:	11	Annual Capital	550,000	p/p Rev Incen:	$110	Annual Capital:	550,000
Annual Rental Cost:	8,500	Rental Cost:	93,500	% Captl/State:	50%	Rental Cost:	19,975
Per Pupil Operating Exp TCS:	2,400			% diff Op Exp:	100%		

Summary of Costs	District General Fund	Other District	District Total	State Funds	Taxpayer Total	Total Per Pupil Expenditures: YRS Total	Percent YRS	TCS Total	Percent TSC	% Diff.
Annual Capital Costs										
TCS Annualized Capital Costs	275,000	0	275,000	275,000	550,000			503	17%	
TCS Rental of Portables	93,500	0	93,500	0	93,500			85	3%	
Sub-total for TCS	368,500	0	368,500	275,000	643,500			588	20%	
YRS Annualized Capital Costs	275,000	0	275,000	275,000	550,000	503	16%			
YRS Rental of Portables	19,975	0	19,975	0	19,975	18	1%			
Sub-total for YRS	294,975	0	294,975	275,000	569,975	521	17%			
YRS (cost)/savings	73,525	0	73,525	0	73,525	67				-99%
Annual Operating Costs										
TCS	2,625,600		2,625,600	1,837,920	2,625,600			2,400	80%	
YRS	2,625,600		2,625,600	1,837,920	2,625,600	2,400	79%			
YRS (cost)/savings	0		0	0	0	0				0%
Annualized Transition Costs										
Total	27,350		27,350	19,145	27,350	25	1%		1%	-37%
Special YRS Incentive Revenues										
Total	120,340		120,340	120,340	120,340	110	4%		4%	
COMPARISONS										
TCS Costs	2,994,100		2,994,100	2,112,920	3,269,100	2,988				
YRS Costs	2,827,585		2,827,585	2,252,405	3,343,265	3,056				
YRS (cost)/savings	166,515		166,515	(139,485)	(74,165)	(68)				
Per Pupil (cost)/savings	$152.21		$152.21	($127.50)	($67.79)					
Percent (cost)/savings	5.56%		5.56%	-6.19%	-2.22%					
			Savings to District	Cost to State	Cost to Public					

Enrollment: YRS	TSC	
1094	0	100%
Total	1094	

17

Hough, D., Zykowski, J. & Dick, J.
CERC @ UCR

CERC COST MODEL SUMMARY WORKSHEET   Scenario 2   XYZ DISTRICT   EXTENDED CONTRACTS

Background Variables		Calculated TCS Vars		Decisions		Calculated YRS Vars	
Total School Enrollment:	1094			Calendar:	45/15	Calendar Code:	1
Pupil Teacher Ratio:	30	TCS Teachers	36	% Tch ExtCont:	100%	YRS Teachers:	27
Permanent Classrooms:	25	Classrooms:	36	% student YRS:	100%	Classrooms:	27
Annual Cost per Room:	22,000	Utilization:	101%	p/p Ann Trans:	$25	Utilization:	100%
Portable Classrooms:	11	Annual Capital	550,000	p/p Rev Incen:	$110	Annual Capital:	550,000
Annual Rental Cost:	8,500	Rental Cost:	93,500	% Captl/State:	50%	Rental Cost:	19,975
Per Pupil Operating Exp TCS:	2,400			% diff Op Exp:	91%		

Summary of Costs	District General Fund	Other District	District Total	State Funds	Taxpayer Total	Total Per Pupil Expenditures: YRS Total	Percent YRS	TCS Total	Percent TSC	% Diff.
Annual Capital Costs										
TCS Annualized Capital Costs	275,000	0	275,000	275,000	550,000			503	17%	
TCS Rental of Portables	93,500	0	93,500	0	93,500			85	3%	
Sub-total for TCS	368,500	0	368,500	275,000	643,500			588	20%	
YRS Annualized Capital Costs	275,000	0	275,000	275,000	550,000	503	18%			
YRS Rental of Portables	19,975	0	19,975	0	19,975	18	1%			
Sub-total for YRS	294,975	0	294,975	275,000	569,975	521	18%			
YRS (cost)/savings	73,525	0	73,525	0	73,525	67				45%
Annual Operating Costs										
TCS	2,625,600		2,625,600	1,837,920	2,625,600			2,400	80%	
YRS	2,389,296		2,389,296	1,672,507	2,389,296	2,184	77%			
YRS (cost)/savings	236,304		236,304	165,413	236,304	216				146%
Annualized Transition Costs										
Total	27,350		27,350	19,145	27,350	25	1%		1%	17%
Special YRS Incentive Revenues										
Total	120,340		120,340	120,340	120,340	110	4%		4%	
COMPARISONS										
TCS Costs	2,994,100		2,994,100	2,112,920	3,269,100	2,988				
YRS Costs	2,591,281		2,591,281	2,086,992	3,106,961	2,840				
YRS (cost)/savings	402,819		402,819	25,928	162,139	148				
Per Pupil (cost)/savings	$368.21		$368.21	$23.70	$148.21					
Percent (cost)/savings	13.45%		13.45%	1.23%	4.96%					
			Savings to District	Savings to State	Savings to Public					

Enrollment: YRS	TSC	
1094	0	100%
Total	1094	

Figure 2.

Hough, D., Zykowski, J., & Dick, J.
CERC @ UCR

AERA @ Boston, Mass.
April 20, 1990

CERC COST MODEL SUMMARY WORKSHEET   Scenario 3   XYZ DISTRICT   NUMBER STUDENTS ON YRC

Background Variables		Calculated TCS Vars		Decisions		Calculated YRS Vars	
Total School Enrollment:	1094			Calendar:	45/15	Calendar Code:	1
Pupil Teacher Ratio:	30	TCS Teachers	36	% Tch ExtCont:	0%	YRS Teachers:	36
Permanent Classrooms:	25	Classrooms:	36	% student YRS:	25%	Classrooms:	34
Annual Cost per Room:	22,000	Utilization:	101%	p/p Ann Trans:	$25	Utilization:	100%
Portable Classrooms:	11	Annual Capital	550,000	p/p Rev Incen:	$110	Annual Capital:	550,000
Annual Rental Cost:	8,500	Rental Cost:	93,500	% Captl/State:	50%	Rental Cost:	78,094
Per Pupil Operating Exp TCS:	2,400			% diff Op Exp:	100%		

Summary of Costs	District General Fund	Other District	District Total	State Funds	Taxpayer Total	Total Per Pupil Expenditures: YRS Total	Percent YRS	TCS Total	Percent TSC	% Diff.
Annual Capital Costs										
TCS Annualized Capital Costs	275,000	0	275,000	275,000	550,000			503	17%	
TCS Rental of Portables	93,500	0	93,500	0	93,500			85	3%	
Sub-total for TCS	368,500	0	368,500	275,000	643,500			588	20%	
YRS Annualized Capital Costs	275,000	0	275,000	275,000	550,000	503	16%			
YRS Rental of Portables	78,094	0	78,094	0	78,094	71	2%			
Sub-total for YRS	353,094	0	353,094	275,000	628,094	574	19%			
YRS (cost)/savings	15,406	0	15,406	0	15,406	14				-21%
Annual Operating Costs										
TCS	2,625,600		2,625,600	1,837,920	2,625,600			2,400	80%	
YRS	2,625,600		2,625,600	1,837,920	2,625,600	2,400	79%			
YRS (cost)/savings	0		0	0	0	0				0%
Annualized Transition Costs										
Total	27,350		27,350	19,145	27,350	25	1%		1%	-38%
Special YRS Incentive Revenues										
Total	30,085		30,085	30,085	30,085	28	1%		1%	
COMPARISONS										
TCS Costs	2,994,100		2,994,100	2,112,920	3,269,100	2,988				
YRS Costs	2,975,959		2,975,959	2,162,150	3,311,129	3,027				
YRS (cost)/savings	18,141		18,141	(49,230)	(42,029)	(38)				
Per Pupil (cost)/savings	$16.58		$16.58	($45.00)	($38.42)					
Percent (cost)/savings	.61%		.61%	-2.28%	-1.27%					
			Savings to District	Cost to State	Cost to Public					

Enrollment: YRS	TSC	
273.50	820.50	25%
Total	1094	

Figure 3.

Hough, D., Zykowski, J., & Dick, J.
CERC @ UCR

CERC COST MODEL SUMMARY WORKSHEET — Scenario 4 — XYZ DISTRICT TRANSITION COSTS

Background Variables		Calculated TCS Vars		Decisions		Calculated YRS Vars	
Total School Enrollment:	1094			Calendar:	45/15	Calendar Code:	1
Pupil Teacher Ratio:	30	TCS Teachers	36	% Tch ExtCont:	0%	YRS Teachers:	36
Permanent Classrooms:	25	Classrooms:	36	% student YRS:	100%	Classrooms:	27
Annual Cost per Room:	22,000	Utilization:	101%	p/p Ann Trans:	$50	Utilization:	100%
Portable Classrooms:	11	Annual Capital	550,000	p/p Rev Incen:	$110	Annual Capital:	550,000
Annual Rental Cost:	8,500	Rental Cost:	93,500	% Captl/State:	50%	Rental Cost:	19,975
Per Pupil Operating Exp TCS:	2,400			% diff Op Exp:	100%		

Summary of Costs	District General Fund	Other District	District Total	State Funds	Taxpayer Total	Total Per Pupil Expenditures: YRS Total	Percent YRS	TCS Total	Percent TSC	% Diff.
Annual Capital Costs										
TCS Annualized Capital Costs	275,000	0	275,000	275,000	550,000			503	17%	
TCS Rental of Portables	93,500	0	93,500	0	93,500			85	3%	
Sub-total for TCS	368,500	0	368,500	275,000	643,500			588	20%	
YRS Annualized Capital Costs	275,000	0	275,000	275,000	550,000	503	16%			
YRS Rental of Portables	19,975	0	19,975	0	19,975	18	1%			
Sub-total for YRS	294,975	0	294,975	275,000	569,975	521	17%			
YRS (cost)/savings	73,525	0	73,525	0	73,525	67				-72%
Annual Operating Costs										
TCS	2,625,600		2,625,600	1,837,920	2,625,600			2,400	80%	
YRS	2,625,600		2,625,600	1,837,920	2,625,600	2,400	78%			
YRS (cost)/savings	0		0	0	0	0				0%
Annualized Transition Costs										
Total	54,700		54,700	38,290	54,700	50	2%		2%	-54%
Special YRS Incentive Revenues										
Total	120,340		120,340	120,340	120,340	110	4%		4%	
COMPARISONS										
TCS Costs	2,994,100		2,994,100	2,112,920	3,269,100	2,988				
YRS Costs	2,854,935		2,854,935	2,271,550	3,370,615	3,081				
YRS (cost)/savings	139,165		139,165	(158,630)	(101,515)	(93)				
Per Pupil (cost)/savings	$127.21		$127.21	($145.00)	($92.79)					
Percent (cost)/savings	4.65%		4.65%	-6.98%	-3.01%					
			Savings to District	Cost to State	Cost to Public					

Enrollment YRS	TSC	
1094	0	100%
Total	1094	

Figure 4.

CERC COST MODEL SUMMARY WORKSHEET Scenario 5a XYZ DISTRICT CAPITAL = 100% STATE CONSTRUCTION

Background Variables		Calculated TCS Vars		Decisions		Calculated YRS Vars	
Total School Enrollment:	1094			Calendar:	45/15	Calendar Code:	1
Pupil Teacher Ratio:	30	TCS Teachers	36	% Tch ExtCont:	0%	YRS Teachers:	36
Permanent Classrooms:	36	Classrooms:	36	% student YRS:	100%	Classrooms:	27
Annual Cost per Room:	22,000	Utilization:	101%	p/p Ann Trans:	$25	Utilization:	76%
Portable Classrooms:	0	Annual Capital	792,000	p/p Rev Incen:	$110	Annual Capital:	601,700
Annual Rental Cost:	8,500	Rental Cost:	0	% Cap'l/State:	100%	Rental Cost:	0
Per Pupil Operating Exp TCS:	2,400			% diff Op Exp:	100%		

Summary of Costs	District General Fund	Other District	District Total	State Funds	Taxpayer Total	Total Per Pupil Expenditures: YRS Total	Percent YRS	TCS Total	Percent TSC	% Diff.
Annual Capital Costs										
TCS Annualized Capital Costs	0	0	0	792,000	792,000			724	23%	
TCS Rental of Portables	0	0	0	0	0			0	0%	
Sub-total for TCS	0	0	0	792,000	792,000			724	23%	
YRS Annualized Capital Costs	0	0	0	601,700	601,700	550	18%			
YRS Rental of Portables	0	0	0	0	0	0	0%			
Sub-total for YRS	0	0	0	601,700	601,700	550	18%			
YRS (cost)/savings	0	0	0	190,300	190,300	174				447%
Annual Operating Costs										
TCS	2,625,600		2,625,600	1,837,920	2,625,600			2,400	77%	
YRS	2,625,600		2,625,600	1,837,920	2,625,600	2,400	78%			
YRS (cost)/savings	0		0	0	0	0				0%
Annualized Transition Costs										
Total	27,350		27,350	19,145	27,350	25	1%		1%	64%
Special YRS Incentive Revenues										
Total	120,340		120,340	120,340	120,340	110	4%		4%	
COMPARISONS										
TCS Costs	2,625,600		2,625,600	2,629,920	3,417,600	3,124				
YRS Costs	2,532,610		2,532,610	2,579,105	3,374,990	3,085				
YRS (cost)/savings	92,990		92,990	50,815	42,610	39				
Per Pupil (cost)/savings	$85.00		$85.00	$46.45	$38.95					
Percent (cost)/savings	3.54%		3.54%	1.93%	1.25%					
			Savings to District	Savings to State	Savings to Public					

Enrollment		
YRS	TSC	
1094	0	100%
Total	1094	

Figure 5.

Hough, D., Zykowski, J. & Dick, J.
CERC @ UCR

AERA @ Bost., Mass.
April 20, 1990

District

CERC COST MODEL SUMMARY WORKSHEET — Scenario 5b — XYZ DISTRICT — CAPITAL = 100% [redacted] CONSTRUCTION

Background Variables		Calculated TCS Vars		Decisions		Calculated YRS Vars	
Total School Enrollment:	1094			Calendar:	45/15	Calendar Code:	1
Pupil Teacher Ratio:	30	TCS Teachers	36	% Tch ExtCont:	0%	YRS Teachers:	36
Permanent Classrooms:	36	Classrooms:	36	% student YRS:	100%	Classrooms:	27
Annual Cost per Room:	22,000	Utilization:	101%	p/p Ann Trans:	$25	Utilization:	76%
Portable Classrooms:	0	Annual Capital	792,000	p/p Rev Incen:	$110	Annual Capital:	601,700
Annual Rental Cost:	8,500	Rental Cost:	0	% Captl/State:	0%	Rental Cost:	0
Per Pupil Operating Exp TCS:	2,400			% diff Op Exp:	100%		

Summary of Costs	District General Fund	Other District	District Total	State Funds	Taxpayer Total	Total Per Pupil Expenditures: YRS Total	Percent YRS	TCS Total	Percent TSC	% Diff.
Annual Capital Costs										
TCS Annualized Capital Costs	792,000	0	792,000	0	792,000			724	23%	
TCS Rental of Portables	0	0	0	0	0			0	0%	
Sub-total for TCS	792,000	0	792,000	0	792,000			724	23%	
YRS Annualized Capital Costs	601,700	0	601,700	0	601,700	550	18%			
YRS Rental of Portables	0	0	0	0	0	0	0%			
Sub-total for YRS	601,700	0	601,700	0	601,700	550	18%			
YRS (cost)/savings	190,300	0	190,300	0	190,300	174				447%
Annual Operating Costs										
TCS	2,625,600		2,625,600	1,837,920	2,625,600			2,400	77%	
YRS	2,625,600		2,625,600	1,837,920	2,625,600	2,400	78%			
YRS (cost)/savings	0		0	0	0	0				0%
Annualized Transition Costs										
Total	27,350		27,350	19,145	27,350	25	1%		1%	64%
Special YRS Incentive Revenues										
Total	120,340		120,340	120,340	120,340	110	4%		4%	
COMPARISONS										
TCS Costs	3,417,600		3,417,600	1,837,920	3,417,600	3,124				
YRS Costs	3,134,310		3,134,310	1,977,405	3,374,990	3,085				
YRS (cost)/savings	283,290		283,290	(139,485)	42,610	39				
Per Pupil (cost)/savings	$258.95		$258.95	($127.50)	$38.95					
Percent (cost)/savings	8.29%		8.29%	-7.05%	1.25%					
			Savings to District	Cost to State	Savings to Public					

Enrollment: YRS	TSC	
1094	0	100%
Total	1094	

22

Figure 6.

Hough, D., Zykowski, J. & Dick, J.
CERC @ UCR

All of the numbers attributed to TCS variables are calculated based on the background information. In the normative scenario assuming 100% classroom utilization, 36 classrooms and 36 teachers are needed, and the annual capital outlay is $550,000.00 for constructed buildings and $93,500.00 for portable classrooms.

The next section involves a set of normative decisions regarding the type of YRC being simulated, teacher contracts (i.e., extensions/work load), transition costs, and special revenue incentive funds. Also, the funding source (state, local, other) for capital costs are included, here. As can be seen in figure 1, the norms are: 45/15 calendar, no extended teacher contracts, 100% of students on the YRC, transition costs of $25.00 per student, state incentive revenues of $110.00 paid to districts, construction funding 50% state-50% district (matching funds), with operating expenses held constant.

The calculated YRS variables produced a need for 36 teachers in 27 classrooms utilized at 100% of capacity. Annual capital outlay remains the same with only $19,975.00 in annualized costs for portables--compared with $93,500.00 needed for the TCS.

This normative scenario shows that the school district stands to save 5.56% by converting to a YRC; the state, however, must spend 6.19% more; the cost to the taxpayer for XYZ School District to convert to a YRS is 2.22%. While total taxpayer operating costs make up 79% of the YRS total expenditures, construction represents 16%, rent for portables constitutes 1%, transition costs are 1%, and revenue incentives are 4% of the $3,056.00 per pupil YRS costs. On the TSC, 80% of the total taxpayer contribution goes to operating expenses, 17% for school construction, 3% for portables. There would be no transition nor special revenue expenses.

After having developed and analyzed the normative model, it becomes helpful to change the normative scenario assumptions while holding the cost model assumptions constant. In essence, the school calendar no longer becomes the single independent variable: policy decisions made to simulate a facsimile school program can impact cost. Therefore, insight can be gained by manipulating these various policies to determine how they are related to expenditure patterns.

Scenario 2: Extended Teacher Contracts

The only change, here, is to assume that the district will extend contracts from 184 to 220 days for 100% of the teachers--(realizing a savings in benefits calculated on a set of personnel work sheets in Appendix A)--thus requiring only 27 teachers and 27 classrooms to maintain a 30-1 teacher-student ratio as opposed to the 36 teachers needed on the TSC. This produces an estimated reduction in operating expenses of 9% for the YRS and saves the district $368.21 per pupil, or 13.45%--approximately 8% greater savings than when hiring additional faculty, as assumed in the normative scenario. Instead of costing the state and the taxpayer, each would now save 1.23% and 4.96%, respectively, when the district converts to a YRS.

By reducing the number of classrooms needed from 36 to 27, proportional to the number of teachers, capital costs could be reduced by not having to pay for the nine surplus portable buildings. While this is an option for schools that have portable buildings, it is not an option for schools whose facilities are comprised of 100% permanently constructed buildings.

Further analysis of scenario 2 not represented in figure 2 shows that by placing 50% of the teachers on extended contracts and leaving 50% on the TSC schedule, the districts saves 9.07%; the state incurs a cost of 3.03%; the taxpayer saves .94%. If the extended contract option is exercised at a 25% rate, the savings to the district is 7.32%; the state cost climbs to 4.64%; the taxpayer incurs a cost of .66%.

Scenario 3: Number of Students on YRC

Previous scenarios assumed that 100% of the students would be placed on a year-round attendance schedule. Here, the assumption is that only a portion of the total enrollment will be placed on year-round schedules, while other students in the district will attend TCSs.

If 25% of the district enrollment is placed on a YRC, the district stands to save .61% by converting to a YRS; the state cost is 2.28%; the taxpayer cost is 1.27%. This happens because the state incentive revenues (while income to a district is an expense to the state and taxpayer) are based on YRS ADA, not total enrollment; therefore, fewer dollars are realized as income for the district. If 50% of the students were on a YRC the district would save 2.26%; the state cost would increase to 3.62%; the taxpayer cost would be 1.59%.

Scenario 4: Transition Costs

When the per pupil transition cost is doubled from $25 to $50, the district savings is 4.65%, down approximately 1% from the 5.56% normative scenario. The state cost rises from 6.19% (normative) to 6.98%; the taxpayer cost likewise increases from 2.22% (normative) to 3.01%. When transition costs were computed as a reduction to $10 per pupil (not shown in figure 4), the district savings was increased to 6.11%; the state cost is reduced to 5.71%; taxpayer cost went down to

1.74%. In all cases, the normative, the doubled increase, or the $10 per pupil amount for transition from a TSC to a YRC, less that 2% of the total cost/savings is attributable to the change, leading one to conclude that decisions relating to annualized transition costs are the least influential component of the model. Even this fact would change if transition costs were not annualized, or if the length of annualization were markedly shortened to, say five years.

Scenario 5a: Capital = 100% District Construction

For this comparison two variables were changed. First, the funding source was identified as 100% cost to the district. Second, the classrooms were all converted to constructed buildings--to control for possible "shrinkage" when portables are used. That is, instead of having the option of reducing a capital facility, the cost of the existing building could only be redistributed among the number of classrooms and/or students in the facility.

When this was done, the district savings was 8.29%; the state cost was 7.05%; the taxpayer savings was 1.25% -- three vitally different results. When compared to the normative scenario, this meant that the district saved almost 3% more, the state cost increased by approximately 1%, and the taxpayer saved almost 3% more. The funding source is important because only the entity incurring the expense of building will realize the savings (capital costs avoided) by not having to construct the facility.

Scenario 5b: Capital = 100% State Construction

As in scenario 5a, two variables were changed: funding source and total construction with no portable classroom option. When this was done, here, 100% of the cost to construct school facilities was assumed to be a state expense. This produced a reduction in district savings to 3.54% (down from 5.56% in the normative); a savings to the state of 1.93% (from a 6.19% cost in the normative); a 1.25% saving to the taxpayer (from a 2.22% cost in the normative). Again, the funding source combined with the elimination of a portable classroom option, contributed to the dramatic swing in cost/savings.

Discussion

What have we learned from this incipient cost-effects study? Pilot data enabled us to validate the cost model and to derive a set of normative scenario assumptions. While the model and assumptions allow us to control for anomalies and, hence, manipulate the school calendar or attendance schedule as the single independent variable, a more intriguing research question asks, "How do policies regarding implementation of YRE affect cost?"

To answer the question, "Which calendar plan costs/saves more: TSC or any number of YRCs?" is the incorrect way to phrase the quarry. Given a set of common background characteristics combined with a set of policy decisions, any number of scenarios can be produced. Data from our pilot districts show that the school district always saved money by converting to a YRC, whereas the state and taxpayer could either realize a savings or a cost. When might a district find that converting to a YRC would be more costly than operating on a TSC? The key component appears to be in operating expenses. If significant changes must be made in the delivery of services to insure that programs remain intact, then the district may incur a cost.

Additionally, if construction costs are not district expenses or if the state does not provide significant revenue incentives, then the district may find conversion to a YRC expensive. Theoretically, it is possible for a district to spend so much money on transition costs that the conversion to a YRC is expensive; however, this is highly improbable.

What is needed, now, is a continuation of this study either to collect more data which will allow the researchers to calculate the optimal, i.e., most cost-efficient school calendar or to continue with the myriad variable manipulations (using both conceptual and actual data) that produce differing scenarios. After the cost issue is determined, educational and social outcome measures need to be compared to the fiscal impacts to complete the cost-effects analysis.

REFERENCES

California Association of School Business Officials. (1989). *Budget development for year-round education.* Report Presented to the Sixty-second Annual Conference of the California Association of School Business Officials, Lake Tahoe, California, April 24-27.

California Assemble Office of Research. (1986). *Orchard plan.* Sacramento, CA: Author.

California Coalition for Public Education. (1988). *Too many students: Not enough room.* Los Angeles, CA: Author.

California Department of Finance. (1986). *An assessment of the need for funding to provide facilities for the unhoused school population anticipated between 1986 and 1991,* Report No. D 86-1. Sacramento: CA. Author.

California Legislative Analyst Office. (1970). *Year-round operation of the public schools of California.* Sacramento, CA: Joint Legislative Budget Committee.

Chambers, J. (1981). *Cost and price level adjustments to state aid for education: A theoretical and empirical review.* (IFG Project Report No. 81-A3). Stanford, CA: Stanford University, Institute for Research on Educational Finance and Governance.

Educational Research Service, Inc. (1974). *Evaluations of year-round school programs.* Fullerton, CA: Author.

Gandara, P. & Delapp, L. (1986). *The orchard plan: A new way of delivering K-6 education.* Sacramento, CA: Assembly Office of Research.

Guthrie, T. (1985). *Final evaluation report. Year-round school 1984-85.* Houston, TX: Houston Independent School District.

Hartman, W. T. (1981). Estimating the costs of educating handicapped children: A resource-cost model approach, summary report. *Evaluation and Policy Analysis.* 3(4), 33-48.

Hawley. D. E., Fletcher, J. D. & Piele, P. K. (1986). Costs, effects, and utility of microcomputer-assisted instruction. Eugene, OR: University of Oregon, Center for Advanced Technology in Education.

Hecht, J. B. (1989). *Cost effects analysis applied to California's regional occupational centers and programs.* Ph.D. dissertation, University of California, Riverside.

Honig, B. (1986). Commencement time for year-round education. *Los Angeles Times*, June 8, sect. V.

Hough, D., Zykowski, J., & Mitchell, D. E. (1990). *A review of year-round education research*. Riverside, CA: California Educational Research Cooperative.

Hu, T., Lee, M. L. & Stromsdorfer, E. W. (1971). Economic returns to vocational and comprehensive high school graduate. *Journal of Human Resources,* 25-50.

Illinois State Office of Superintendent of Public Instruction. (1972). *The cost of educational operation: The traditional school year vs. the year-round school.* Springfield, IL: Division of Research and Development. (ERIC Document Reproduction Service No. ED 077 117.)

Jamison, D. T., Klees, S. J. & Wells, S. J. (1978). *The costs of educational media.* Beverly Hills, CA: Sage.

Kilbert, G. H. (1988). *Year-round education calendar and enrollment plans.* Sacramento, CA: State Department of Education.

Knapp, J., Smith, S. L. & Wright, J. S. (1978). A cost study of year-round schools in Prince William County. Charlottesville, VA: Taylor Murphy Institute. (ERIC Document Reproduction Service No. ED 170 874.)

Knapp, J., Morris, S. W. & Wright, J. S. (1976). 45-15 costs: A cost study of Loudon County's 45-15 programs. Charlottesville, VA: Tayloe Murphy Institute. (ERIC Document Reproduction Service No. ED 128 975.)

Levin, H. M. (1970). A cost-effectiveness analysis of teacher selection. *Journal of Human Resources, 5*, 24-33.

Levin, H. M. (1975). Cost effectiveness analysis in evaluation research. In M. Guttentag & E. Struening (Eds.), *Handbook of evaluation research, 2*, pp. 89-122). Beverly Hills, CA: Sage.

Levin, H. M. (1983). *Cost-effectiveness: A primer.* Beverly Hills, CA: Sage.

Levin, H. M. (1988). Cost-effectiveness and educational policy. *Education Evaluation and Policy Analysis, 10*, 51-69.

Levin, H. M. (1989). Mapping the economics of education. *Educational Researcher, 18,* 13-16.

Levin, H. M., Glass, G. V. & Meister, G. R. (1984). Cost-effectiveness of four educational interventions. IFG Project Report 84-A11, Institute for Research on Educational Finance and Governance, Stanford University, Palo Alto, CA.

Levin, H. M., Glass, G. V. & Meister, G. R. (1987). A cost-effectiveness analysis of computer-assisted instruction. *Evaluation Review, 11*, 50-72.

Levin, H. M., Leitner, D. & Meister, G. R. (1986). *Cost-effectiveness of alternative approaches to computer-assisted instruction* (87-CERAS-1). Stanford, CA: Stanford University, Center for Educational Research.

Levin, H. M. & Meister, G. R. (1985). *Educational technology and computers: Promises, promises, always promises* (Project Report No. 85-A13). Stanford, CA: Stanford University, Institute for Research on Educational Finance and Governance.

Levin, H. M. & Woo, L. (1981). An evaluation of the costs of computer-assisted instruction. *Economics of Education Rev., 1*, 1-26.

Matthews, P., Zykowski, J., and Hough, D. (1989). *Year-round education feasibility guidelines*. Riverside, CA: California Educational Research Cooperative.

Pelavin, S. H. (1978). *A study of year-round schools.* Executive Summary. Menlo Park, CA: Stanford Research Institute.

Pelavin, S. H. (1979, March). *A study of year-round schools.* Vol. 1: Final Report. Menlo Park, CA: Stanford Research Institute.

Rifkin, N. S. (1973). How to make the switch to year-round schools. *American School Board Journal, 160*, 40-45.

Rossi, P. H., Freeman, H. E. & Wright, S. R. (1979). *Evaluation: A systematic approach.* Beverly Hills, CA: Sage.

Thomas, G. I. (1966). *Extended school year designs--an introduction to new plans of school organization which can result in financial economies and provide more education for all pupils.* Albany, NY: New York State Education Department.

Univer, I. O. (1976). Can year-round schools save money? *American School and University, 48*, 34-35.

Utah State Office of Education. (1990). *Statewide evaluation of year-round and extended-day schools*. Salt Lake City, Utah: Author.

Waner, A. W. (1975). *The flexible and extended contract as being practiced in year-round schools in California, 1973-74.* Ph.D. dissertation, University of Southern California.

Weisbrod, B. (1965). Preventing high school dropouts. In R. Dorfman (Ed.), *Measuring benefits of government investments* (pp. 117-148). Washington, DC: The Brookings Institute.

1 of 10 Planning Worksheet - Assumptions Affecting Costs

Directions: Answer Y for yes or N for no in column A next to each item. Write in details beneath each yes answer starting in column A.

_______________ Date Collected - M/D/Y

_______________ District Name
_______________ School Name
_______________ CDS Code #

REGULAR EDUCATION PROGRAM

_______ a. Extend Contracts for Teachers and Aides?

_______ b. Regular Teacher Substitute Incentives?

_______ c. Staff Development Increased?

_______ d. Instructional Supply Allocation Changed?

_______ e. Textbooks for Each Student?

_______ f. Single Subject Offerings Expanded?

_______ g. Intersession Classes Provided?

_______ h. Other Considerations in Regular Education Program?

SPECIAL EDUCATION PROGRAMS

_______ i. SDC Classes Converted to Year-Round?

_______ j. Extended Year Covered by Intersession?

_______ k. RSP Work Year Extended?

_______ l. DIS Personnel Work Year Extended?

_______ m. Other Considerations on Special Education Program?

_______ n. Special Projects Service Delivery Changed?

SUPPORT SERVICES

_______ o. Instructional Administration Changes?

_______ p. Instructional Media Changes?

_______ q. School Administration Changes?

_______ r. Pupil Services Changed?

_______ s. District Administration Changes?

_______ t. Centralized Data Processing Changes?

________u. Plant Maintenance Changes?

____

________v. Plant Operation Changes?

____

________w. Pupil Transportation Changes?

____

________x. Auxiliary Programs Changes?

____

TRANSITION COST ASSUMPTIONS

Directions: For each category listed, indicate Y or N if one-time costs will be incurred. Explain briefly on the line following.

________Planning Costs.

____

________Inservice Training Costs.

____

________Curriculum Related Costs.

____

________Evaluation Costs.

____

________Capital Outlay Costs.

____

INCENTIVE FUNDING/REVENUE VARIANCES

________a. SB 813 (EC 42250) Funding @ $25 per YRE Enrollment.

____

________b. SB 327 (EC 42250.3) Funding up to $131 per YRE Enrollment.

____

________c. EC 42250.1 Funding for Air Conditioning/Insulation.

____

________d. Intersession vs. Summer School Variances.

____

________e. ADA to enrollment variances.

____

________f. Other funding changes or variances.

____

2 of 10 Data - Teacher, Student, & Classroom counts,
Student Ethnicity, Room Use, Calendar.

District School Date Collected

_____ Cost Model Year
(1 = Last Year, 2 = This Year, 3 = Next Year)
_____ Year-round Calendar Used in Simulation
(1= 45/15, 2= 60/20, 3= 90/30, 4= C-6, 5= C-6Mod,
6= 4 Qrtr, 7= 5 Qrtr, 8= Orchard, 9= Other)
0 Desired . pil/Teacher Ratio
0 Total Number of Regular Classroom Teachers

ENROLLMENT
Count by Grade

0	Kindergarten	
0	First Grade	1
0	Second Grade	2
0	Third Grade	3
0	Fourth Grade	4
0	Fifth Grade	5
0	Sixth Grade	6
0	Seventh Grade	7
0	Eighth Grade	8
0	Ninth Grade	9
0	Tenth Grade	10
0	Eleventh Gr.	11
0	Twelvth Gr.	12

Other Categories (specify below)
0 _____
0 _____
0 _____
0 _____
0 TOTAL ENROLLMENT

0 Source of Enrollment Figures.
(1 = CBEOS, 2 = P-2, 3 = Current, 4 = Projected)

STUDENT ETHNICITY
Enter the Approximate percentage of the student population in each category listed. (should equal 100%)

0 Caucasian
0 Hispanic
0 Black
0 Asian
0 American Indian
0 Other
0 Keep Trying, your figures don't add up!

CLASSROOM SPACE AVAILABLE
Type the number of classrooms in each category. Do not count rooms more than once.

0 Original Classrooms in the School
0 Classrooms Added (include purchased portables)
0 Converted Classrooms (rooms not intended as classrooms)
0 Portable Classrooms (rentals which could be removed)

CLASSROOM USE

0 Double Session Rooms (kindergarten)
0 Library - Learni~g Resource Center
0 Computer Lab
0 Migrant Classroom (not used as regular classroom)
0 Bilingual Classrooms (funded from special sources)
0 Other Classrooms which may affect Capacity Calculations
0 _____

3 Space; School Capacities, Space Utilization Options

3 of 10 Space Availability and Utilization
(Directions: Fill in appropriate Data in Column A)

District ____________ School ____________ Date ________

0	Dbl Sesn ClsRms (KG)					
0	Pupil/Teacher ratio					
0	Regular Teachers	#DIV/0!	Current P/T ratio			Current
0	Current Enrollment	0	Expected Enrollment			Utilization
0	Original Classrooms	0	Original Capacity	#DIV/0!	of Original	
0	Built-on Classrooms	0	Increased Cap.	#DIV/0!	of Incr Cap	
0	Converted Classrms					
0	Rent Portable Clsrms	0	Extended Cap.	#DIV/0!	of Ext Cap	
	0 Total Classrooms					

Optional Plans for Meeting Growth Needs

Capcty	Traditional Schedule: New School	New Rooms	Rentals		Year-Round Schedule: Add 25%	Add 33%	Add 50%
Original				Orig.Cap	0	0	0
Increase	0			Incr.Cap	0	0	0
ClsRms							
Needed	0	0	0		0	0	0
Capital Cost Avoided					0	0	0
Teachrs							
Extended Contract			0		0	0	0
Incremental Salary Savings					0	0	0

****

Projected Conditions for Next Year

				Percent
0	(Current)			
0	Projected Enrollment	0 Over Increased Cap.	#DIV/0!	of Inc" Cap
0	Double Session Rooms	0 Over Extend Cap	#DIV/0!	of Ext Cap

****

	Traditional Schedule: New School	New Rooms	Rentals	Year-Round Schedule: Add 25%	Add 33%	Add 50%
Addtnl ClsRms	#DIV/0!	#VALUE!	#VALUE!	0	0	0
Tchr-Std	#DIV/0!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Tchr-Ext				0	0	0

Building Plans on Traditional Schedule

Est. Need	Plan for New Classrooms: New School	New Rooms	Rentals		Classroom Use Presently
#DIV/0!				Kindergarten	.00
#DIV/0!				Grades 1 - 6	.00
#DIV/0!				Grades 7 - 8	.00
#DIV/0!				Grades 9 - 12	.00
#DIV/0!				Other Classes	.00
				Total New	
Totals	0	0	0	0	

4 Build; Capital Costs Avoided

4 of 10 Capital Costs Avoided

Annual Rental Cost/Portable $7,300.00

Estimated Classroom Building Costs (furnishing included)

Grade Level	Needed ClsRms	Pupils per Rm	Pupil Capacity	Sq. Ft per Pupil	Total Sq. Ft	Cost per Sq. Ft.	New School Building	New ClsRms	Rented Portables
K	0	0	0	59	0	135.05	0	0	#VALUE!
1-6	0	0	0	59	0	133.28	0	0	#VALUE!
7-8	0	0	0	80	0	127.57	0	0	#VALUE!
9-12	0	0	0	106	0	127.57	0	0	#VALUE!
Other	0	0	0	59	0	151.92	0	0	#VALUE!
Totals	0				0		0	0	0

Additional Building or Setup Costs		New School Building	New ClsRms	Rented Portables
	Additional Furnishing Costs	0	0	0
	Site Aquistion Costs	0	0	0
	Site Development Costs	0	0	0
	Non-Classroom Construction	0	0	0
	Other Building/Setup Costs	0	0	0
	Estimated Totals	0	0	0
(to be supplied if already available)	Actual / Projected Costs	0	0	
	Difference in %			

Funding Sources for Classroom Building or Rental			Building	Added Rooms	Rentals
1. District General Fund			0	0	0
2. Other District:	Special Reserve		0	0	0
	Capital Facilities		0	0	0
	Other:		0	0	0
3. State Funds:	Leroy Greene		0	0	0
	Other:		0	0	0
4. Other Sources:	Mello Roos		0	0	0
	Other:		0	0	0

Annualized Capital Costs .05 Broker Fees (.02 - .05) Totals: 0 0 0

.07 Interest Rate (.06,.07,or.08)

Bond Life -	10 Build	10 Add On	20 Build	20 Add On	25 Build	25 Add On	Rental	Annual Subtotals (Bond Life? 20)
District								
General Fund	0	0	0	0	0	0		
Special Reserve	0	0	0	0	0	0		
Capital Reserve	C	0	0	0	0	0		
Other District	0	0	0	0	0	0		
Subtotal		0		0		0	0	0
State								
Leroy Greene	0	0	0	0	0	0		
Other State	0	0	0	0	0	0		
Subtotal		0		0		0	0	0
Other								
Mello Roos	0	0	0	0	0	0		
Other Local	0	0	0	0	0	0		
Subtotal		0		0		0	0	0

CERC

Year-round Cost Analysis Program

5 Cert; Certified Personnel

Certificated Personnel On Year-Round Schedule

Position	No.	Contr Days	Daily Salary	Total Salary	Benefit rates: Retire	OASDI	H & W	SUIns	Wkmns Comp	Total Benefits	Total YRS Sal Benefit
1 = Principal				0	0	0	0	0	0	0	0
2 = Ast. Prin.				0	0	0	0	0	0	0	0
3 = Counselor				0	0	0	0	0	0	0	0
4 = Teachers				0	0	0	0	0	0	0	0
5 = RSP--Res.Spec.				0	0	0	0	0	0	0	0
6 = DIS				0	0	0	0	0	0	0	0
7 = Sub.Teachers				0	0	0	0	0	0	0	0
8 = Pupil Ser.				0	0	0	0	0	0	0	0
9 = Instr. Admin.				0	0	0	0	0	0	0	0
10= Sch.Admin.				0	0	0	0	0	0	0	0
11= Other				0	0	0	0	0	0	0	0
12= Other				0	0	0	0	0	0	0	0
Totals	0			0	0	0	0	0	0	0	0

Certificated Personnel on Traditional Schedule

Position	No.	Contr Days	Daily Salary	Total Salary	Benefit rates: Retire	OASDI	H & W	SUIns	Wkmns Comp	Total Benefits	Total TSC Sal &Benefit	Total YRS Sal Benefit	Difference
1 = Principal				0	0	0	0	0	0	0	0	0	0
2 = Ast. Prin.				0	0	0	0	0	0	0	0	0	0
3 = Counselor				0	0	0	0	0	0	0	0	0	0
4 = Teachers				0	0	0	0	0	0	0	0	0	0
5 = RSP--Res.Spec.				0	0	0	0	0	0	0	0	0	0
6 = DIS				0	0	0	0	0	0	0	0	0	0
7 = Sub.Teachers				0	0	0	0	0	0	0	0	0	0
8 = Pupil Ser.				0	0	0	0	0	0	0	0	0	0
9 = Instr. Admin.				0	0	0	0	0	0	0	0	0	0
10= Sch.Admin.				0	0	0	0	0	0	0	0	0	0
11= Other				0	0	0	0	0	0	0	0	0	0
12= Other				0	0	0	0	0	0	0	0	0	0
Totals	0			0	0	0	0	0	0	0	0	0	0
Difference Between Yr-Rnd & Trdnl — YRC total -TSC total													
Total Difference:	0			0	0	0	0	0	0	0	0		
Percent Difference:				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		

CERC

Year-round Cost Analysis Program

Appendix A

. . . continued

Hough, D., Zykowski, J. & Dick, J.
CERC @ UCR

Year-round Cost Analysis Program

6 Class; Classified Personnel

Classified Personnel On Year-Round Schedule ______

Benefit rates

Position	No.	Contr Days	Daily Salary	Total Salary	Retire	OASDI	H & W	SUIns	Wkmns Comp	Total Benefits	Total YRS Sal Benefit
1 = Custodian(s)				0	0	0	0	0	0	0	0
2 = Food Service				0	0	0	0	0	0	0	0
3 = Secretarial				0	0	0	0	0	0	0	0
4 = Clerical				0	0	0	0	0	0	0	0
5 = Consultant				0	0	0	0	0	0	0	0
6 = Aides				0	0	0	0	0	0	0	0
7 = Libr/Proj Clerk				0	0	0	0	0	0	0	0
8 = Yard				0	0	0	0	0	0	0	0
9 = Other				0	0	0	0	0	0	0	0
Totals	0			0	0	0	0	0	0	0	0

Classified Personnel on Traditional Schedule

Benefit rates

Position	No.	Contr Days	Daily Salary	Total Salary	Retire	OASDI	H & W	SUIns	Wkmns Comp	Total Benefits	Total TSC Sal &Benefit	Total YRS Sal Benefit	Difference
1 = Custodian(s)				0	0	0	0	0	0	0	0	0	0
2 = Food Service				0	0	0	0	0	0	0	0	0	0
3 = Secretarial				0	0	0	0	0	0	0	0	0	0
4 = Clerical				0	0	0	0	0	0	0	0	0	0
5 = Consultant				0	0	0	0	0	0	0	0	0	0
6 = Aides				0	0	0	0	0	0	0	0	0	0
7 = Libr/Proj Clerk				0	0	0	0	0	0	0	0	0	0
8 = Yard				0	0	0	0	0	0	0	0	0	0
9 = Other				0	0	0	0	0	0	0	0	0	0
Totals	0			0	0	0	0	0	0	0	0	0	0
Difference Between Yr-Rnd & Trdnl		YRC total -TSC total											
Total Difference:	0			0	0	0	0	0	0	0	0		
Percent Difference:				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		

Appendix A

. . . continued

Year-round Cost Analysis Program

7 Oper; Operating Expenses

7 of 10

Non-Salary Operating Expenses

Expenditure	Year-Round Amount	Year-Round Totals	Traditional Amount	Traditional Totals	Difference
Books & Supplies (4000)	______		______		0
1 = Textbooks (4100)	______		______		0
2 = Other Books (4200)	______		______		0
3 = Instr. Supplies(4300)	______		______		0
4 = Other Supplies(4500)	______		______		0
5 = Sub-total		0		0	0
Services, Op. Exp.(5000)					0
6 = Transportation	______		______		0
7 = Consultants (5100)	______		______		0
8 = Travel & Exp. (5200)	______		______		0
9 = Dues/Memberships(5300)	______		______		0
10= Insurance (5400)	______		______		0
11= Utilities (5500)	______		______		0
12= Rent/Lease (5600)	______		______		0
13= Other (5700)	______		______		0
14= Other (5800)	______		______		0
15= Sub-total		0		0	0
Capital Outlay (6000)					0
16= Site Impro.(6100)	______		______		0
17= Buildings(6200)	______		______		0
18= New Library Books(6300)	______		______		0
19= Equipment(6400)	______		______		0
20= Equip.Replac.(6500)	______		______		0
20= Sub-total		0		0	0
Other Outgo/Supt/Indir(7000)					0
21	______		______		0
22	______		______		0
23	______		______		0
24= Sub-total		0		0	0
		===========		===========	===========
Total Non-Salary Expense		0 YRS		0 TSC	0

Percent Difference #DIV/0!

49

Year-round Cost Analysis Program

8 TotOp; Total Operating Costs

8 of 10

Total Operating Costs
Summary Sheet

Major Object Expense Category	Year-Round Schedule	Traditional Calendar	Difference YRS - TSC	Percent Differ
1= Certificated Sal.	0	0	0	#DIV/0!
2= Certificated Ben.	0	0	0	#DIV/0!
3= Classified Sal.	0	0	0	#DIV/0!
4= Classified Ben.	0	0	0	#DIV/0!
5= Books & Supplies	0	0	0	#DIV/0!
6= Ser. Oth. Op. Exp.	0	0	0	#DIV/0!
7= Capital OUtlay	0	0	0	#DIV/0!
8= Oth.Outgo/Dir./Indir.	0	0	0	#DIV/0!
9= Total Expenditures	0	0	0	#DIV/0!

Total Enrollment: 0

Per Pupil Cost	#DIV/0!	#DIV/0!	#VALUE! Cost Per Pupil on Yr-Round
Percent Change per pupil on switch to year-round	#VALUE! decrease		

Year-round Cost Analysis Program

9 Tran; Transition Costs & Revenue Incentives

9 of 10 ________ ____________

Transition Costs

	Tran.to YRS			
Planning			Enroll. 0	
1 = Research	________			
2 = Consultant	________		Special Revenue Incentives	
3 = Policy Development	________			
4 = IMS Development	________		EC 42250 ($25)	0
5 = Community Relations	________			
			EC 42250.3 ($131)	0
6= Sub-total		0		
			EC 42250.1 (Air Cond)	________
In-Service Training				
7 = Substitutes	________		Intercession/Summer Sch.	________
8 = Consultant	________		Variance	
9 = Curriculum Committees	________			
10= Curr. Guide Revision	________		ADA to Enrollment Variance	________
11= Other________	________			
			Other	________
12= Sub-total		0		________
Instructional/Curriculum			Total	0
13= Material & Supplies	________			
Evaluation				
14= Student Achievement	________			
15= Comm./Sch. Surveys	________			
16= Consultant	________			
17= Evaluation Reports	________			
18= Other________	________			
19= Sub-total		0		
Capital Outlay				
20=Air Conditioning	________			
21=Equipment	________			
22=Facility Modification	________			
23=Other________	________			
24= Sub-Total		0		
		==========		
25 = Total Principle		#VALUE!		

Annual Payment spread over 20 years at 7% interest	Total Interest	Total Payable
#VALUE!	#VALUE!	#VALUE!

Year-round Cost Analysis Program

10 Sum; Summary of Costs

10 of 10

Summary of Costs

	District Funds	State Funds	Other Funds	Total	Per Pupil
Capital Costs Avoided					
1 = Annualized Capital Cost	0	0	0	0	#DIV/0!
2 = Annual Lease/Rent Cost	0	0	0	0	#DIV/0!
Annual Operating Costs					
3 = Under YRS	0			0	#DIV/0!
4 = Under TCS	0			0	#DIV/0!
5 = Cost/Savings Under YRS	0			0	#DIV/0!
Annualized Transition Cost					
6 = Annualized Transition	0			0	#DIV/0!
YRC Special Revenue Incentive					
7 = Revenue Incentives	0	0		0	#DIV/0!
Comparisons					
YRC Costs	0			0	#DIV/0!
TSC Costs	0			0	#DIV/0!
Savings/Cost					
Net Savings on YRS	0			0	#DIV/0!
Per Pupil Savings/Cost	#DIV/0!	Savings to district		0	
Percent Savings/Cost	#DIV/0!			#DIV/0!	

Base Enrollment: 0

:2