YEAR-ROUND OPERATIONS of EDUCATIONAL INSTITUTIONS and the IMPLICATIONS FOR HAWAII

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FOREWORD

Legislative interest in exploring ways in which school facilities can be used most effectively to meet estimated enrollment increases on the elementary, secondary, and college levels led to this report on year-round operations of educational institutions. This concern is not unique to Hawaii, for the literature indicates that similar inquiries were raised by a number of school districts and by universities on the Mainland.

The legislative reference bureau is grateful for the kind assistance it received from Mainland institutions which were visited by the author or which engaged in correspondence with us. Personnel at the University of Pittsburgh were especially helpful in discussing trimester operations and in reviewing that section in this report.

For furnishing basic data which made it possible to explore the feasibility of year-round operations for the public schools and for reviewing the chapter dealing with this subject, the bureau acknowledges the cooperation and aid of the department of education, especially the business office, the personnel office, and the administrative staff of Kailua High School.

Tom Dinell
Director

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TABLE OF CONTENTS

Figure

Tables

Chapter I
INTRODUCTION

Quality education is the heart of democracy's well-being and survival. The challenges to education have always been many, but in the contemporary period they are magnified because of the "explosion of knowledge". There is so much more to learn. All institutions of education--from the kindergarten through the university--share the responsibility of imparting knowledge and of preparing youth for tomorrow's living.

The Problem

The task of maintaining quality education is further complicated by several other factors: (a) increase in the number of students seeking education, particularly on the higher education level, (b) a shortage of qualified teachers and professors, and (c) a concern that physical plant construction will not keep pace with enrollment increases. In 1960 there were an estimated 42.6 million children in elementary and secondary schools, and an estimated 3.6 million students in college. Estimates for 1970 indicate an increase of 18 to 25 per cent on the elementary and secondary level and of 46 to 95 per cent on the higher education level, depending on one's assumptions on fertility levels and enrollment rates.[1]

Elementary and secondary schools in the previous decade were much concerned about enrollment increases and

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[1]U. S. Bureau of the Census, Illustrative Projections to 1980 of School and College Enrollment in the United States, Current Population Reports, Population Estimates, Series P-25, No. 232 (Washington, D. C.: June 22, 1961), pp. 7-8.

in the early 1950's, several school districts conducted studies on the feasibility of operating on a year-round basis. Since mid-1950, however, interest in year-round operations has been most active in universities. There are several reasons for this.

The prospective shortage of teachers and professors has been estimated in various ways, but recently the concern over the limited number of professors has received most of the attention in view of the sharply rising enrollments which are predicted for colleges and universities. Furthermore, if the Ph.D. degree is considered desirable preparation for college teaching, there is reason for greater concern. The Research Division of the National Education Association indicates the proportion of newly-employed professors with doctoral degrees was less in 1960-61 than it was in 1953-54.[2]

If institutions of higher education are to accommodate the increasing number of students under current academic calendars, an extensive construction program will be necessary--and soon. Although most of the available data indicate that there is great variation among institutions in the extent to which they utilize their physical plant, fuller use of facilities has been proposed only as a partial answer at best.

Growing in popularity in recent years is the notion of altering the academic calendar to provide for year-round operations which will result in the maximum utilization of physical facilities. Institutions vary in their proposals for calendar changes; what is common is the desire to give students the opportunity to complete their

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[2]National Education Association, Research Division, Teacher Supply and Demand in Universities, Colleges, and Junior Colleges, 1958-59 and 1960-61 (Washington, D. C.: the Association, 1961), p. 15.

baccalaureate work in less than four years; to offer professors an extra term of employment periodically, still maintaining some periods for research, reflection, and new experiences; and to operate the plant for 11-12 months. While the plant may be in operation year-long, it is not mandatory for all students to study or all professors to instruct during the entire year.

Scope of the Study

The legislative request which gave rise to this study was primarily concerned with the feasibility of operating Hawaii's elementary and secondary schools on a year-long basis. However, current activities in several institutions of higher education resulted in the inclusion of some of their studies and calendar modifications.

Chapter II reviews briefly the studies on year-round operations conducted by elementary and secondary schools as well as the experiences of selected schools which undertook such operations in the past. Chapter III explores the feasibility of year-round operations for Hawaii's public schools by the hypothetical application of a four-quarter calendar to a high school whose enrollment is expected to increase sharply in the next few years. Chapter IV presents some of the studies conducted by and subsequent decisions reached by higher education institutions. Chapter V presents some conclusions which may have implications for Hawaii.

Chapter II

STUDIES AND EXPERIENCES OF SELECTED ELEMENTARY AND SECONDARY SCHOOLS

Many school districts have studied the feasibility of altering their school year as a means of meeting more effectively the problems facing them: a shortage of classrooms; an inadequate supply of qualified teachers; an awareness that in today's world of greatly expanded knowledge, the conventional nine-month school year does not allow enough time to maintain quality education; and a grave concern about the rising cost of educating an increasing school population.

This chapter examines the efforts of selected communities which have studied or experimented with various plans in their attempt to meet these problems. Although this discussion is limited to plans which aim to make maximum utilization of the school plant, brief mention is made here (see Appendix A for detailed information) of the following approaches which generally call for an extension of the school year:

1. Enriched summer school plan provides for voluntary programs of 6-12 weeks during the summer, following the traditional 9-10 month school year. This plan is currently the most popular of the various proposals to extend the school year. In 1961, out of 34 state officials who responded, 32 indicated that summer enrichment programs were provided in their states.[1]

2. Extended pupil school year plan provides for a compulsory school year of approximately 11 months by adding 30-40 days to the present 180-day school year.

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[1]Gloria Cammorata, et al., "Summer Programs for Students and Teachers", Education Digest 27 (November 1961), p. 26.

Advocates of this plan argue that the present academic year is too short and that it must be lengthened to give teachers and students the necessary time to study both historical developments and current problems in the various subject areas. Although many educators favor this plan, there is no evidence of its operation in any school system.

3. Extended professional school year plan provides selected teachers an opportunity to be hired and paid for 12 instead of 10 months of work. During the extra two months, teachers are expected to: (a) participate in local workshops, curriculum development committees, textbook selection committees; (b) teach summer school or supervise some other summer program for students (who enroll on a voluntary basis); (c) study for credits at a university; or (d) go on approved travel. Teachers are expected to engage in most of these activities on a rotation basis within a specified period of time. While there is recognition of the values of offering teachers the chance to improve themselves professionally, the cost factor has made it difficult for most school systems to adopt this plan. The following are among the school systems currently on the extended professional school year: Glencoe and Decatur, Illinois; Montgomery, Maryland; Centerline, Michigan; Rochester, Minnesota; and Beaumont, Texas.

In contrast to the above are plans which provide for a maximum utilization of the school plant, personnel, and instructional materials. Two approaches differing somewhat in objectives are presented in this chapter: (a) the four-quarter rotation plan and (b) the four-quarter voluntary plan.

Four-Quarter Rotation Plan

Advocates of this plan indicate that existing school buildings, properly used, can enroll more students without a proportionate increase in the need for teachers. This plan calls for year-round use of the buildings, but a rotation system for students, so that more pupils can be accommodated.[2]

Brief Description

The principal features of the four-quarter rotation plan are: (a) the school year of 12 months is divided into four terms; (b) the student body is divided into four equal groups; (c) students attend school for three quarters and are on vacation for one quarter (180 school days for each student); (d) vacations are staggered so that during any one quarter 3/4 of the students are in school and 1/4 are on vacation; (e) teachers may or may not teach the fourth quarter, but those who do receive extra compensation; (f) students may attend all four quarters only in rare cases, i.e., the highly gifted who will benefit from acceleration. This last characteristic is essential to maintain equalized attendance during all four quarters.

Under this plan, schools will theoretically be able to accommodate 25 to 33-1/3 per cent more students, reduce the number of teachers required by this increase by 25 per cent, and save about 25 per cent on capital outlay. Proponents further point out that the quality of education is not sacrificed since students will be taught by qualified teachers and the school year will not be shortened.

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[2]See the Tucson Citizens' Committee Report, The Year Round School (Mimeographed; n. d.), for details of the five-term plan which is a variation of the four-quarter rotation plan.

Historical Background

The idea of the four-quarter rotation system is not new in the United States. Pioneering efforts were undertaken in Bluffton, Indiana, from 1904 to 1915. In the 1920's, more than one dozen school systems experimented with this plan. By the 1930's, this number was reduced to six; by 1950 only one (Chattanooga, Tennessee); and by 1956, no school was operating on the four-quarter rotation plan.[3]

The Aliquippa program is one of the best known of these experiments. Available reports are comprised largely of opinions and recollections of those who were familiar with this program. Unfortunately, there are few reliable evaluative reports based on objective data.

In the late 1920's, Aliquippa started the four-quarter rotation plan from economic necessity. The location of a steel plant had brought a sudden increase in the population and a corresponding increase in school enrollment from 2,200 to 6,600. The four-quarter rotation plan was put into effect when the enrollment had reached 6,600.

From the standpoint of economy, the program was considered successful. It produced a savings of $40,000 annually.[4] H. R. Vanderslice, one of the superintendents of the Aliquippa Schools during this period, reported that

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[3]National Education Association, Research Division, The All-Year School, Research Memo, 1962-2 (Washington, D. C.: the Association, January, 1962), p. 3.

Among the school systems which adopted and then discontinued the four-quarter rotation plan are: Bluffton and Gary, Indiana; Mason City, Iowa; Eveleth, Minnesota; Omaha, Nebraska; Newark, New Jersey; Ambridge and Aliquippa, Pennsylvania; Chattanooga, Tennessee; and El Paso and Amarillo, Texas.

[4]Minnesota, Department of Education, A Longer School Year; All-Year School and Other Plans to Extend the School Year, Research Project No. 12 (Mimeographed; 1958), p. 7.

during a seven-year period, there were savings of: (a) $282,059 covering such items as capital outlay, debt services, and other related expenses and (b) $96,880 on teachers' salaries. The latter resulted from a 5 per cent reduction in teacher salaries--made possible partly because most of the teachers desired to work for the full 12 months.[5]

Aliquippa was fortunate since it was not confronted with or was able to solve satisfactorily some of the more common problems disturbing other systems using this plan, such as increased transportation costs, assimilating the transferring student, participation in athletics during vacation periods, and the difficulty of studying during the summer. Since all of the students lived within a 1-1/2 mile radius from school, there were no transportation costs. Similarly, since there were only a few transferring students, the necessity for credit examination was minimal. Special arrangements were made to allow vacationing pupils to participate in athletic events.[6] Officials solved the problem of summer heat by dismissing school when the temperature rose to 90 degrees--a rare occasion. No marked absenteeism during the summer months was noted.[7] Vanderslice maintained that there was no drop in achievement during the summer months. Unfortunately, objective data could not be located to support

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[5] National Education Association, Research Division, op. cit., p. 3.

[6] Citizens' Committee of the Sequoia Union High School District, The Four Quarter Plan and Other Methods of High School Plant Utilization (Redwood City, California: 1960), p. 18.

[7] Minnesota, Department of Education, op. cit., p. 7.

the claims of advantages or benefits under the program.[8]

Vanderslice also reported that the two biggest difficulties were parental pressure for vacation preferences and the great increase in administrative problems.[9] He felt, however, that the latter was not insurmountable.

Aliquippa discontinued the program in the late 1930's when the need for it diminished. The steel plant reduced production and released many workers who then took their families to other localities.

Evaluation

The four-quarter plan needs to be evaluated in terms of its effects on students, teachers, administrators, and the economy.

Effect on Students--If the four-quarter rotation system allows it, the gifted may be accelerated and complete elementary and secondary education in 10 years, while the slow learner may use the fourth quarter to overcome his weaknesses.

Another advantage for older students under the four-quarter rotation plan is the possibility of more work opportunities. Industry and business may be better able to hire 1/4 of the students on a year-round basis rather than all of them during the summer months.[10] Staggered vacations may also be ideal for some students whose families are given vacations other than during the summer months.

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[8]L. S. Wilson, who was at one time principal and later superintendent of Aliquippa during this period, felt that insufficient data made it impossible to make conclusive statements on the point of student achievement. (Ibid.)

[9]Supt. L. S. Wilson found the parents rather cooperative with only 5 per cent requesting specific vacation periods.

[10]Citizens' Committee of the Sequoia Union High School District, op. cit., p. 87.

Critics point to a number of disadvantages. The necessity to equalize attendance makes it mandatory that only in rare cases would a gifted child or a slow learner be allowed to remain in school for all four quarters. With school being reorganized every 12 weeks, considerable loss of instructional time is envisioned. With a smaller student enrollment, it is difficult to schedule certain select academic courses such as trigonometry, foreign languages, and physics.

Various extra-curricular activities may also be adversely affected by this plan. Coordinating and organizing these activities with one-fourth of the students on vacation would be difficult. Vacationing students may be deprived of the opportunity of participating, actively or passively, in these events. Participation in certain community projects may also be ruled out for some students whose vacations were not scheduled at the "right" time; e.g., summer camps. The cooperation of community agencies should be sought so that their activities could be planned to accommodate students on a year-round basis.

A serious consideration especially for communities with a high degree of mobility is the problem of the transferring student.[11] Unless his transfer takes place at a certain time, he might have to wait for some time before enrolling in the assigned quarter. Furthermore, the school might not be able to place the student so as to provide an uninterrupted sequence in courses such as foreign language. The student also faces the problem of credit evaluation since systems under the semester plan and systems under the four-quarter plan may have different

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[11]The school may decide to handle the student transfer as an exception as far as admission regulations are concerned, but this might be difficult if there is a desire to equalize attendance.

criteria for granting credits.

Effect on Teachers--The most obvious advantage for teachers who work the full 12 months is an increase in salary. A lower pupil load may result under the four-quarter plan since students theoretically are divided into four equal groups.

Offsetting the above advantages, however, is the increase in the teachers' work load: organization of more classes within the school year, more grading periods, and a larger number of students to know. A smaller school enrollment often makes it necessary for teachers to teach a greater variety of subjects. A twelve-month calendar deprives teachers of their traditional "self-improvement" periods. Other arrangements to provide for this basic need of the teaching profession should be made if effective teaching is not to be sacrificed.

Effect on School Administration--The four-quarter plan greatly increases the responsibilities and problems of the administrator. With four admission dates and four graduations, the administrator is in effect handling four small schools instead of one large one. This means that his organizational problems are multiplied.

There must be close cooperation among the elementary, secondary, and college administrators. Agreement should be reached on areas such as necessary curriculum changes, credit valuation, and admission and graduation dates. The basis for admission should also be determined.

The most demanding problems, however, will probably center around vacations. Parents and teachers may demand exceptions to the scheduled vacation. Further aggravating the situation is that the vacation sequence is constant; i.e., once assigned to a winter vacation, the student must always be on that schedule. Furthermore, during some quarter, the administrator himself will be on vacation while the rest of the school is in operation.

Effect on the Economy--Theoretically, the four-quarter rotation plan saves the public about 25 per cent in capital outlay since the existing buildings are used to accommodate 25 to 33-1/3 per cent more students.[12] Debt service and insurance costs are also reduced.

However, some critics indicate that whatever is saved in capital outlay is offset by an increase in other expenses under the four-quarter plan. Teachers and administrators, as well as other non-professional employees on 10-month contracts, must all be paid for the extra two months of work. Additional clerical and administrative personnel may be necessary to cope with the greatly increased responsibilities of the administrator. Maintenance costs especially become more expensive since most of the work must be done at night and during week-ends when workers must be paid over-time rates. Having to run the school buses for 12 months also means additional expenses in terms of drivers' salaries and bus maintenance.

Summary of Current Status

Although no school is currently operating under the four-quarter rotation plan, present day needs and demands have renewed interest in maximum utilization plans. Various communities and state departments of education have recently made extensive studies.

The status of the four-quarter rotation plan has been summarized as follows: "With respect to the experience with and study of the four-quarter system, two important facts stand out: (1) communities that have tried the plan have abandoned it; (2) communities that have investigated the plan have rejected it."[13]

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[12]Savings are not always the result of adopting a four-quarter plan. Atlanta indicated in a 1957 study that it was more economical to build than to adopt the four-quarter plan.

[13]Minnesota, Department of Education, op. cit., p. 4.

Four-Quarter Voluntary Plan

The experience of Newark, New Jersey, illustrates this plan. Newark tried a four-quarter program from 1912-1931 for educational, rather than economic, reasons. Through this program, Newark hoped: (a) to enable students to complete the elementary curriculum in six, instead of eight, years; (b) to reduce the waste of time produced by prolonged summer vacations; (c) to prove that summer studies did not impair students' health; and (d) to meet the individuals' educational needs (acceleration for some, prolonged review for others).[14]

Under the Newark program, the school year of 12 months was divided into four terms. A continuous four-quarter attendance was possible for all on a voluntary basis. (Summer enrollment reached as high as 75 per cent of the student body.) Acceleration was also permitted. Teachers who taught on a 12-month basis received extra compensation for the two summer months and in addition were given a 5 per cent bonus.

One evaluation of the Newark plan indicated that although the Newark schools were not able to achieve the degree of student acceleration deemed desirable, the plan was nevertheless helpful to students. It was pointed out that since most of the students came from areas heavily populated with immigrants and with generally poor home conditions, the elementary school program would have taken them 9-10 years to complete if it were not for this special 12-month plan.[15]

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[14] U. S. Office of Education, "The All-Year School", by Grace S. Wright, Circular No. 470 (Revised; May 1958), p. 2.

[15] This evaluation was conducted in 1925 by Dr. Wilson Farrand and Professor M. V. O'Shea and discussed in: Citizens' Committee of the Sequoia Union High School District, op. cit., p. 19.

Newark dropped the plan in 1931 because: (a) it was too costly; and (b) its purported educational advantages were doubtful. The latter reason was based on the observation that students were often accelerated to their disadvantage: they were graduating at too young an age to obtain employment and were often too immature for college work.[16]

Recent Studies

In recent years, the four-quarter rotation plan has been studied by several school districts in various parts of the country.[17] Some of these studies have reviewed

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[16]Wright, op. cit., p. 3.

[17]The following communities have studied and reported on the four-quarter rotation plan. Citations in full indicate studies available at the Legislative Reference Bureau.

a. Arizona, Tucson, Report, Year-Round School Committee (Mimeographed; n.d.), 50 pp.

b. California, Contra Costa County Taxpayers' Association, The All-Year School: A Critical Review, Research Bulletin No. 18 (Mimeographed; 1956), 16 pp.

c. California, Long Beach Public Schools.

d. California, Los Angeles City School Districts, The All-Year School, A Report by the Committee to Study the All-Year School (Mimeographed; July, 1954), 85 pp.

e. California, Redwood City, The Four-Quarter Plan and Other Methods of High School Plant Utilization, A Study by a Citizens' Committee of the Sequoia Union High School District (Redwood City, California: Sequoia Union High School District, 1960), 111 pp.

f. California, Sacramento Unified District.

g. California, San Mateo County.

h. Connecticut, Fairfield.

i. Florida, State Department of Education, A Study of the Advantages and Disadvantages of the Twelve-Months Plan for the Operation of the Public Schools of Florida (Tallahassee, Florida: State Department of Education, April, 1957), 13 pp.

j. Illinois, Urbana, A Research Study by the Faculty of Lincoln-Thornburn Schools, The All-Year School (Mimeographed; May, 1959), 8 pp.

the literature; others have gone beyond this to explore the feasibility of the plan in that particular school district. A study made in 1952 by citizens of Fairfield, Connecticut, analyzed the cost factor. A $5,000,000 building program was needed, costing citizens $368,750 yearly for interest, amortization, operation and maintenance for 40 years. On the other hand, the four-quarter rotation plan, including air conditioning expenses, would cost $81,900 yearly, resulting in a saving of $286,850 annually for the period when building costs were being paid. In spite of the projected savings, Fairfield voted against adopting the rotation plan, feeling that disadvantages outweighed whatever economic gains might be realized.

Both the Los Angeles and Florida studies indicated that administrative problems and public resistance were obstacles too great to offset the advantages of the four-quarter plan. The Los Angeles study refers to inertia as one of the major problems: "...inertia of the community--its resistance to such a drastic change, involving, as it does, major readjustments for pupils, teachers, and parents. If the schools were self-sufficient, and independent of the community in which they exist, fewer problems would arise. The very fact that the schools are an integral part of the social, business and industrial community means that they cannot deviate, in their

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k. Maryland, Montgomery County.

l. Minnesota, Department of Education, A Longer School Year: All-Year School -- and Other Plans to Extend the School Year, Research Project No. 12 (Mimeographed; 1958), 17 pp.

m. Ohio, Cincinnati Public Schools, Department of Research, Statistics and Information, A Brief Inquiry into the Four-Quarter School (Mimeographed; March 11, 1957), 7 pp.

n. South Carolina, State Department of Education.

o. Texas, Dallas.

p. Texas, Houston.

operation, from the trends and practices established by the larger order...."[18]

Some of the recent studies have also considered the effect of population density on the plan. A variation in population density within any school district further complicates the problem. While the plan would be of some benefit to the more populous areas by relieving the building problem and reducing the need for double sessions, there would be no benefits to the less densely populated areas.

The Florida study analyzed the problem of population density and arrived at some conclusions.[19] Since the four-quarter rotation system is theoretically dividing the school into four schools because each grade must be divided into four sections, a minimum population is desirable for effective operation of the plan. An elementary school should have a current enrollment of at least 720 students with 24 teachers to make possible four elementary schools with one teacher to each grade.[20] This would enable one teacher to handle one class of 30 students. A smaller enrollment with fewer teachers would mean that to maintain the teacher-pupil ratio of 1-30, a teacher would have to teach two or three grades at a time. This might reduce his effectiveness.

On the junior high level, the Florida study points out that a current enrollment of 1,500 students with 50 teachers is necessary before the school can be divided into four sections with at least 12 teachers. Since junior high schools are departmentalized, they must be

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[18]California, Los Angeles City School Districts, op. cit., p. 72.

[19]Florida, State Department of Education, op. cit., pp. 5-6.

[20]This might be reduced if the school has "ungraded" classes, such as the "ungraded primary" plan.

large enough to offer a variety of subjects; a faculty of 12 is considered the minimum for each grade level. The greater departmentalization on the senior high school level and the need to offer a greater variety of subjects in all areas make necessary a staff of at least 20 to maintain a minimum program. To make the four-quarter plan possible, therefore, a senior high school should have at least 80 teachers with 2,400 students.

Considerations in Redesigning the School Year

Any significant change in the design of the school year should be based on a consideration of the many effects such a change would have on students, teachers, administrators, and the community. No one factor, such as economy, should be used as the sole purpose for a new design. Neither should any factor be considered which does not contribute to quality education. Although most of the generalizations included in this section have been implied in the previous discussion, a brief recapitulation may be helpful.

Effect on Students

Since the primary aim of the American school system is the intellectual and emotional growth of pupils, any plan that may impede or prevent this development should be seriously questioned. Among the areas which should be considered in attempting to meet the students' intellectual needs are the following: minimum number of school days, type of enrichment opportunities, nature of curriculum offerings, provisions for individual differences.

The emotional health of students deserves attention. Students should be able to participate actively or passively in various events and projects designed to meet their emotional and social needs--family projects and

vacations; school activities such as athletics, debates, music festivals, student government, and clubs; church activities; and other community sponsored programs. The physical health of the students should likewise receive consideration.

Another factor, especially in communities with a high degree of mobility, is the effect of the contemplated change on the transferring student. Such a student is already faced with problems of personal and academic adjustment and should not be confronted with problems regarding the transfer of credits or the necessity to "wait" for a length of time for the "right" admission date (as may happen in a four-quarter rotation system), if equalized attendance is to be maintained.

Effect on Teachers

The morale and professional standing of the teacher should be an important consideration in any effort to redesign the school program. In practice this means that the teacher's economic status as well as his position as a professional person should not be adversely affected.

The nature of the teaching profession requires its members to continue to have the opportunity for periodic professional improvement through participation in conferences, workshops, university courses, and travel. An undue increase in the non-teaching and teaching responsibilities of teachers may have demoralizing effects. They should have reasonable student loads and should be assigned to teach in their fields of preparation.

Effect on School Administration

It is obvious that administrative problems are inherent in any attempt to change the school year. The four-quarter rotation plan, for example, has problems centering around: (a) scheduling admission and vacation periods for pupils and teachers; (b) programming various technical courses for a smaller group of students;

(c) recruiting new teachers; (d) offsetting the loss of instructional time resulting from frequent reorganization of the school year; (e) revising the curriculum; (f) securing agreement among elementary, secondary and college officials on pertinent areas; and (g) coordinating the school year with the calendars of events of other community agencies.

Effect on the Economy

In assessing the contemplated economic benefits of any plan, it is necessary to know the extent of financial savings and expenditures accruing from: (a) capital outlay for buildings--including interest, amortization, insurance; (b) texts, equipment, and other instructional materials; (c) operational expenses; and (d) maintenance expenses. As has been indicated earlier, a savings in one area may be offset by substantial expenditures in another.

Effect on the Public

A final and important consideration is public reaction to the contemplated change. The schools are an integral part of and a reflection of the larger community, and community support is necessary in order for a new endeavor to be successful. The public, however, has tended to be slow in accepting any marked changes in the traditional patterns of school organization.

Chapter III

FEASIBILITY OF THE FOUR-QUARTER ROTATION PLAN FOR HAWAII'S PUBLIC SCHOOLS

Hawaii will experience a rise in pupil enrollment, but this general increase will not be evenly distributed throughout the State. Recent estimates indicate that by 1966-67, each of the Neighbor Islands will show an annual decrease in pupil enrollment, while Oahu will be faced with an increase.[1] The data in Table 1 show that school enrollments in 1966-67, as compared to those in 1961-62, will rise by 10.9 per cent for the State, will decrease by 10.5 per cent on the Neighbor Islands, and will increase by 17.4 per cent on Oahu. Moreover, the department of education reports that the increase on Oahu will take place in the rural areas.

An expanding school population generally requires a proportionate expansion of the teaching staff, as well as of other professional and nonprofessional employees, if present services are to be maintained. This means that by 1966-67, the department of education will need approximately 10.9 per cent more teachers, or about 548 in addition to (without providing for replacements) the 5,033 teachers hired by the department in 1961-62. The department will also need proportionately more librarians, counselors, health co-ordinators, and, if new schools are established, more vice-principals and principals.

A growing pupil membership also means an inevitable increase in school construction, if present conditions of school utilization are maintained. The department's

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[1]Hawaii, Department of Education, Research and Statistics Branch, "Statistics on Pupil Membership", Public School Statistical Series, Circular #6 (April 1962), pp. 8-10.

estimate for capital improvement projects for the period 1962-1968, including new and proposed construction, totals $41,381,000 for rural Oahu alone.[2]

Table 1

ESTIMATES OF PUPIL MEMBERSHIP
IN HAWAII'S PUBLIC SCHOOLS
1962-63 THROUGH 1966-67*

Year	Islands				State Totals
	Hawaii	Kauai	Maui	Oahu	
1961-62**	17,185	6,702	10,977	114,690	149,554
1962-63**	17,243	6,890	11,013	118,152	153,298
1963-64	16,560	6,498	10,471	123,485	157,014
1964-65	16,177	6,411	10,311	127,301	160,200
1965-66	15,710	6,264	10,070	130,827	162,866
1966-67	15,232	6,128	9,857	134,609	165,826

Source: Hawaii, Department of Education, Research and Statistics Branch, "Statistics on Pupil Membership", Public School Statistical Series, Circular #6 (April 1962), pp. 8-10.

*A subsequent publication of the department of education gives slightly lower estimates of enrollment for Oahu and slightly higher estimates of enrollment for the Neighbor Islands than those which were available at the time the legislative reference bureau undertook its study.

**Figures for 1961-63 are actual enrollments; the remaining data are estimates.

[2]Hawaii, Department of Education, School Facilities Branch.

General Background

In view of the above circumstances, legislative interest in the feasibility of the four-quarter rotation plan for Hawaii's public schools seems especially pertinent for rural Oahu.

The feasibility of any plan can be explored in several ways. For example, the four-quarter rotation plan could have been applied to the entire public education system in Hawaii, but this would have meant that the values of such a plan would be minimal for the Neighbor Islands. The legislative reference bureau decided instead to apply the plan under nearly ideal conditions--i.e., to a school which (a) will experience a rather large increase in enrollment and (b) is large enough to minimize difficulties in course and teacher scheduling. By approaching feasibility in this manner, the bureau hopes to illustrate basic changes which will need to be made and to define problems which exist even under favorable conditions. Following a detailed analysis of the effects of the plan on the school, there is a brief discussion of the implications of the four-quarter rotation plan for the total educational enterprise.

Selection of a High School

In addition to the above criteria, it was decided to choose a high school for the feasibility study since course scheduling would be more complicated on the secondary, than on the elementary, level.

In selecting a high school for illustrative purposes, special effort was made to identify one with a high enrollment and a sizable predicted pupil growth between 1962-66. Kailua High School, a four-year secondary school, was chosen primarily because its 1965-66 enrollment is expected to be about 20 per cent above that of 1962-63. The inadequacy of the present plant is already

being felt: in 1963-64, about one-half of the freshman class will remain at Kailua Intermediate School for ninth grade work.

Statutory and Administrative Considerations

Proponents of any change in the school calendar should consider the plan in relation to relevant statutory and regulatory provisions. The department of education is authorized by the legislature to set the minimum school year (Sec. 40-1, Revised Laws of Hawaii 1955), and does so by setting the minimum school days per year as 180. The department also provides that the school day for high school students should be a minimum of 6-1/2 hours; for high school teachers, 35 hours per week or a 7 hour gross average day. Approximately 11 days (12 during election years) are designated as legal holidays during the calendar year. In addition, there are 14 "traditional" holidays for the schools--the day after Thanksgiving, 8 days at Christmas, 4 at Easter, and 1 teachers' meeting day.

Besides these provisions, which relate to time, are those which govern the professional aspects of teaching; i.e., sabbatical leaves, teaching assignments, and in-service training. The adoption of the four-quarter rotation plan would necessitate study and possible modifications in these areas.

Selected Characteristics of the Plan

The general features of the four-quarter rotation plan were presented in the previous chapter, but additional details are necessary. The following characteristics were rather arbitrarily determined by the legislative reference bureau and the department of education on the basis of present regulations and desirable professional practices. These features do not

provide for all the changes which will be necessary, but make possible a hypothetical application of the four-quarter rotation plan.

School Calendar

The school year, commencing July 1 and ending on June 30, will be divided into four quarters of approximately 60 days each. Students will attend three of the four quarters for a total of 180 school days. Such a calendar necessitates the elimination of long periods when the entire school will be closed and requires the following changes: (a) Christmas vacation, including the week-end, will be about 10 days long; (b) only Good Friday will be a holiday while the week-long Easter vacation is eliminated; (c) Teachers' Institute Day will be eliminated as a holiday; and (d) one day between quarters will be allotted as a "quarter break" to allow for necessary adjustments. A school calendar with the above features is presented in Table 2.

Student Assignments

Students will be divided into four approximately equal groups, alphabetically, according to their surnames. This may minimize the possibility of conflicting vacation periods for children of the same family. Exceptions to this rule will be kept at a minimum; i.e., in rare cases, the extremely gifted student will be allowed to attend school during all four quarters for acceleration purposes. Restricting exceptions will help to maintain approximately equal enrollments each quarter so as to allow the maximum utilization of the school plant.

Students will be placed in Groups A, B, C, and D and will attend school in accordance with the provisions outlined in Table 3. Under this schedule, Groups A, C, and D commence school on July 1, while Group B starts on September 27. Group A completes the year's work on April 2; Groups B, C, and D on June 30. This schedule

Table 2

SCHOOL CALENDAR UNDER THE FOUR-QUARTER ROTATION PLAN
JULY 1, 1963-JUNE 30, 1964

Week	Date	Days of School
	Quarter I	
1	July 1-3,5(4-H)*	4
2	8-12	5
3	15-19	5
4	22-26	5
5	29-Aug. 2	5
6	Aug. 5-9	5
7	12-16	5
8	19-23	5
9	26-30	5
10	Sept. 3-6(2-H)	4
11	9-13	5
12	16-20	5
13	23-25	3
	26(1 day break)	
		61
	Quarter II	
	Sept. 27	1
14	30-Oct. 4	5
15	Oct. 7-11	5
16	14-18	5
17	21-25	5
18	28-Nov. 1	5
19	Nov. 4-8	5
20	12-15(11-H)	4
21	18-22	5
22	25-27(28,29-H)	3
23	Dec. 2-6	5
24	9-13	5
25	16-20	5
26	23,24(25-27-H)	2
27	(30-Jan.3-H) (1 day break included)	
		60
	Quarter III	
28	Jan. 6-10	5
29	13-17	5
30	20-24	5
31	27-31	5
32	Feb. 3-7	5
33	10-14	5
34	17-20(21-H)	4
35	24-28	5
36	Mar. 2-6	5
37	9-13	5
38	16-20	5
39	23-25(26,27-H)	3
40	30,31, Apr. 1,2 Apr. 3(1 day break)	4
		61
	Quarter IV	
41	Apr. 6-10	5
42	13-17	5
43	20-24	5
44	27-May 1	5
45	May 4-8	5
46	11-15	5
47	18-22	5
48	25-28(29-H)	4
49	June 1-5	5
50	8-10,12(11-H)	4
51	15-19	5
52	22-26	5
	29	1
	30(1 day break)	
		59

*"H" means legal holiday.

Table 3

STUDENT ASSIGNMENTS UNDER
THE FOUR-QUARTER ROTATION PLAN
JULY 1, 1963-JUNE 30, 1964

Note: This scheduling of students is based on the "Spangler Plan".

Group	Quarter I	II	III	IV
A	School	School	School	Vacation
B	Vacation	School	School	School
C	School	Vacation	School	School
D	School	School	Vacation	School

Source: Citizens' Committee of the Sequoia Union High School District, The Four Quarter Plan and Other Methods of High School Plant Utilization (Redwood City, California: the Committee, 1960), p. 31.

provides for basically two admission dates and one graduation date.[3]

Teaching Assignments and Salaries

On the theory that teachers need some time away from students to relax from the strains of teaching and to pursue some professional improvement activities, teachers will be allowed to teach no more than 10 quarters every three years. In short, teachers may teach the fourth quarter once every three years.[4]

The contract of all teachers, while covering the academic year from July 1 to June 30, will stipulate the number of quarters each teacher is assigned to work: 180 days for 3 quarters of teaching or 240 days for 4

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[3]Another schedule with four admission and graduation dates is oftentimes proposed by advocates of the four-quarter rotation plan.

That schedule offers the possibility of nine uninterrupted months of school for all groups, as indicated below:

	1st Year				2nd Year			
	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q
Group A	Sch	Sch	Sch	Vac	Sch	Sch	Sch	Vac
Group B	Vac	Sch	Sch	Sch	Vac	Sch	Sch	Sch
Group C	Vac	Vac	Sch	Sch	Sch	Vac	Sch	Sch
Group D	Vac	Vac	Vac	Sch	Sch	Sch	Vac	Sch

Among the disadvantages of this schedule are the following: (a) since each of the four groups starts school at different times of the year, four different schedulings of classes, four registrations, and four graduations will be necessary although each student registers only once a year; (b) in the initial, transitional year, some students may be kept out of school for as long as nine months and attendance will not be equalized in the four quarters until the second year.

[4]It is conceivable, however, that if a serious shortage of teachers exists, a revision in this policy can be made to allow teachers to teach more quarters than specified. Whether or not teachers will be willing or have the stamina to work all four quarters for extended periods is not known.

quarters of teaching. The annual salary will be paid in 12 equal installments. The extra compensation for the fourth quarter of teaching will be one-third of the salary for the academic year, composed of three quarters. For example, if a teacher's annual salary is $4,800 for three quarters' work, he will be paid an additional $1,600 for the extra quarter of teaching.

Non-Teaching Personnel Assignments

Secretaries, clerks, custodians, and cafeteria helpers are presently hired under the civil service system on a 12-month schedule with 21 days of vacation annually. The four-quarter rotation plan, therefore, will not necessitate any salary readjustments for these personnel. However, their present work load will increase inasmuch as the plan does call for more clerical work (greater number of registration dates, more checking and rechecking of records, filing, etc.) and perhaps more custodial assistance since buildings will be more fully utilized. Consequently, additional non-teaching personnel may be necessary or the services of present employees should be better utilized to meet the new demands.

Cafeteria managers, like teachers, may work for 10 out of 12 quarters during each three-year period.[5] They will receive additional compensation for the extra quarter of work on the same basis as teachers, and will be replaced during their two vacation quarters.

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[5]The law presently provides that cafeteria managers shall be employed under civil service and paid in twelve installments, but shall be given the same vacation privileges as teachers and principals (Revised Laws of Hawaii 1955, as amended, sec. 38-37). The feasibility should be explored of granting cafeteria managers (as are cafeteria workers) vacation privileges under civil service.

Administrative Staffing Services

If present standards and services to students in such areas as counseling and health services are to be maintained and if the complexities of the four-quarter rotation plan are to be met efficiently, it seems desirable not to reduce the present administrative staff. Enlargement of the present staff may be needed to cope with the additional problems inherent in the proposed change, especially during the transition period even though the average daily attendance might be lowered. This will require a change in present administrative staffing formulas.

Like teachers, those in the administrative staff will be allowed to work 10 quarters in every three-year period. In order to maintain a full staff each quarter, qualified replacements for the personnel on vacation will be provided each quarter. The principal will be replaced by his vice-principal who will receive the principal's salary for that quarter. A "floating" vice-principal, assigned to the area (e.g., Kailua) will then take the vice-principal's place in that school. Similar "floaters" will replace the counselors, the librarians, the registrars, and health co-ordinators.[6]

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[6]An alternative to this plan is to place these administrative personnel under a 12-month civil service schedule with 21 vacation days per year. The problem of replacements would not be so crucial. However, the proposed plan was chosen since it is consistent with the philosophy of the department of education which regards these positions as leadership-training opportunities. Therefore, the practice of having the vice-principal assume the principal's office for a limited period would constitute a valuable training period.

Whether "floaters" in counseling will be successful is a matter of some concern. It may be possible to assign counselors to groups of students--i.e., one would be assigned to group A and would be on duty whenever that group was in school.

Course Scheduling

Present curriculum offerings shall be maintained and made available to all four groups. No one group shall be deprived of the opportunity of taking a course because it happened to be offered during that group's vacation period.

This does not mean, however, that all courses shall be offered every quarter. Where possible and feasible, present one-semester courses with limited enrollment (such as trigonometry) may be converted under the four-quarter rotation plan to one-quarter double-period courses. Such courses may be offered during alternating quarters or every third or fourth quarter depending upon the need. The principal guide in scheduling is to give all groups the opportunity to take various courses in their proper sequence.

Hypothetical Application of the Plan

Kailua High School presently is a four-year high school with a student body of 2,668 and a staff of 83 teachers.

For 1966-67, the enrollment has been estimated at 3,307 during each of the two semesters. If the present calendar is continued and if present staffing ratios are maintained, Kailua will be assigned 104 teachers. If the four-quarter rotation plan is adopted, there will be in each of the four quarters (a) an enrollment of 2,480 students and (b) a need for 78 teachers.

The four-quarter rotation plan will be applied to Kailua in the 1963-64 school year by considering basic changes which will be necessary and problems which need to be resolved in the following areas: curriculum offerings, teacher scheduling, student activities, and state

administrative practices.[7] In addition, cost estimates for 1966-67, developed by the department of education, are included.

Curriculum Offerings

The effective implementation of the curriculum is at the core of any successful educational attempt. Under the four-quarter rotation plan, it is essential that the curriculum be (a) well-organized, for some students will complete a year's course work under two or three teachers and (b) reorganized by converting two-semester courses into three-quarter courses. The reorganization of some one-semester courses (e.g., creative writing) may also be necessary--either into a double-period course for one quarter or a single-period course for two quarters. Furthermore, curricular offerings for each of the four groups of students should be as rich and varied as those scheduled under the present calendar. The scheduling of courses, therefore, becomes a task of paramount importance.

Present Course and Teacher Scheduling--Kailua presently offers 105 courses, including the required courses in basic subjects such as English, social studies, physical education, mathematics, and science, as well as elective courses in such fields as foreign languages, speech, drama, home economics, music, industrial arts, art, agriculture, business and commerce, photography, creative writing, and journalism. Of the 105 courses, the great majority are electives since students are required to take four specified courses in English, four specified courses in the social sciences, two specified courses in physical education, and two required electives in both math and science.

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[7] 1963-64 was chosen because predicted enrollments for each of the four grades were available.

A further analysis of the electives scheduled for the current year indicates that there are 44 single-section courses (e.g., one section in boys' cooking, business law), 22 courses for which two sections have been scheduled, and 8 courses for which there are three sections. Four or more sections have been scheduled for other electives and required courses.

A study of teacher assignments shows that 70 teachers are instructing in their areas of certification. Of these, 31 are assigned to teach five or six classes in one general area only (e.g., 6 classes of civics, 5 classes of English 1-2); 20 in two areas of the same subject (e.g., geometry and algebra 3-4, physics and physical science); 16 in three related subjects (e.g., arithmetic 1-2, geometry, algebra 3-4); and three in four or five related subjects. Although it is generally recognized that the teacher, instructing in his specialized areas and having to make few basic preparations, has a better opportunity to perform more effectively, it is difficult to say what the maximum number of preparations should be.

Another aspect of teacher assignment needs brief mention: qualified teachers in certain highly specialized courses, such as physics, UICSM (University of Illinois Committee to Study Mathematics--commonly called Illinois Math), and foreign languages, are limited in number. There is usually only one "specialist" for each of these subjects in the school and these persons are said to occupy "one-line" positions. Ordinarily, it is difficult to find replacements for these personnel.

Scheduling Under the Four-Quarter Rotation Plan--Converting the two-semester curriculum offerings into a four-quarter rotation schedule and providing each group with the opportunity of taking these courses presented problems of varying degrees of difficulty. Scheduling

the required courses in English and social studies on a four-quarter rotation plan was not as difficult as scheduling some of the elective courses. For illustrative purposes, scheduling was attempted for the required ninth-grade English (English 1-2) course and the course in algebra 1-2. These schedules are found in Appendixes B and C, respectively.

The data in Appendix B indicate that:

1. Under the present calendar, 24 sections of ninth-grade English will be necessary to provide for the predicted 758 ninth graders in 1963-64, and that 5 teachers (four full-time and one with one other elective), instructing for five periods daily, will be needed. Furthermore, all students will probably complete their year's work under one teacher.
2. Under the four-quarter rotation plan, 18 sections will be necessary each quarter to provide for the estimated 570 students (3/4 of 758) with some variation in the sequences needed in the second and third quarters. Four teachers, with only one instructing for four quarters, will be needed. In each quarter, there is at least one teacher who either teaches other electives or who has more than one preparation in English. Slightly more than 3/4 of the students (19 sections out of 24) will be able to complete their year's work under one teacher; the remaining will have two teachers.

While the present calendar has the advantage of providing teachers with fewer preparations and students with the opportunity to work with one teacher during the year, the four-quarter rotation plan utilizes fewer teachers at any one time, while providing instruction for as many students over a longer period of time.

The scheduling of elective courses which have many sections presents similar problems to those for required courses. For example, Appendix C, illustrates two ways in which algebra 1-2 may be scheduled under the four-quarter rotation plan:

1. By assigning two teachers four quarters of work in such a way as to have (a) each responsible for the year's work in algebra for two groups of students and (b) each having to prepare lessons almost solely in this subject, or
2. By assigning three teachers three quarters of work, (a) three groups will be able to complete the year's work under one teacher, and (b) all teachers will have to teach other subjects besides beginning algebra.

The most difficult problems in scheduling arise in providing for courses for which there are few sections or only one section or for which limited teaching personnel are available. For example, the course in Illinois Math (presently enrolling 17 students) needs special consideration. At least three alternatives exist: (a) discontinue the program; (b) make an exception in grouping students, so that all those in Illinois Math are placed in the same group; (c) offer the course each quarter. A possible variation of the last alternative is to change these courses from single-period to double-period courses, making it necessary to offer the course in only two of the four quarters. See Appendix D for an illustration of this as applied to trigonometry and solid geometry. Such a change might require a re-evaluation of the relationship between a quarter and a semester credit. Still another possibility is to schedule certain courses, like creative writing, in alternate years, for juniors and seniors, so that the enrollments will justify the offering of such courses.

Selected Problems--Insuring equivalent curricular opportunities for all groups of students will not be easy. It is doubtful that all elective courses, particularly those for which there is one section, can be kept. Whether or not the elimination of certain courses will seriously detract from a rich curriculum is difficult to say.

Both teachers and students are affected by the second problem: the fact that, in some cases, students will need to complete a year's work under two (possibly, three) teachers. Unless the organization of the year's course is well planned, chaos could result for the students. The teachers, on the other hand, will need not only to plan very carefully but to become acquainted with an even greater number of students than is presently the case. Furthermore, some teachers may feel that their work is "incomplete" when they instruct students for only part of the year's course.

The four-quarter rotation plan may also require more teachers to make several preparations in one subject area (e.g., algebra 1-2-3 and algebra 4-5-6) and to teach electives in fields other than those of their specialization.

Teacher Scheduling

The principal is responsible for scheduling his teachers' vacations as well as for assigning them their teaching programs. While teachers may express their vacation preferences, the principal will have the discretion to schedule teachers in such a way as to meet curricular needs most effectively.

As noted in the previous section, the work load of teachers may increase if additional preparations are necessary. Furthermore, teachers who are assigned one-quarter double-period courses will be meeting new students every quarter. Teachers in certain fields may find

themselves teaching the end of the course to students who began the course with other teachers. Teachers in highly specialized fields may have to teach for four quarters, more often than they care to, if no adequate replacements can be found. Such teachers may be denied opportunities for professional self-improvement because of the impossibility of attending summer courses at the University.

In order to enable teachers to take courses during their quarter of vacation, the cooperation of the University of Hawaii is necessary. There may be a request to schedule professional courses to fit the schedule of the four-quarter rotation plan, to offer more in-service courses, and to experiment with evening or Saturday morning courses.

Student Scheduling and Activities

The procedures for scheduling students, outlined previously, will be disadvantageous to some students for a variety of reasons. Since the traditional "summer school" will not be offered, students will have to do their make-up or enrichment work at other institutions. This may not be possible if other schools are under the four-quarter rotation plan. If they are not, only students with vacation periods in the summer months will be able to benefit from this extra opportunity. Some students may find their assigned vacation periods inconvenient for them and their families, but they will probably have to remain on that schedule throughout the four years in high school, if balanced enrollments are to be maintained.

Students transferring in and out of Kailua may find some difficulty in progressing with their educational plans. From September 1 to December 30, 1962, 69 new students registered at Kailua High School and 150 left school (this figure includes drop-outs, expelled students, and transfers to other schools)--these figures represent

about 10 per cent of the student body. In addition, approximately 350 students who were scheduled to register for admission into Kailua High School did not do so. This was, however, offset by approximately the same number who registered at Kailua who were not originally on Kailua's list. While this may represent a movement of about 700 students in and out of the Kailua area during the summer months alone, some of these students doubtless remained in Kailua but changed their educational plans.

Several problems arise in a mobile community. Should transfer students be automatically placed in their groups, according to surname, without regard for minimizing the loss of time? For example, if a student transfers in September, and his surname would ordinarily place him in Group B, should an exception be made by placing him in Group A, so that he will not have an approximate vacation of six months? If the transfer takes place after school has started, the problem is further complicated by the necessity to provide the best continuity possible.

Student activities--student government, student clubs, athletics, band, chorus--will be affected by the four-quarter rotation plan. On what basis, for example, will student government be organized? Unless four sets of officers--one for each quarter--are selected, there is the probability that one or more officers may be on vacation at any given time. Will vacationing athletes be allowed to participate in interscholastic events? Not granting students this privilege may arouse protests especially if certain "stars" are on vacation; on the other hand, permitting participation may bring criticisms regarding the undue emphasis given to athletics.

Another concern is related to community activities which serve to enrich the lives of youth. Unless such activities are offered year-round, it is conceivable that only students on vacation during the summer quarter will be able to take advantage of certain opportunities for

recreation and self-development.

State Administrative Practices

Should the public schools in Hawaii be placed on a four-quarter rotation calendar, the department of education may find it necessary to study a number of areas and to make some changes. This section explores some of these areas in terms of (a) the calendar, (b) the curriculum, (c) the professional staff, (d) the non-professional staff, and (e) the students.

The Calendar--As specified earlier, it was necessary to schedule only a day as a "quarter break" because of the 180-day school year. In light of the possible inadequacy of this arrangement, and the fact that the national median is 177.9 days,[8] it may be advisable to define the minimum school year as a range; e.g., 177-182 days, since there is a slight variation in the number of days each group attends school. It is interesting to note that in 1957-58, the average length of the school year was 178.2 for Hawaii; the conjecture being that some schools were forced to close down because of some emergencies--lack of water, storm damage, etc.

There has been no consideration of the "trimester" plan for the public schools because such a calendar would not meet the 180-day minimum.[9] Under the "trimester" plan, (a) the year is divided into three equal terms of approximately 15 weeks, and (b) an academic year is composed of two "trimesters" or 30 weeks of instruction. The latter would fall far short of 180 days. However, conversion

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[8]National Education Association, Research Division, Ranking of the States (Washington, D. C.: the Association, January, 1962), p. 19.

[9]The plan is discussed in some detail in the next chapter since some universities have adopted a trimester calendar.

from a semester to "trimester" calendar simplifies curriculum organization, makes course scheduling easier, and may enable more students to complete a course with one teacher.

The Curriculum--Adoption of the four-quarter rotation plan will require better curriculum organization to a greater extent. It is difficult to say how specific and detailed the curriculum guides of the State should be, but in view of the fact that students completing a course under several teachers, as well as transfer students, are affected, the department may find it necessary to exercise even more detailed direction in curriculum development.

The Professional Staff--Among the many questions requiring attention are the following: (a) What provisions should be made for Teachers' Institute Day? (b) How should increment dates for salary purposes be set? (c) Are teachers, working during all four quarters, entitled to proportionately more days of sick leave and eligible at an earlier date for sabbatical leaves? (d) How should the "pools" for rotating administrative positions be established?

Still another problem is the increased record-keeping necessary in the department's personnel office and business office.

The Non-Professional Staff--The problem of scheduling vacations for clerical and secretarial personnel arises because present regulations require that others on the staff absorb the work of those who are on vacation since no provisions for replacements are made. This might be extremely difficult. For example, operating a school without an attendance clerk for three weeks may be somewhat chaotic.

Similar difficulties may arise in attempting to manage the cafeteria with an incomplete staff at times when a worker is on vacation, or to maintain the physical

plant when the custodial staff is incomplete.

The Students--The department of education will probably find it desirable to urge public and private agencies whose activities affect the school-age population to modify their programs so that they will operate on a year-round basis. It may also be helpful for the department, together with appropriate government and business groups, to explore part-time employment possibilities for older students on a year-round, rather than seasonal, basis.

Estimated Costs

The business office of the department of education was asked by the legislative reference bureau to compute the costs for operations and capital improvements at Kailua High School in 1966-67 under (a) the present calendar and (b) the four-quarter rotation plan. These estimates are based on the characteristics of the four-quarter rotation plan, as set forth in an earlier section of this chapter.

The data in Table 4 indicate an increase in operational costs of $28,246 under the four-quarter rotation plan, and a savings of $520,000 in capital improvements, assuming that 26 fewer classrooms will be needed ($20,000 cost per classroom). In evaluating the increase in operational costs under the four-quarter rotation plan, it is important to note that two-thirds of the increase is comprised of salaries for administrative staff members whose positions need to be filled during all four quarters. The total estimate may be somewhat too high since it is based on retaining the same number of administrative staff members although the student enrollment per quarter would be lower. On the other hand, the four-quarter rotation plan requires more administering than the present calendar.

Table 4

COMPARATIVE COSTS FOR OPERATIONS AND CAPITAL IMPROVEMENTS AT KAILUA HIGH SCHOOL UNDER THE PRESENT CALENDAR AND THE FOUR-QUARTER ROTATION PLAN
1966-67

Feature	Present Calendar	Four-Quarter Rotation Plan
Number of students per term	3,307 per semester	2,480 per quarter
Total number of students completing the academic year	3,307	3,307

	Present Calendar		Four-Quarter Rotation Plan				
			Personnel				
	No. of Personnel	Salaries	Number	Full-Time Equivalent Per Present Calendar	Salaries	Additional Costs	Savings
Administrative Staff*							
Principal	1	$ 10,164	1	1.33	$ 13,552	$ 3,388	
Vice Principal	1	8,364	1	1.33	11,152	2,788	
Registrar	1	5,388	1	1.33	7,184	1,796	
Librarian	1	5,388	1	1.33	7,184	1,796	
Counselor	5	26,940	5	6.67	35,920	8,980	
	9	$ 56,244	9	11.99	$ 74,992	$18,748	
Teaching Staff							
Regular Teachers	104	$ 560,352	78**	104.00	$ 560,352	---	
Cooperative Office Training	1	8,484	1**	1.33	11,312	$ 2,828	
Intern Supervisors	2	13,296	2	2.00	13,296	---	
	107	$ 582,132	81	107.33	$ 584,960	$ 2,828	
Classified Personnel*							
Cafeteria Manager	1	$ 5,328	1	1.33	$ 7,548	$ 2,220	
Cafeteria Cooks	2	7,968	2	2.00	8,632	664	
Cafeteria Helpers	6	21,672	6	6.00	23,478	1,806	
Secretary	1	5,328	1	1.00	5,772	444	
Account Clerk	1	3,984	1	1.00	4,316	332	
Clerk Steno	1	3,612	1	1.00	3,913	301	
Typists	3	10,836	3	3.00	11,739	903	
	15	$ 58,728	15	15.33	$ 65,398	$ 6,670	
Sub-Total	131	$ 697,104	105	134.65	$ 725,350	$28,246	
Classrooms***	105 (Class-rooms)	$2,100,000 (Cost)	79 (Class-rooms)		$1,580,000 (Cost)		($520,000)

Table 4 (continued)

Source: Hawaii, Department of Education, Business Office (February 4, 1963).

*Because of a lower daily enrollment under the four-quarter rotation plan, a few positions would be cut if they were assigned according to the present ratio. This would reduce operational costs and would result in savings. However, because the complexity of the four-quarter plan entails greater clerical and administrative work, the full staff is maintained in spite of the lower daily average attendance.

**Although 78 teachers will be on the staff every quarter, in actuality 94 teachers, teaching 10 out of 12 quarters, are necessary as a pool. Out of the 94 teachers, 31 will be teaching for four quarters, the remaining 63 for three quarters. The same amount of money is necessary for teachers' salaries under the present calendar and the four-quarter plan. However, under the four-quarter rotation plan, the 31 teachers who work during the fourth quarter receive salaries which are 1/3 above those they would receive under the present calendar.

***Buildings
1. Needed under present plan: 105 rooms x $20,000 = $2,100,000.
2. Needed under new plan: 79 rooms x $20,000 = $1,580,000.
3. Number of classrooms now available: 78.

At the same time, the total estimates of increased operational costs tend to be understated, especially in terms of the future, for no account is taken of increased indirect costs such as retirement allowances nor of the likely increases over time attributable to salary increments or raises. In evaluating the expenditure for capital improvements, it is important to note that no allowance has been made for the cost of additional land which may be required. Assuming it were necessary to obtain land, the real capital costs would be greatly increased if the land were purchased on the market; further the hypothetical capital costs would be higher if the land were obtained through exchanges and executive orders. One other factor should be considered. An expenditure made at the time the building is constructed is a one-time disbursement. In recent years there has been some tendency for construction costs to rise. Assuming this trend continues, construction of 26 classrooms today, rather than in increments over several years, would result in some savings in building costs.

Tenuous as these data are, an attempt is made to compare these estimated costs of operations and capital improvements under the four-quarter rotation plan and the present calendar. In view of the present practice to issue bonds for 20 years and of the estimation of the life of a school building as being 40 years, the costs for capital improvements are calculated in three ways. It is assumed that the additional school buildings are financed by the city and county of Honolulu by a $520,000 general obligation bond issue bearing interest at (a) 3 per cent annually for 20 years, (b) 3.25 per cent for the next 30 years, and (c) 3.4 per cent for the next 40

years.[10] The total expenditures necessary for Kailua High to accommodate its increased enrollment under the present calendar and under the four-quarter rotation plan are found in Table 5.

An examination of Table 5 reveals that the total operating costs over a 40-year period (estimated life of a school building) under the four-quarter rotation plan exceed the cost of constructing additional classrooms financed by bond issues bearing current rates of interest for different periods of time. The longer the period of payment for the bond, the higher the total expenditure for capital improvements under the present calendar and the smaller the difference between the additional costs incurred under both plans.

Several items have not been included in these estimates. The costs of books, supplies, and equipment have been omitted since there will be no difference in per pupil costs. Maintenance and repair costs have been disregarded because it was felt that while repair costs might be higher when rooms are in constant use, this might be offset by the fact that there will be 26 fewer classrooms to maintain. Administrative costs at the state level have not been included, although the necessity for complex record keeping, especially in the department's personnel office, may require additional employees.

Most of the mainland studies revealed that the four-quarter plan would be more costly than the traditional plan even if the latter included costs of new construction. While these studies did not include detailed

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[10]The rate of interest, period for payment, and calculation of the payment were determined with the assistance of the budget office of the city and county of Honolulu and the department of budget and finance of the State of Hawaii.

Table 5

COMPARATIVE ADDITIONAL COSTS FOR KAILUA HIGH SCHOOL UNDER THE PRESENT CALENDAR AND THE FOUR-QUARTER ROTATION PLAN BASED ON THE ASSUMPTION OF A 40-YEAR USE OF A SCHOOL BUILDING
1966-67

Example	Capital Improvement Costs Under the Present Calendar				Operational Costs Under the Four-Quarter Rotation Plan	
	Issue	Term (Years)	Interest (Per Cent)	Total Expenditure	Total Expenditure	
A	$520,000	20	3.00	$683,800	$1,129,840	(or $28,246 annually for 40 years)
B	520,000	30	3.25	786,500	1,129,840	(or $28,246 annually for 40 years)
C	520,000	40	3.40	882,440	1,129,840	(or $28,246 annually for 40 years)

Source: Hawaii, Department of Budget and Finance.

analyses, the following factors were mentioned as contributing to increased costs: (a) maintenance costs increased since most of the work had to be done on Saturdays, after school hours, and holidays; paying time and a half for this was costly; (b) it was necessary to install air-conditioners for the summer months; (c) transportation costs increased tremendously; running the school bus for 12 months for a 3/4 load all year would be costly.

In Hawaii there is no necessity to install air-conditioners; much of the maintenance work is currently done during the school day; and, for the moment, there is no statewide school transportation system. Without these considerations, the hypothetical application of the four-quarter rotation plan to Kailua High School shows that it will be somewhat more costly than operations under the present calendar. Whether this would be true for the entire public education system in Hawaii is difficult to say because the Kailua example, as explained above, is not sufficiently detailed nor representative of State conditions, to use as a basis for broad generalizations. One can conclude, however, that economic factors alone can not justify the adoption of the four-quarter rotation plan.

Chapter IV

STUDIES AND EXPERIENCES OF SELECTED INSTITUTIONS OF HIGHER EDUCATION

Most institutions of higher education are currently operating under the semester calendar. In January 1960, out of 1,058 regionally accredited universities and colleges, only 147 or 14 per cent were on the quarter schedule; most of the remaining were on the semester system.[1]

Although the two-semester calendar is popular today, it is a fairly recent development. W. H. Cowley, who conducted an intensive study of university calendars, outlined their historical development: (a) the four-term pattern, adopted by Harvard in 1636, was patterned after that of Oxford and Cambridge; (b) the three-term pattern predominated during the 18th and 19th centuries in both the pre-revolutionary privately-endorsed institutions in the East and the 19th century state universities in the Middle West; (c) the semester system developed in the mid-19th century; and (d) the quarter system originated at the University of Chicago in 1917.[2] Cowley also

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[1] A listing furnished by the Office of Statistical Information and Research of the American Council on Education found in: American Association of Collegiate Registrars and Admissions Officers, Committee on the University Calendar, The University Calendar (1961), p. 6; hereafter referred to as AACRAO.

[2] William H. Cowley, Study of the Relative Merits of the Quarter and Semester Systems (Columbus: Ohio State University, 1932) as found in: Thad L. Hungate and Earl J. McGrath, A New Trimester Three-Year Degree Program, A publication of the Institute of Higher Education (New York: Teachers College, Columbia University, 1963), pp. 5-6.

pointed out the conditions which gave rise to and caused the abandonment of these calendars. The semester system, with its summer vacation of three months, seemingly originated in the days when students were needed to harvest crops on the farms.

Most universities with the semester calendar do not close down completely in June; they operate summer sessions of varying lengths which (a) generally cater to a clientele somewhat different from the student body during the academic year, (b) offer a usually limited curriculum, although a few extra courses may be added, and (c) are taught by a fraction of the regular staff, sometimes supplemented by visiting professors. Acceleration is possible under the semester calendar, but the probability is dependent on how summer course offerings are related to the required sequence of courses. In certain curricula and professional schools, however, early graduation would not be possible through summer study.

The semester plan with an integrated and expanded summer session can thus be classified as one approach to year-round operations. Three other popular patterns can likewise be classified as follows: quarter system, trimester system, and split third-term plan. These four plans are described in the subsequent section.

Omitted from this discussion of year-round operations of educational institutions are calendar changes which have been adopted for pedagogical reasons primarily. An outstanding example is the Dartmouth calendar.[3]

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[3]Beginning in 1958-59, Dartmouth College changed from a semester system to a three-term three-course program. Although the timing generally fits that of the quarter system, the subjects have the same content as under the semester system and students are restricted to three subjects per term. Normally each class meets four times weekly and the extra hour is scheduled for supplementary activities. It was felt that this calendar would

Alternative Plans for Year-Round Operations

In addition to a brief description of each of the four plans enumerated above, this section also includes an exploration of some of the advantages and disadvantages of each approach. Much attention is focused on the trimester calendar because it has been studied by several institutions in recent years, some of which have adopted the plan. Figure 1 illustrates the typical calendar for each of these plans.

Semester Plan with Integrated and Expanded Summer Session

A university with a semester calendar will probably find this plan the simplest means of moving to year-round operation. This plan preserves the two semesters but replaces the usual six-week summer session with a twelve-week summer term integrated administratively with the academic year. There are thus two semesters and a quarter term. The summer term may be split into two six-week periods. Among the institutions adopting the semester plan with expanded summer session are the University of California and the University of North Carolina.[4]

In 1961 California's Regents authorized a 12-week summer session or two six-week sessions at the University

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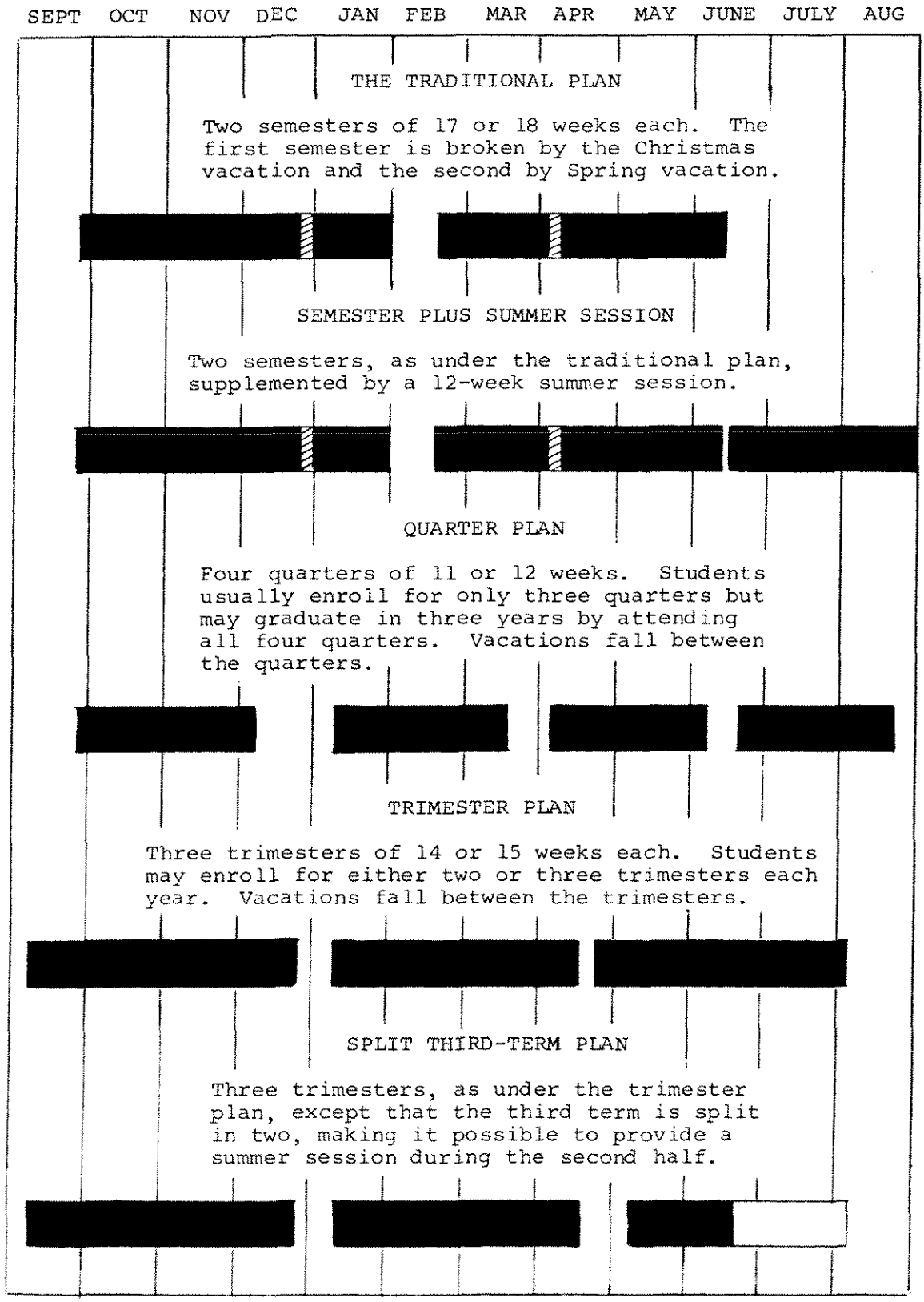
enable students to increase their own responsibility for education and to change the emphasis from teaching to learning. (AACRAO, op. cit., pp. 26-35.) Other colleges with a similar calendar are: Carleton, Goucher, Earlham, Lake Forest, Lawrence, Monmouth, and Coe. (Joseph E. McCabe, "The 3-3 Plan", Saturday Review (December 15, 1962), p. 54.)

[4]The University of Wisconsin is requesting funds from the Legislature to initiate a 12-week summer session on the Madison campus. (Letter, I. L. Baldwin, Special Assistant to the President, University of Wisconsin, September 18, 1962.)

Figure 1

COLLEGE CALENDARS



Source: Saturday Review, "College Can Operate All Year", Saturday Review (December 15, 1962), p. 51. Some modifications were made of the diagrams and diagrams were added for the semester plus summer session and split third-term plans.

of California. (In 1962, however, the Regents requested the administration to prepare for a full three-term calendar for 1964-65.) Three equal terms of approximately 16 weeks each are contemplated. Furthermore, "the University will encourage students to distribute themselves equally over the three terms but there are no plans at present to require such distribution. We shall undertake to make the three terms equal in all respects both academically, and in terms of the cultural and related aspects of campus life."[5] The student interested in acceleration may graduate in three calendar years by taking a small overload each semester. This plan has the advantages of requiring no radical changes from the semester calendar and of maintaining coordination with junior college calendars. The plan does not, however, eliminate the "lame-duck" session after Christmas. The timing of the two six-week summer sessions (extending from June 10 to August 31) is not convenient for public school teachers.

The University of North Carolina, after studying the trimester system, decided in 1961 not to make any changes, but rather to continue the system of having two semesters and two six-week summer sessions. It was felt that summer sessions are used for acceleration as well as for making up deficiencies; such purposes would be more conveniently achieved in two six-week sessions, rather than a single twelve-week session.

The Regents of the State of Iowa have approved a plan to adopt the twelve-week summer session at three state-controlled institutions: University of Iowa, Iowa State University, and State College of Iowa. The extended

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[5]Letter, Frank L. Kidner, University Dean of Educational Relations, University of California, August 28, 1962.

summer sessions are aimed at lower division students, and enable them to complete their baccalaureate work more rapidly.

Since the inception of the semester system in 1856 at the University of Michigan, a number of institutions have attempted to vary their calendars so as to eliminate the lame-duck period. The University of California at Berkeley, for example, from 1892 to 1943 had a fall semester which ended before Christmas, but the plan was abandoned in order to coordinate the University's calendar with the calendars of junior colleges and of University branches.

Recently, a number of variants have been proposed: (a) initiate the fall semester so as to complete classes before Christmas and schedule the examination period immediately thereafter and (b) begin the fall semester in October so that the period following the Christmas holidays would be long enough so as to eliminate the "lame-duck" feature. Although these two plans are under consideration, only the former has been adopted.

The University of Buffalo, effective September 1962, has the fall semester beginning early in September so that there are 15 weeks of instruction prior to Christmas.[6] An eight-day examination period is scheduled immediately after the Christmas vacation, and a five-day term break is also provided. This plan has the advantage of eliminating the "lame-duck" session and of simplifying any subsequent shift to the trimester system.

In addition to providing a twelve-week summer session, the University of Pennsylvania also has two semesters which are scheduled so as to utilize Christmas as a between-semester break. In 1961 the University of

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[6]New York, Fordham University, "Report on Conference on Twelve-Month Operation of Academic Programs", Albany, January 31, 1962 (Mimeographed), p. 4.

Pennsylvania introduced a calendar of a 15-week semester before Christmas, a 16-week semester after Christmas, and a 12-week summer term, split in two 6-week periods. Should a trimester system be desired, a third 15-week term can be inserted between the winter and fall terms.

Quarter System

This system usually provides four terms of approximately 11 weeks each--10 weeks of class work and 1 week for examinations. The four terms are separated by Christmas, spring, June, and Labor Day breaks. The summer quarter generally is somewhat shorter, oftentimes split into two sessions to accommodate students. The summer term is usually treated separately from the other three which comprise an academic year. Institutions on a quarter system can easily convert to year-round operations by lengthening the summer term. This would enable students to graduate in three calendar years.

Among the advantages of the quarter system are: (a) the calendar is coordinated with national holidays; (b) students take fewer courses in any given quarter; (c) the calendar articulates well with the public school calendar both in September and June; (d) the plan is easily converted to year-round operations.

The following disadvantages are frequently mentioned: (a) the quarter system, as compared to the semester system, requires an extra registration period and an extra exam period; (b) a full summer quarter is not practical for schools with well-established summer sessions; (c) conversion from a semester to quarter schedule is costly and complex.

Although a number of large universities adopted the quarter calendar in the past, year-round operations were not necessarily the intent of these institutions. Unfortunately, data could not be found on the extent to which students accelerated in such institutions as

Minnesota, Ohio State, Stanford, and others. There is one study, conducted by Michigan State University, which indicates that "Thirty-seven per cent of the 'regular' students . . . were in summer school to finish their degrees in less than the usual time. . . . To date only a handful of students have completed undergraduate programs in less than four years."[7]

Antioch College is an example of an institution which adopted the four-quarter calendar for year-round operations in July 1961. Students are divided into Divisions A and B; while Division A students study on campus, those in B are engaged in work programs. The new calendar does not shorten the matriculation period, for Antioch students normally take five years to complete their study-work program. By making it compulsory for half the student body to attend the summer quarter, Antioch planned to increase total enrollment by 25 per cent and increase faculty and staff by 10 per cent. A recent report indicates that there was an "8 per cent increase in faculty for 1962-63 over 1959-60 although total enrollment will have increased 25 per cent from 1,275 to 1,600. Since Antioch is in session four quarters a year but regular faculty are on duty only three quarters, this 8 per cent increase includes visiting faculty who pick up the extra quarter's load."[8]

A slight variation of the quarter system was introduced at Pennsylvania State University in 1961. The academic year is divided into four terms, ten weeks each. Class periods, however, were lengthened from 50 to 75 minutes, thus enabling the university to offer courses

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[7]Michigan State University, Office of Institutional Research, "A Survey of Summer School Students, Summer 1960", by Joe L. Saupe (Mimeographed; July 5, 1961), p. 3.

[8]Marjorie Freed, "The Antioch Plan", Saturday Review (December 15, 1962), p. 54.

with semester credit under the four-term plan. A student is able to complete his baccalaureate degree work in three years since the summer term offerings are equivalent to those of the other three terms. The initial reaction to the new calendar is favorable as evidenced by the following statement from one of Pennsylvania State's administrators: "Two benefits seem to have resulted from our calendar change. One involves the greater utilization of our facilities, especially through the admission of freshmen four times a year, and through increased attendance during the summer term. The other major benefit results from an increased seriousness on the part of our students and a significant increase in academic achievement. The average grades are higher, more students are on the Honor Roll, and fewer students are on probation."[9]

Trimester System[10]

Under the trimester calendar, semesters are shortened from the typical 16-1/2 weeks in length (15 weeks for instruction and 1-1/2 weeks for examinations) to 15 weeks, including the exam period. This enables the scheduling of three semesters during the year: (a) between Labor Day and Christmas, (b) from early January to mid-April, and (c) from late April to early August. Summer vacation is shortened from three months to one month or less. The summer session is not integrated with the trimester program, but is planned to serve the summer clientele and runs concurrently with the latter part of the third trimester.

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[9]Letter, Robert G. Bernreuter, Special Assistant to the President for Student Affairs, Pennsylvania State University, June 28, 1962.

[10]"Trimester" literally means "a three-month period". However, the term is used to describe a three-semester year-round calendar; a preferred synonym for this practice is "quadrimester".

In view of the growing popularity of the trimester system, this discussion includes descriptions of the following aspects: (a) program at the University of Pittsburgh, (b) other programs in selected institutions, (c) summary of pertinent research results, and (d) a recent variant.

Program at the University of Pittsburgh[11]--The University of Pittsburgh introduced the trimester system for various reasons:

> The University of Pittsburgh has committed itself to a drastic reform of its academic calendar in order to meet . . . various needs . . . the needs of (1) providing each of its graduates with both sound liberal education and thorough professional training, (2) graduating its students at an age when there are still some years of the prime period of life left to them, (3) helping to meet society's need for an increased supply of trained manpower, and (4) providing for the admission of larger numbers of students without the necessity of a proportionate increase in physical facilities and teaching staff. . . .[12]

The decision to adopt the trimester calendar was preceded by much faculty and administrative deliberation and planning. The Committee on a Trimester Calendar worked during 1957-58 to study the feasibility of a trimester calendar; opinions were solicited from faculty members and administrative officers regarding the probable effects of the new calendar. The thorough inquiry of this group indicated the feasibility of the trimester calendar for most of the schools and divisions of Pittsburgh, provided that teaching staff and certain

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[11]In addition to the various committee reports issued by the University of Pittsburgh, the author's visit to the Pittsburgh's campus proved extremely informative.

[12]University of Pittsburgh, Committee on a Trimester Calendar, "Background Information on the Trimester Plan of the University of Pittsburgh" (Mimeographed; December 22, 1958), p. 2.

physical facilities were increased and that other problems were satisfactorily resolved.

In order to ease the transition to the new calendar, the Planning Committee worked in the summer of 1958 to list in detail the tasks which had to be performed in the various parts of the University.

In the fall of 1959 the trimester calendar was adopted by all parts of the University except in certain schools--Law, Medicine, and Dentistry--where problems of licensure or accreditation were expected, but did not materialize. These schools, however, offer "year-round" educational programs differing only in detail from the trimester system.[13] The time table for the other divisions and schools was as follows: in 1959-60, there was actual trimester operation in the freshman and sophomore programs; in 1960-61 in all undergraduate programs; in 1961-62 in graduate and post-baccalaureate professional programs. Summer sessions were initially not affected, but beginning in 1961 they were planned to meet the needs particularly of public school and college teachers.

Among the major features of Pittsburgh's trimester calendar are the following:

1. There are three academic terms of 15 weeks each, followed by a month of summer vacation. Although there were no scheduled exam periods at first, they were later provided to be used at the discretion of instructors. Another change was the provision of a one-week break between the second and third terms, thus reducing the length of the summer vacation.

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[13] University of Pittsburgh, Handbook For Faculty (September 1962), p. 10.

2. Faculty members are either on 9- or 12-month appointments. Those on 9-month contracts who teach in the third trimester are compensated at the rate of one-third their basic 9-month salary. There is no general policy on the number of consecutive terms during which faculty members can teach. There is a provision on sabbatical leaves which stipulates that "eligibility is, as a rule, limited to those with rank of associate or full professors who have 12 trimesters of service. Priority will in general be given to those of longer service."[14]
3. Class identity of students is based on the year of graduation rather than of entry. Eligibility for student government offices is expressed in number of terms completed.

Some of the effects resulting from the adoption of the trimester calendar are discussed below:

1. Faculty. Pittsburgh has not had difficulty in finding a sufficient number of professors to teach during the third term. Faculty members who teach for two terms have a shorter academic year than previously and about two months more for continued research.

Several administrators at Pittsburgh expressed the view that there was increasing acceptance of the trimester calendar among faculty members. One suggested that some professors, especially those interested in research, were being attracted to Pittsburgh because of the longer uninterrupted period and interim periods for research made possible under the trimester system. Furthermore, it was indicated that foreign travel and college visitations were more easily scheduled during trimesters other than the summer.

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[14] Ibid., p. 30.

2. Students. In general, students are evidencing increasingly greater acceptance of the trimester schedule; e.g., greater percentages of students are beginning to attend the third trimester and third-termers are increasing their credit load so as to approach the average load in the fall. In 1961 there were indications that approximately 25 per cent of the incoming freshman class would attend the third trimester. However, it was found that about 60 per cent of all eligible students attend the University for a year-round period.

Studies have not supported the hypothesis that third-termers would be students with the better academic records; an early study indicated no statistically significant differences in the academic quality and credit loads of two- and three-termers. It was, therefore, concluded that: "the primary use being made of the third term is as a means to obtain the bachelor's degree earlier rather than as a means to make up failed courses or to adjust credit loads".[15]

Another survey was designed to determine the extent to which the academic, social, and economic needs of students were being met by the trimester calendar. Forty variables were investigated and statistical tools were employed. Based on this analysis, a partial description of the third-termer is possible:

> This statistically constructed student is an older male who is enrolled in an undergraduate, goal-oriented or pre-professional program. He is an upperclassman who in any term normally carries a heavy credit load. His home is close to the University, and he has to drive to classes. He generally does not participate in formal student

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[15] University of Pittsburgh, Office of Institutional Planning, "Comparison of Academic Aptitude and Academic Performance of Two and Three Term Attenders from the 1959 Entering Freshman Class Under the Trimester Calendar at the University of Pittsburgh" (Mimeographed; March 1961), p. 4.

> activities. He feels that course offerings during all terms were adequate to his objectives. He has a favorable opinion of the trimester program, and because of the program he will reach his vocational and educational goals at an earlier date. He also feels that the trimester calendar has considerably improved his chances for continuing his education beyond the baccalaureate degree.[16]

A recent study of accelerated, traditional, and decelerated enrollees indicates that liberal arts students who have voluntarily accelerated their baccalaureate program: (a) earn quality point averages equal to or higher than those of traditional attenders, and (b) score as well as or higher than traditional attenders on the Graduate Record Area Examinations during the sophomore and senior years.[17] Another report on accelerated and traditional students generally supports these conclusions about accelerated students.[18]

Since Pittsburgh recognized that third-term attendance would be costly to the student, financial aid funds were increased. The number of students who applied for aid to attend the third term has been lower than had been expected. In fact, although almost 60 per cent of the students eligible to attend the third term have enrolled, the aid funds granted for the third term have been about

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[16]University of Pittsburgh, Office of Institutional Planning, "Characteristics and Attitudes of Students Attending the University of Pittsburgh Under the Trimester Calendar" (Mimeographed; 1961), pp. 57-58.

[17]University of Pittsburgh, Office of Planning and Policy Coordination, "Measurement of Academic Achievement and Performance of Accelerated, Traditional and Decelerated Attenders at the University of Pittsburgh", by Carl E. Wedekind and Patricia Jervis (Mimeographed; March 1963).

[18]University of Pittsburgh, Office of Planning and Policy Coordination, "Comparison of Students Earning the Baccalaureate Degree at the University of Pittsburgh Between April 1962 and April 1963 in Terms of Acceleration", by Hilda Jones (Mimeographed; May 1963).

25 per cent of those granted for the fall or winter term.

Providing equal extracurricular opportunities in all three trimesters was difficult. Lectures, concerts, movies, and student newspapers may be costly to provide during the third trimester if enrollment is low.

The intercollegiate athletic program also presented some difficulties. Since it is possible for a student to graduate in 2-2/3 years, his eligibility as a football or basketball player is seriously curtailed. Although the rules may be changed so that years of participation can be used as a base rather than attainment of a baccalaureate degree, the student interested in athletics will probably decide to forego the advantages of early graduation. Another problem deals with the existence of contests in all sports--baseball, track, and tennis, for example--after the spring trimester is over.

3. Curriculum. A basic change in an academic calendar necessitates a re-evaluation of the curriculum.

> . . . The people at Pittsburgh believe that the adoption of the trimester forced them to set down their real objectives. This action has resulted in a decrease in the number of courses offered and a tendency toward the development of a common core within each discipline, with a field of cognate courses. Such a tendency has resulted in more interaction and an increase in the interdisciplinary approach.[19]

When necessary, the desirable minimum class size of 10-12 students is overlooked to provide a required sequence of courses.

4. Administration. Department heads need to plan curriculum offerings and make teaching assignments for three terms during the year. A difficult task is to schedule courses so as to make offerings equal in the

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[19]University of Pittsburgh, "Proceedings of the Conference on Year 'Round Education, University of Pittsburgh, March 1961", edited by Hilda Jones (Mimeographed; 1961), pp. 5-6.

three terms, and to enable students to accelerate their baccalaureate work.

Registration procedures have been streamlined at Pittsburgh. Pre-registration is utilized so that students register in the preceding term; this sometimes requires registration by mail. Coupled with pre-registration is an effective advisory system. Since registration is spread over the entire year, and not concentrated in selected weeks, no additional personnel have been necessary in the registrar's office. Payment by check--by mail--is also becoming increasingly popular.

The trimester calendar also requires careful planning to make most effective use of the custodial and maintenance crews. This did not prove to be a problem for the University.

5. Fiscal matters. Fiscal problems are minimized when enrollment in the third trimester approaches that of the other two. Until then, the assessment of student intentions is important in attempting to "match" curriculum offerings with the nature of the anticipated enrollment. The University of Pittsburgh makes the following observation:

> The big advantage of the year 'round calendar from a fiscal point of view is in the reduction of overhead realized in the greater utilization of plant and in the ability to serve more students without increasing the cost of administrative salaries. It should be remembered that the apparent gain in greater utilization of faculty will be valid only during the period of transition. Ultimately, it will become necessary to increase the staff to provide for additional teaching personnel. Only to the extent that the increase is not directly proportionate to the increase in the size of the student body will there be any fiscal gain in the area of faculty costs.[20]

During Pittsburgh's first year of trimester operation, additional expenditures were necessary for faculty

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[20] Ibid., p. 10.

salaries, utilities, and clerical and custodial salaries (very slight). However, student income exceeded the additional expenses and provided for extra scholarship funds.

> . . . It was estimated that the added costs of trimester operation . . . would total about ten to fifteen thousand dollars more than would be received from tuition. This situation would seem, at first glance, to represent a loss; but actually, regardless of income, it resulted in more efficient use of plant and administrative personnel. The actual additional income from tuition and fees was $868,000 against added costs of $475,000. This represented a net excess of income over expense of $393,000 which contributed to the reduction of overhead.[21]

Such financial returns, however, are not expected to continue. As more staff becomes necessary, additional office and laboratory space may be necessary. However, both classroom and office space will be utilized approximately 50 per cent more than under the two-semester calendar and only 2/3 as much new construction required under the semester system will be necessary to meet increases in enrollment under the trimester plan.

As the University of Pittsburgh continues on year-round operations, more data will be forthcoming, for built into the plans for the trimester system are continuing research projects which explore the characteristics of the student body.

Programs at Other Selected Institutions--In addition to Pittsburgh, a number of institutions have adopted the trimester calendar. This discussion is not an exhaustive or comprehensive summary of the status of the trimester system, but rather an indication of how selected universities are approaching year-round operations.

Michigan State University Oakland adopted the trimester calendar in fall 1961. Faculty are compensated at the rate of 45 per cent of their base pay for teaching

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[21]AACRAO, op. cit., p. 47.

during the third term. Students are admitted only during the fall and winter trimesters and are strongly urged to attend school year-round to minimize difficulties in meeting academic requirements.

As a result of the intensive study conducted by Nelson Associates for the State University of New York, the Trustees decided to experiment with year-round operations.[22] During 1963-64, the trimester calendar will be instituted at one four-year college and one two-year technical and agricultural institute, and the four-quarter plan will be put into operation at one four-year college. In all three institutions, students will vacation for one term. On the basis of this experiment's results, New York will decide if and when other units of the state system should adopt year-round operations.

Among other institutions which operate on the trimester calendar are:[23]

1. Colorado: Fort Lewis Agricultural and Mechanical College.
2. Illinois: Northside Chicago Teachers College, Southside Chicago Teachers College, and Chicago City Junior College.
3. Indiana: Taylor University--in 1964 when it moves to its new campus.
4. Iowa: Parsons College.
5. Kentucky: Kentucky Southern.
6. Michigan: Delta College and Dearborn Center of the University of Michigan.
7. Missouri: Tarkio College.

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[22]Nelson Associates, Increasing College Capacity by Calendar Revision, A report to the State University of New York (New York: the University, 1961).

[23]University of Pittsburgh, Progress Reports on Year 'Round Education, edited by Hilda Jones, Volumes I, II, III (1960-62) and Sidney G. Tickton, The Year-Round Campus Catches On (New York: The Fund for the Advancement of Education, 1963).

8. Pennsylvania: California State College and Point Park Junior College.

9. South Carolina: Columbia College.

Brief Summary of Research Results--Discussions of the hypothetical advantages and disadvantages of the trimester calendar are frequently found in the literature. However, research projects which delve into the subject more deeply are not numerous. Two were found to be especially helpful.

Elmer C. Easton uses a mathematical approach in analyzing various operating schedules.[24] He emphasizes the importance of having more than one entering class per year and of having entering classes of equal size. Using mathematical models of different calendar systems, Easton found the trimester plan with three entering classes of the same size to be the most satisfactory from the standpoint of increased student capacity, highest operational efficiency, and most economical results. Among the conclusions is the suggestion that colleges may find it necessary to "enforce uniform distribution of students among several entering classes per year."[25] The American Association of Collegiate Registrars and Admissions Officers indicates that this requirement may be difficult to enforce.[26]

The study of the State University of New York by Nelson Associates also presents the concept of balanced enrollments. Nelson proposes that balanced enrollment in all three trimesters can be attained by admitting three segments of a freshman class at different periods,

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[24]Elmer C. Easton, Year-Round Operation of Colleges, Engineering Research Bulletin No. 41 (New Brunswick, New Jersey: Rutgers University, 1958).

[25]Ibid., p. 36.

[26]AACRAO, op. cit., p. 16.

but in numbers corresponding to the institution's own rate of student attrition as determined by its experiences. Nelson concludes that the balanced trimester calendar is slightly more efficient than the balanced four-quarter calendar, but that both are far superior to the conventional calendar in efficiency as determined by criteria listed below. The following illustrates the maximum gains which might be achieved under the balanced calendars in comparison to conventional calendars; the yearly enrollments are based on retention rates for the institutions in Nelson's study.

Criteria[27]	Balanced Trimester	Balanced Four-Quarter
1. Freshman Admissions	58% more	45% more
2. Graduates	58% more	45% more
3. Yearly Enrollment	71% more	61% more
4. Student Academic Years	58% more	45% more

The above advantages are attainable without increasing the number of students on campus at any one time.

A Variant of the Trimester System--Recently a publication of the Institute of Higher Education proposed an academic year of three terms of 14 weeks each, 13 for instruction and 1 for examinations.[28] Students would attend classes for nine terms (three years) to complete their baccalaureate work. Between two terms there would be a three-week vacation period and at the end of the third term there would be a four-week recess. This calendar is more "leisurely" than Pittsburgh's trimester

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[27]Nelson Associates, op. cit., p. 105.

[28]Thad L. Hungate and Earl J. McGrath, A New Trimester Three-Year Degree Program, Published for the Institute of Higher Education (New York: Columbia University, Teachers College, 1963), pp. 12-20.

calendar, and the authors feel that more students would be receptive to three-term attendance because of this.

Faculty members would be free of all institutional responsibilities every ninth term, or one term in three years. In view of increased faculty productivity, salaries should be increased by not less than 33-1/3 per cent. The authors point out that faculty members would have: (a) about 19-21 consecutive weeks for professional or recreational activities during their "free" term if the preceding and succeeding intersession vacations are included and (b) about 10 weeks of vacation--in three installments--during the two years of three-term teaching.

In addition to the advantages enumerated above for students and faculty, the authors point out some economic assets of their plan:

> . . . (5) It will markedly reduce the prospective expenditures for new buildings and equipment. (6) It will reduce the cost of current operation by making better use of the physical facilities, administrative personnel, and other resources. (7) It will improve the economics of operations of auxiliary enterprises such as dormitories, dining facilities, and bookstores.[29]

This variant of the trimester system is based on the assumption that higher education will not be able to meet increased demands unless a calendar revision has two objectives: (a) to relieve the teaching shortage by making more effective and fuller use of the existing teaching force and (b) to accelerate the undergraduate work of students so that it becomes "normal" to graduate in three, not four, years.

Split Third-Term Plan

The split third-term plan is very much like the trimester calendar; both have three terms, each equal to a semester's work and scheduled in similar fashion.

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[29] Ibid., p. 31.

However, under the split third-term plan, courses may be offered (a) for the entire third term, (b) the first half of the term only, or (c) the second half of the term only. Under this plan the second half of the term (July-August) can be used to meet the needs of public school teachers and other students who usually attend summer sessions.

State universities in Florida began to operate under the split third-term plan in 1962-63.[30] Faculty members are expected to teach for 10 months or 2-1/2 terms, and salaries have been increased by 11 per cent.

The University of Michigan is presently in the transition period from the semester to split third-term calendar. In 1963-64 the first term is scheduled to end before Christmas, and a single 8-week summer session is planned. The summer session, however, will be an "integrated half semester"; such a half-semester "would be similar in length, in timing, and in course offerings to the present summer session, but would serve as the first summer period in which responsibility for course offerings and programs would be clearly assigned to the individual departments and faculties in the knowledge that these offerings and programs would be expanded both in length of term and number of offerings in subsequent years."[31] When funds are available and student pressures make it necessary, the split third-term calendar will be put into operation. This situation is expected to occur in 1965 when it is estimated that the full impact of the population bulge will reach the universities. Under the Michigan plan, faculty members are expected to teach for two terms; those who teach during the eight-week

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[30]Florida, Office of the Board of Control, various mimeographed reports.

[31]University of Michigan, Senate Affairs, Vol. IX, No. 2 (April 1962), p. 1.

summer session are to receive 22.2 per cent of their academic year pay.

Before recommending the split third-term plan, the Commission on Year-Round Integrated Operation at the University of Michigan conducted an intensive study of various academic calendars and weighed their relative merits.[32] The Commission listed the advantages and disadvantages of this plan. Among the advantages are:

1. The plan conforms well to the present instructional pattern at Michigan.
2. The lame-duck session after Christmas is eliminated.
3. A two-week break between terms (every four months) makes it possible, "physically and mentally, for students and faculty to work more of the year than presently felt desirable."
4. The integration of the summer session would result in improved course offerings, more carefully planned curricula, and better employment conditions for professors.
5. Students are provided with maximum flexibility in planning their academic program; some may attend for three terms, others for 2-1/2 terms.
6. Opportunity is provided for regular students to gain at least a half-semester's work per year and for the summer session clientele to pursue courses of interest.
7. Faculty members are given more flexibility in planning when and for how long they are to remain on campus.
8. The physical facilities of the University would be put to maximum possible use.
9. A reduction in the unit cost of operating the University will result, without jeopardizing the economic status or working conditions of the faculty.

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[32]University of Michigan, "Report, Commission on Year-Round Integrated Operation" (Mimeographed; May 15, 1961).

10. Scheduling courses for the third term will not be unduly burdensome for the departments.[33]

The Michigan group points out the following disadvantages of the split third-term plan:

1. The semester is shortened from 16-1/2 weeks to 15 weeks or if 15-1/2 weeks is the length, the term breaks will be reduced to 1-1/2 weeks.
2. The shortened two-term academic year may pose problems in determining faculty salaries for the academic year and for the additional teaching during all or half of the third semester.
3. Departments will need to re-evaluate and reorganize their course sequences--particularly during a split term.
4. The recommended calendar is not too well articulated with the public school calendar.
5. Summer session clientele generally prefer a 6-week (rather than an 8-week) summer term.
6. Staffing the third term may be difficult.[34]

The University of Illinois also had a Committee on Year-Round Operation of the University. The Committee recommended that when the University finds it necessary to make more intensive use of facilities, the split third-term calendar should be adopted, pending certain conditions.[35] These are: (a) a more efficient system of registration; (b) a faculty assured that there will be no reduced renumeration or worsening employment conditions; (c) availability of sufficient funds to maintain current level of operations in the third term; (d) gradual and flexible progression in achieving the third term; (e) the widest possible faculty and administrative discussion preceding the shift; and (f) a coordinator appointed to

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[33] Ibid., pp. 57-62.

[34] Ibid., pp. 63-65.

[35] University of Illinois, Office of the President, Faculty Letter, No. 51 (February 7, 1963).

ease the transition from the semester to split third-term plan.

Principles Governing Calendar Revisions

Calendar revisions should not be undertaken lightly. If the academic calendar is viewed as one of the means of achieving an institution's educational goals, then revisions should likewise be considered if they enable an institution to meet its problems and attain its objectives more successfully.

Recently many institutions have studied the possibilities of calendar revisions; some have actually changed their calendars so as to operate facilities on a year-round basis. Underlying these changes are a number of principles commonly mentioned by institutions.

Some of these principles are similar to the basic considerations in redesigning the public school year, but a few are different largely because the higher education enterprise is characterized by greater flexibility for both students and professors. The compulsory nature, for example, of public school attendance makes it necessary for pupils to be assigned their terms of attendance, while college students, it is generally felt, should be free to select not only their terms of attendance but to decide their own credit loads.

This section briefly discusses principles which should be considered in revising the academic calendar of universities. For the convenience of the reader, these principles are arbitrarily placed under one of the following headings, although several may be affected: (a) students, (b) faculty, and (c) administration.

Students

A university's student body is complex in nature. It is composed of students (a) with different academic interests, (b) in varying stages of development, and (c) with the resources or desire to undertake college work on a full or part-time basis. Any change in the academic calendar should offer current, if not better, academic opportunities for all these groups of students. A year-round calendar would result in the additional need to provide for students who wish to accelerate their work as well as for those who do not.

> . . . Students should be given the maximum flexibility in entering upon their college program, in pursuing their educational goals within this program, and in graduating. Each student should proceed at the pace best suited to him, which, in the majority of cases, might approximate the present academic schedule. The program should be sufficiently flexible to permit the acceleration of exceptionally motivated, able, and mature individuals; while providing for an even slower rate of progress than under the present system for those students for whom such a program would be desirable.
>
> Under any such flexible system, counselors would have a new responsibility--that of advising students to find their best pace. . . .[36]

Furthermore, the objectives of summer sessions need clarification, so that curriculum offerings serve the summer clientele adequately.

As noted earlier, an effective year-round calendar requires equivalent curricular offerings each term. Until the enrollments in the three terms are similar, this goal is difficult to achieve. However, if all terms have equally attractive and rich offerings, the probability of achieving balanced enrollments is increased.

Since college life should be more than classroom pursuits, consideration needs to be given to the

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[36]University of Michigan, Report, p. 18.

extracurricular activities during all terms. While it is desirable that these activities be equally varied in all terms, it is not necessary that there be identical activities. As a matter of fact, certain activities seem more appropriate to particular terms, especially in areas where the climate is a factor. However, such undertakings as the school newspaper, lecture series, concert series, and foreign film series should be scheduled on a year-round basis.

Faculty

Of primary importance is faculty involvement in evaluating the need for calendar revisions and in participating in the actual revisions. Time and again, this advice is reiterated. The University of Pittsburgh exemplifies an institution which involved the faculty, together with administrative officers, from the very beginning in calendar studies.

In redesigning the academic calendar, the employment conditions for faculty members should not deteriorate. Present provisions should be maintained, if not improved. The faculty should be given as much flexibility as possible to plan for teaching, research, and recreational periods. Additional teaching should be compensated. However, it might be helpful to develop some limits on the amount of additional teaching one should undertake.

Administration

Although the administrative staff currently is employed for a twelve-month period, year-round operations will undoubtedly affect the work load of the administration. Among the many objectives to be pursued are the following:

1. Registration procedures should be streamlined and made more efficient.
2. The calendar should provide for adequate breaks between terms and for exam periods in each term.

3. Articulation of the calendar with that of other colleges (and secondary schools) should be encouraged.
4. The student fee structure should be revised.
5. Plant maintenance, repairs, and construction should be scheduled so as to minimize interference with the academic program.

A final consideration is the cost factor. Although calendar revisions are made so as to achieve educational objectives, the financial situation can not be ignored. Any calendar revision is costly to some extent.

> . . . The high cost is made up of the time of the number of people that must be assigned to work on the change, the printing of the multitude of revised forms and publications necessary, and the cost of communication and publicity to all interested parties. . . .[37]

Since year-round operations involve an increase in the student load and necessitate additional teaching time and greater use of auxiliary services, more funds will be needed. On the other hand, continuous use of the physical plant and many service departments will result in certain economies. Consequently, while the total operating costs of an institution may be substantially increased under year-round operations, the cost of educating a student may be decreased. To some extent, the magnitude of the decrease will depend on how skilfully the year-round program is administered.

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[37]AACRAO, op. cit., pp. 21-22.

Chapter V
IMPLICATIONS FOR HAWAII

Previous chapters in this report have summarized the literature dealing with year-round operations of public elementary and secondary schools as well as of institutions of higher education and have discussed some of the essential principles which should guide calendar revisions. An exploration was also made of the feasibility of adopting the four-quarter rotation plan by Hawaii's public school system. This chapter presents some implications which affect both the public school and higher education systems.

The Public School System

The academic calendar can be evaluated in several ways. This section discusses several factors which should be considered in such an evaluation, among which are the following: (a) year-round operations, (b) summer activities, and (c) quality education.

Year-Round Operations

Both the literature dealing with the past experiences of school systems which adopted the four-quarter rotation plan and the recent studies which explored the advisability of such an academic calendar indicate the difficulties involved in year-round operations and, in some ways, offer explanations for the rejection of this schedule by public schools. Furthermore, the hypothetical application of the four-quarter rotation plan to one of Hawaii's public secondary schools (a) illustrates, in greater detail, some of the areas, dealing with the curriculum, teacher and administrative staffing, student activities, and school finance, which would require adjustments and (b) reveals the doubtful value of the plan, even from the

standpoint of economy alone. In view of both national experience and this exploratory feasibility study, it does not seem desirable for Hawaii to adopt the four-quarter rotation plan, which, under present conditions, does not offer sufficient advantages to compensate for the disadvantages. As indicated in Chapter III, a number of serious problems would be created by adoption of the four-quarter rotation plan.

However, year-round operations might be considered by Hawaii under one of several conditions: (a) there is such an extreme shortage of qualified teachers that unless more of them instruct year-round it will be necessary for a large number of students to receive instruction from poorly qualified teachers; (b) there is a community desire to increase teacher salaries but limited funds require that to provide for estimated pupil increases either teachers instruct year-round and receive salary increases proportionate to the extra period of teaching or present teaching conditions and salary provisions be maintained with the hiring of additional teachers; (c) there is evidence that year-round operation is a necessary feature of an effective educational system. Under such conditions, the four-quarter rotation plan might be re-evaluated, together with other year-round operation calendars, in order to select the one which is most advantageous for Hawaii.

Summer Activities

It would be informative to obtain data on how both students and teachers spend their summer in terms of the extent of participation in organized summer activities and the nature of these activities. The legislative reference bureau attempted to obtain as much information as possible, but data are not available on the summer activities of teachers except for those who teach in the public summer sessions. Neither is there information on

the degree to which teachers "moonlight". The bureau's efforts were confined to the following data which were available:

1. The department of labor and industrial relations reports that child labor certificates, which are issued to permit minors under 18 years of age to be employed, numbered 7,312 in the summer of 1962 and 7,876 for the preceding summer. See Table 6 for detailed information.

Table 6

NUMBER OF CHILD LABOR CERTIFICATES ISSUED BY THE DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS STATE OF HAWAII SUMMER 1961 AND 1962

Type of Employment	Oahu		Hawaii-Maui-Kauai		State	
	1961	1962	1961	1962	1961	1962
Agriculture	482	416	1,072	1,060	1,554	1,476
Construction	215	192	22	22	237	214
Manufacturing	2,802	2,766	822	588	3,624	3,354
Wholesale	24	113	12	19	36	132
Retail	1,367	1,177	156	119	1,523	1,296
Transportation	26	46	6	11	32	57
Services	439	582	47	117	486	699
Finance, Insurance, Real Estate	19	38	1	3	20	41
Other	346	42	18	1	364	43
Total	5,720	5,372	2,156	1,940	7,876	7,312

Source: Hawaii, Department of Labor and Industrial Relations.

2. Data on summer session enrollments in the public schools for the last three years indicate that an increasing percentage of the student population is attending summer school. In 1961 there were 8,970 students (6.8 per cent of the total student population) attending the summer program; in 1963 there were 13,249 (9.5 per cent). It is also interesting to note that about 20 per cent of high school students are in summer school while less than 5 per cent of elementary students are. During this period the proportion of teachers engaged in summer session teaching increased from 8.9 to 12.1 per cent of the teaching force. See Table 7 for detailed information on the number of schools, teachers, and students engaged in summer programs. The summer tuition is $28, $30, and $40 for elementary, intermediate, and high schools (full credit courses), respectively.

3. An exploratory survey of enrollments in 1962 summer programs sponsored by various agencies on Oahu reveals the following statistics:

Program	Enrollment
Honolulu City and County Parks Board	5,100
YWCA and YMCA	8,470
Parochial schools	8,754
Other	1,962
TOTAL	24,286

This total is somewhat inflated since some of these figures include the enrollment for each class in the program, and not the registration of each individual. However, this evidence of participation in summer activities is pertinent.

Exactly how many public school students participate in academic, cultural, recreational, or other organized summer programs is not known, but the above data, which are admittedly incomplete, reveal that many students take advantage of organized activities during the summer. This is probably related to the fact that a relatively high

Table 7

NUMBER AND PERCENTAGE OF SCHOOLS, TEACHERS, AND STUDENTS ENGAGED IN SUMMER PROGRAMS UNDER THE DEPARTMENT OF EDUCATION, BY GRADE LEVEL AND ISLAND 1961-1963

Grade Level and Island	Number of Schools			Number of Teachers*			Number of Students		
	1961	1962	1963	1961	1962	1963	1961	1962	1963
Elementary									
Hawaii	--	3	3	--	13	14	--	219	292
Kauai	1	--	2	10	--	6	206	--	180
Oahu	13	20	18	114	177	176	2,336	3,628	3,891
Intermediate									
Hawaii	--	--	1	--	--	1	--	--	19
Kauai	--	--	1	--	--	2	--	--	35
Oahu	8	9	11	82	106	132	2,022	2,551	2,964
High									
Hawaii	1	1	2	23	20	24	417	372	517
Kauai	3	3	3	17	34	29	240	740**	519**
Maui	3	3	3	27	30	28	518	529	603
Oahu	8	10	14	150	155	205	3,231	3,434	4,229
TOTAL: Summer	37	49	58	423	535	617	8,970	11,473	13,249
Per Cent of Total Number Under the Department of Education	18.8%	24.5%	28.8%	8.9%	10.9%	12.1%	6.8%	7.9%	9.5%

Source: Hawaii, Department of Education, Business Office and Office of Research and Statistics.

*Includes teacher-directors.

**Includes 124 students from the mainland.

proportion of mothers in Hawaii work. According to the 1960 census report on Hawaii, 40 per cent of married women are employed.[1] This circumstance, coupled with the data on students' summer activities, may be indicative that a greater number of students might take advantage of educational opportunities during the summer if they are appropriate and available, and, especially, if they are offered with no tuition. It is also pertinent to note that more teachers apply for summer teaching than are hired.

Whether the department of education should be concerned with what happens to students during the summer months and whether the public school system has any responsibility during the summer for offering varied educational opportunities for students require value judgments. Furthermore, should such opportunities benefit only students who can afford to pay for, or who are motivated to take advantage of, such opportunities?

Answers to the following queries would be relevant but not easily found: (a) What kinds of students would gain most from summer school attendance and what proportion of such students are currently enrolled? (b) To what extent are limited financial resources a barrier to participation in organized summer activities? These and other similar data would enable the department of education to evaluate the adequacy of its summer programs and to determine whether they should be expanded and whether they should be subsidized by student tuition alone.

Quality Education

While a re-evaluation of summer school programs could conceivably result in modifications in the academic

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[1]U. S. Bureau of the Census, U. S. Census of Population: 1960, Hawaii, Detailed Characteristics (Washington, D. C.: Government Printing Office, 1962), p. 13-170.

calendar, another approach is to cope with the basic question: Is a 180-day school year[2] adequate for meeting the current demands of quality education? In this connection, it is interesting to note, as indicated earlier in Chapter II, that a number of school systems have extended the length of their school years. Recently some of Florida's schools established a longer school year.

> Last year the University School in Tallahassee, Florida, adopted a revolutionary program which combined an 11-month school year, longer class periods, Saturday and evening classes, and a non-graded program from first grade through high school graduation.
>
> This week in Fort Lauderdale, Florida a similar plan went into effect at Nova School, with 1,500 pupils in grades 7 through 10.
>
> Both schools have a 220-day calendar. Because state law requires only 180 days, enrollment is voluntary. Despite this, both schools report more applications for admission than they can accommodate.
>
> Joe Hooten Jr., director of the University School, believes the 11-month school year will spread across the nation.
>
> "There is so much to learn today, and so little time in which to learn it," he said in an interview. "Horse-and-buggy education isn't going to prepare our youngsters for the space age."[3]

Whether Hawaii should similarly undertake such a program is beyond the scope of this report. However, a

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[2] In practice, the 180-day minimum, however, is reduced by activities which result in dismissing all of the students for part of or for the entire day such as teachers' meeting day, teacher-parent student progress conferences, and emergencies (impending storms or tidal waves). In addition, students are released from classes on a rotation basis for activities such as cafeteria service and in some schools, library, office, and yard duties.

[3] Honolulu Star Bulletin, September 11, 1963.

constant and alert awareness of the need for periodic evaluation, leading to effective and comprehensive studies of the school program, can only result in improving public education in Hawaii.

The Higher Education System

Although public higher education in Hawaii is presently confined to the University of Hawaii and its Hilo campus, there is the possibility that a system of higher education will develop in the future with the establishment of community colleges. The literature oftentimes indicates that when new institutions are being planned, attention should be given to the feasibility of year-round operation. Should Hawaii initiate a community college program, it might be desirable, during the initial planning stage, to consider the need for and effects of year-round operation.

Recently the University of Hawaii established, through legislative authorization and financial support, an Academic Master Plan Committee to implement a legislative request that it "formulate a comprehensive, long-range plan for the development of curriculum and academic programs at the University and . . . estimate the costs involved . . ."[4] Although this Committee is familiar with current year-round operations in Mainland institutions, the Committee has made no recommendations for immediate study or implementation of such a calendar. However, it is likely that the University will explore this matter in the future as one means of meeting estimated increases in enrollments.

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[4]State of Hawaii, 1963 Legislature, Conference Committee Report No. 2 on H.B. 2 (appropriation bill).

Summer Sessions

Data on summer session enrollments at the University of Hawaii (Table 8) indicate that an increasing number and proportion of the University's undergraduate student population are attending summer school. In 1959, for example, 1,677 undergraduate students, attending the summer session, were candidates for U. H. degrees; this represented 31.9 per cent of the 1958-59 undergraduate population (full-time equivalent students). In 1963, the number grew to 2,919 undergraduate students or 39.9 per cent of their group. Whether these undergraduate students were accelerating their attainment of the baccalaureate degree, making up deficiencies, enjoying this extra opportunity for enrichment, or just finding something to do is not known. This increase in undergraduate attendance may reflect a mainland trend also: "Freshmen increasingly are entering state universities in June, immediately after high school graduation, rather than waiting until the traditional September entry time, but the trend is still gradual."[5] How much of Hawaii's undergraduate summer enrollment is due to entering freshmen is not known, but this number will probably increase even further when the University's summer session office undertakes its contemplated plans to publicize summer course offerings more intensively and widely among Hawaii's high schools.

Statistics on graduate students, attending the summer school and working for advanced degrees (either a master's or doctor's) from the University of Hawaii, show that there has been a large increase in number but a slight decrease in the proportion of the graduate student population. In 1959 there were 132 graduate students

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[5]Association of State Universities and Land-Grant Colleges and State Universities Association, Joint Office of Institutional Research, "For Your Information", Circular No. 42 (September 12, 1963), p. 1.

Table 8

NUMBER OF UNIVERSITY OF HAWAII
UNDERGRADUATE AND GRADUATE DEGREE CANDIDATES
ENROLLED IN THE SIX-WEEK SUMMER SESSIONS*
1959-1963

Degree	Student Enrollment				
	1959	1960	1961	1962	1963
GRADUATE					
Advanced Degree	132	169	169	343	440
5th-Year Diploma	217	252	209	220	196
Sub-Total	349	421	378	563	636
UNDERGRADUATE					
Agriculture	56	87	85	92	127
Arts and Sciences	541	661	743	898	1,177
Business Administration	213	206	245	305	401
Education	565	659	730	755	829
Engineering	218	252	265	250	265
Nursing	84	60	85	107	120
Sub-Total	1,677	1,925	2,153	2,407	2,919
TOTAL	2,026	2,346	2,531	2,970	3,555

Source: University of Hawaii, Office of Summer Session.

*This table does not include data on summer session students who were not candidates for University of Hawaii degrees. The total Manoa summer session registration figures for the period 1959 through 1963 are 5,706; 6,214; 6,665; 7,239; and 7,983, respectively.

attending the summer session who were working for advanced degrees at the University; this represented 44.6 per cent of the advanced degree candidates. In 1963 the number grew to 440 graduate students who comprised 42.7 per cent of their group. Part of the explanation for the slight decrease in the percentage of graduate students may lie in the fact that the increase of advanced degree candidates from 296 in 1958-59 to 1,031 in 1962-63 is partially due to the East-West Center student program. During the summer, however, many EWC students initiate their study programs on the Mainland or in the Orient. Another factor may be the nature of summer session offerings; it may well be that graduate students in certain fields have limited opportunities during the summer to enroll in appropriate courses.

It is evident that both undergraduate and graduate degree students attend the summer session in rather large numbers. Among the reasons for this may be the extensive course offerings in certain departments and the University's ability to attract a competent staff of both resident and visiting faculty. The influx of Mainland students oftentimes results in a summer session enrollment equal to or slightly in access of the academic year enrollment; such enrollments enable the University to offer a relatively large number of courses in comparison to the summer program of sister institutions on the Mainland.

In evaluating the effects of the summer session on acceleration, it would be helpful to explore the degree of consideration presently given to acceleration possibilities in the planning of summer session offerings as well as to obtain data on the proportion of recent graduates who were able to accelerate their studies because of summer session attendance. Such information would be helpful in determining, if and when the need arises, whether the University of Hawaii should retain

its semester schedule and expand its summer session, or initiate another academic calendar for year-round operation.

Year-Round Operations

Somewhat unrelated to the above data is the theoretical question: Should it normally take four years, or three, to attain the baccalaureate degree? Grayson Kirk, President of Columbia University, is among those who believe that college should be completed in three years and that "the trimester plan will promote better student attitudes toward this serious business of acquiring an education."[6] Kirk also indicates that year-round operation for acceleration purposes would be "unthinkable [in the elementary schools] for the pressures it would impose on young children. High schools are in an upheaval that precludes an early remedy . . ."[7]

Higher education institutions oftentimes undertake year-round operation not only to accommodate student increases but also to enable student acceleration. On the college level, graduation at an early age is especially advantageous for those who go on to graduate or professional schools. Should balanced enrollments during all terms be desired under year-round operation, articulation with the typical two-semester high school calendars would be helpful but difficult, unless the semester plus expanded summer session, quarter, or split third-term plan were adopted by the University. It is evident that calendar revision is not a simple mechanical undertaking and should be initiated only for good reason and adopted only after careful consideration of the many implications and consequences of such a change.

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[6]Grayson Kirk, "College Shouldn't Take Four Years", Saturday Evening Post 232 (March 26, 1960), p. 109.

[7]Ibid., p. 112.

Appendix A

PLANS REQUIRING THE EXTENSION
OF THE SCHOOL YEAR

1. Enriched Summer School Plan

The enriched summer school plan generally provides for an independent, extensive, voluntary summer program of 6-12 weeks and enables the student to: (a) accelerate in some field of study such as mathematics, foreign language, or science; (b) enrich and enlarge upon experiences offered during the regular school program; (c) repeat subjects as necessary; (d) do remedial work in his area of weakness; or (e) engage in cultural or recreational activities of some kind.

Advantages

Perhaps the most attractive feature of this plan is its acceptability to all concerned: students, teachers, parents, and administrators. Preserving the traditional school pattern and allowing the students and teachers a choice in the matter of participation probably account for the popularity of this plan. Furthermore, the students are given some opportunity to use the summer term in any way that best fits their individual needs, interests, and goals.

Other advantages are: (a) there is a greater utilization of and therefore a greater return on the buildings already constructed; (b) some teachers are able to better their economic status; and (c) a shorter vacation may be more wisely used and may reduce loss in learning.

Disadvantages

Although the enriched summer plan generally involves additional costs, some school systems offset these costs by charging a tuition for the summer term. This charge may be a disadvantage, for it may represent a prohibitive sum to some students who should not be deprived of the opportunity to participate in the program.

A further disadvantage is found in what is considered its strength: voluntary participation. Some argue that if a relatively small percentage of students participate, the return on the investment may not be as great as anticipated. Others point out that the optional nature of the summer plan may result in very low enrollment of students who conceivably might profit most from enrichment experiences.

Still others maintain that schools with summer programs are adding more to their already heavy responsibilities and shouldering a responsibility that belongs to the parents. Such critics point to the lack of opportunity for teachers to engage in professional improvement activities and to the possible curtailment of social activities for students.

2. Extended Pupil School Year Plan

Under this plan, school will be in session for 210-220 school days or approximately 11 months. This extended school year may be organized into two, three, or four terms with a one-month vacation scheduled at the end of the school year or distributed among the terms.

Proponents of this plan argue that the present 180-day school year cannot meet today's minimal educational needs and maintain that if quality education is to be preserved, extra time is essential. This plan was not formulated to accelerate students.

A nation-wide sampling of superintendents' opinions in 1958 indicated that 65 per cent favored extending the school year, 33 per cent favored maintaining the present school calendar, and 2 per cent expressed no opinion. The number of days to be added to the present school year ranged from 5 to 100 days, with the majority favoring an extension of 20 days.[1]

George Gallup, in a poll conducted in 1961, however, received an opposite response from parents.[2] Opposing any plan to extend the school year were 70 per cent of the parents of elementary school students and 64 per cent of the parents of high school students.

Advantages

Of the numerous reasons for advancing this plan, the primary one has already been discussed: this plan would

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[1]Nation's Schools, "Lengthening of School Year", Nation's Schools 62 (December 1958), p. 6.

[2]George Gallup, "Parents Veto Longer Terms for Students", Minneapolis Sunday Tribune (April 16, 1961) as found in: National Education Association, Research Division, "The All-Year School", Research Memo 1962-2 (Washington, D. C.: the Association, January 1962), p. 2.

meet the desire and need to maintain quality education by providing both extensive and intensive coverage of the scientific branches of learning without abandoning or neglecting the obvious need and benefits of studying the basic courses in the humanities.

Second, a fuller use of school buildings and facilities means a greater return on an investment already made. Having costly school buildings lie idle for one-fourth of the calendar year has always seemed to be a great waste to many economy-minded citizens.

Third, teacher morale, it is envisioned, will be substantially raised. An 11-month school year with a one-month paid vacation would result in year-round employment for teachers with concomitant salary increases. A more extended period of professional employment at professional salaries would mean that teachers would no longer need to engage in non-professional part-time occupations to supplement their "professional" earnings. Both the economic and professional status of teachers would thus be improved.

Fourth, the plan will keep students occupied. The need for the traditional 12-week summer vacation has been seriously questioned. Today's mechanized economy--even in agricultural endeavors--no longer justifies a three-month vacation for pupils since they are no longer needed to help with home and farm chores. For many students, the summer months pose the problem of how best to keep busy.

Fifth, as a corollary to the fourth point, a shorter vacation may be more beneficial and advantageous than a longer one. Such a vacation may coincide more closely with the length of family vacations which may be approximately one month. In addition, it will also reduce the amount of loss of learning that takes place during a prolonged rest.

Disadvantages

While critics of this plan acknowledge the need for quality education, they feel that an extended school year in itself is not a guarantee; the 30 or 40 extra school days may mean just "more of the same"--quantity but not quality. (Some critics feel, therefore, that other means, such as the enriched summer program, might be more beneficial.)[3]

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[3]Robert S. Gilchrist and Edwin R. Edmunds, "The Value of an Independent Summer Program", Theory Into Practice I (June 1962), pp. 162-65.

Another major disadvantage is the cost factor. An extended school year means additional costs in the form of payment for two extra months to most professional personnel connected with the operation of schools--teachers, some members of the administrative staff and, where applicable, to other non-professional employees--clerks, secretaries, custodians, cafeteria workers, bus drivers, and maintenance workers. In some parts of the nation, air conditioning may also be essential.

Another disadvantage is the negative reaction of many parents and students because the plan reduces sharply the traditional vacation period. This may deprive students from participating in other wholesome activities during the summer months, such as camping. Family vacations may also be difficult to arrange.

Furthermore, teachers, in spite of the promised increment in salary and status, do not all welcome this plan. The New York State Teachers Association, in its meeting in November, 1959, argued, "Since good teaching entails a considerable degree of nervous strain, teachers must have time for rest and recuperation....Teachers must keep up with the advances in knowledge so that pupils will learn more...Without scholarship, research and creative thinking, teaching becomes mediocre and repetitious."[4] Obviously, an extended school year would mean that teachers may have to curtail their various professional activities usually undertaken during the summer. The extent to which teachers engage in "scholarship, research and creative thinking", however, is not known.

3. Extended Professional School Year Plan

The extended professional school year plan attempts to meet two important educational goals: (a) an enriched summer program for students; and (b) a program for encouraging the professional growth of teachers and for improving their professional and economic status.

Since the enriched summer program has already been described in the previous section, this portion will deal primarily with that aspect of the plan dealing with the professional growth of teachers. Although details of the plan may vary with different systems, this plan generally provides that teachers with two years of successful

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[4]Grace and Fred Hechinger, "Should School Keep All-Year Round?" New York Times Magazine (January 24, 1960), p. 25.

teaching may be hired for 12 instead of 10 months if they express a wish to participate in the program and if they are willing to meet certain professional obligations during the extra two-month period.

Advantages

School systems that have adopted this plan have found that the overall educational program, the pupils, and the teachers all have benefitted. Better education resulted from the workshops in curriculum evaluation, textbook selection, school policy review, testing procedures, promotion policies, as well as workshops in specific subject-matter areas.

A rise in student achievement was noted at Rochester, Minnesota, which adopted this program in 1946.[5] Test results (Iowa Tests of Educational Development) showed the school-wide average to be in the top 8 per cent of all high schools that were tested throughout the country. It is interesting to note that 90 per cent of the parents surveyed in 1958 expressed great satisfaction with the program.

This plan is the most advantageous to the teacher who is offered increased annual earnings and the opportunity for professional self-improvement. The community also benefits. Year-round employment makes it unnecessary for teachers to seek summer jobs outside the community, making year-round residence in the community possible. For the community, a program of this nature means better utilization of two of its resources: school buildings and teachers.

Disadvantages

This program generally increases the school budget by 10 to 20 per cent.[6] Lexington, Kentucky, abandoned the program after 11 years for financial reasons and replaced it with a 190-day school year. Officials felt that expending 17-18 per cent of the school budget on this program was excessive. However, the program was

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[5]Paul Friggens, "Year-Round School", National Parent Teacher 53 (April 1959), pp. 7-9.

[6]However, the experience of Rochester, Minnesota, is somewhat different. Rochester found that this program increased the cost of its annual education budget of about $3,000,000 by $100,000 to $150,000. National Education Association, Research Division, op. cit., p. 7.

discontinued with the realization that certain advantages were being sacrificed.

While the public may support the idea of raising the professional and economic level of teachers through year-round employment, the public may not be receptive to the idea of expending public money for the professional improvement of teachers unless it can be shown that such an investment will bring sufficient returns. Such returns are not easily guaranteed.

As in the program for summer enrichment, the voluntary nature of the plan may mean a relatively limited degree of participation, and many students who would profit from this program might not be enrolled for either lack of finances if a fee is charged or for lack of motivation.

Appendix B

ILLUSTRATIVE SCHEDULING OF REQUIRED
NINTH-GRADE ENGLISH UNDER THE PRESENT CALENDAR
AND THE FOUR-QUARTER ROTATION PLAN
1963-64

Note: These schedules are based on the following assumptions:

A. Present Calendar

1. There will be 758 ninth grade students in 1963-64.

2. A year's work in English is composed of English 1 and English 2, taken during the first and second semesters, respectively.

3. On the basis of a 32:1 pupil-teacher ratio, 24 sections will be necessary.

4. Each teacher of English instructs for five periods and supervises study hall during the remaining period.

B. Four-Quarter Rotation Plan

1. There will be four groups of ninth graders--190 in each, with 570 being in attendance each quarter.

2. A year's work in English is composed of English 1, English 2, and English 3, taken during the student's first, second, and third quarters of work, respectively.

3. The 32:1 ratio will be maintained.

4. Teachers will instruct for five periods.

5. Some teachers will be teaching for three quarters; others will also teach during the fourth quarter.

A. Present Calendar

Class Period	Semester I Teachers					Semester II Teachers				
	V	W	X	Y	Z	V	W	X	Y	Z
1	Study Hall	Eng.	Eng.	Eng.	Eng.	Same as Semester I				
2	Eng.	Study Hall	"	"	"					
3	"	Eng.	Study Hall	"	"					
4	"	"	Eng.	Study Hall	"					
5	"	"	"	Eng.	Study Hall					
6	"	"	"	"	Elec-tive					

24 sections required
4 full-time teachers
1 part-time teacher with 1 elective

B. Four-Quarter Rotation Plan

Class Period	Quarter I Teachers				Quarter II Teachers				Quarter III Teachers				Quarter IV Teachers			
	V	W	Y	Z	V	W	X	Z	V	W	X	Y	X	Y	Z	V
1	Study Hall	Eng.1	Eng.1	Eng.1	Study Hall	Eng.2	Eng.1	Eng.2	Study Hall	Eng.3	Eng.2	Eng.2	Study Hall	Eng.3	Eng.3	Eng.3
2	Eng.1	Study Hall	"	"	Eng.2	Study Hall	"	"	Eng.3	Study Hall	"	"	Eng.3	Study Hall	"	"
3	"	Eng.1	Study Hall	"	"	Eng.2	Study Hall	"	"	Eng.2	Study Hall	"	"	Eng.3	Study Hall	"
4	"	"	Eng.1	Study Hall	"	"	Eng.1	Study Hall	"	"	Eng.2	Study Hall	"	"	Eng.3	Study Hall
5	"	"	"	Elec-tive	"	Elec-tive	"	Eng.2	"	Elec-tive	"	Eng.2	"	"	"	Elec-tive
6	"	"	"	Elec-tive	"	Elec-tive	"	Eng.1	"	Elec-tive	"	"	"	"	"	Elec-tive
	English 1 - 18 sections				English 1 - 6 sections English 2 - 12 sections				English 2 - 12 sections English 3 - 6 sections				English 3 - 18 sections			
	3 full-time teachers 1 with 2 electives				2 full-time teachers 1 with 2 preparations 1 with 2 electives				3 full-time teachers 1 with 2 preparations and 2 electives				3 full-time teachers 1 with 2 electives			

Group A - assigned to teacher V (5 groups) and teacher W (1 group) = all group A students with one teacher

Group B - assigned to teacher X (5 groups) and teachers Z, W, Z (1 group) = five group B students with one teacher, one with two teachers

Group C - assigned to teacher Y (5 groups) and teachers W, W, V (1 group) = five group C students with one teacher, one with two teachers

Group D - assigned to teacher Z (3 groups) and teachers W, W, V (2 groups) and teachers W, Z, Z (1 group) = three group D students with one teacher and three with two teachers.

Appendix C

ILLUSTRATIVE SCHEDULING OF ALGEBRA 1-2
USING TWO DIFFERENT APPROACHES UNDER THE
FOUR-QUARTER ROTATION PLAN

Note: Approach 1 involves the use of two teachers instructing 12 sections in Algebra 1-2-3, with both working for four quarters. The teaching preparations for these two teachers are almost solely in this subject, and all students are able to complete a year's work under one teacher.

Approach 2 involves the use of three teachers, each working for three quarters. Three groups of students can complete their year's work in Algebra 1-2-3 with one teacher. The teaching preparations for the three teachers, however, will be varied.

Both approaches require the following number of sections:

	Quarter I*	Quarter II	Quarter III	Quarter IV
Algebra 1	Group A - 3 sections Group C - 3 sections Group D - 3 sections	Group B - 3 sections	---	---
Algebra 2	---	Group A - 3 sections Group D - 3 sections	Group B - 3 sections Group C - 3 sections	---
Algebra 3	---	---	Group A - 3 sections	Group B - 3 sections Group C - 3 sections Group D - 3 sections

*The following abbreviations are used to indicate teacher scheduling:

A, B, C, D: the group of students
1, 2, 3: the quarter of work in Algebra

Approach 1

Period	Teacher 5				Teacher 6			
	Q. I	Q. II	Q. III	Q. IV	Q. I	Q. II	Q. III	Q. IV
1	A-1	A-2	A-3	Other	Other	B-1	B-2	B-3
2	A-1	A-2	A-3			B-1	B-2	B-3
3	A-1	A-2	A-3			B-1	B-2	B-3
4	C-1	Other	C-2	C-3	D-1	D-2	Other	D-3
5	C-1		C-2	C-3	D-1	D-2		D-3
6	C-1		C-2	C-3	D-1	D-2		D-3

Approach 2

Period	Teacher 5				Teacher 6				Teacher 7			
	Q. I	Q. II	Q. III	Q. IV	Q. I	Q. II	Q. III	Q. IV	Q. I	Q. II	Q. III	Q. IV
1	A-1	A-2	A-3	V	V	B-1	B-2	B-3	C-1	V	C-2	C-3
2	A-1	A-2	A-3	A	A	B-1	B-2	B-3	C-1	A	C-2	C-3
3	A-1	A-2	A-3	C	C	B-1	B-2	B-3	C-1	C	C-2	C-3
4	D-1	D-2	Other	A	A	Other	Other	Other	Other	A	Other	D-3
5	D-1	D-2		T	T					T		D-3
6	D-1	D-2		I	I					I		D-3
				O	O					O		
				N	N					N		

Appendix D

ILLUSTRATIVE SCHEDULING OF
TRIGONOMETRY AND SOLID GEOMETRY UNDER
THE FOUR-QUARTER ROTATION PLAN

Note: Trigonometry and solid geometry are presently one-semester (90-hour) courses. Although these courses are taught as a pair, either subject may be presented first. Thus solid geometry and trigonometry may both be offered during alternate quarters as one-quarter double-period courses without regard for sequence. Furthermore, although this plan means 30 fewer days, the "double-period" arrangement increases the actual class hours by 30 hours to a total of 120 hours--a circumstance which may introduce problems unless the present curriculum is re-evaluated and possibly changed in some way to provide for the longer period of study or the period schedule modified to provide equivalent total hours of instruction.

Two approaches, first with one teacher on a three-quarter teaching schedule and, second with one teacher on a four-quarter schedule, were explored. Both plans were made on the assumptions that:
(a) as in 1962-63, about two per cent of the student body will register in these classes; and
(b) one teacher will handle these classes.

Plan A allows the teacher to take her vacation of one quarter and still handle all of the classes. Based on past experience, the enrollment each quarter will probably be too large for one class, but conceivably insufficient to create two full-sized classes. However, since the maintenance of quality education is one of the expressed goals, two classes, smaller in enrollment than under the present calendar, will be established. Furthermore, as a further justification of this approach, qualified students completing second-year algebra may be allowed to enroll in solid geometry and trigonometry during the third quarter when attendance is expected to be low--only Group A will be taking trigonometry, and only Group B will be taking solid geometry.

Under plan B, the teacher is scheduled to teach all four quarters. Trigonometry and solid geometry will be offered to two of the three attending groups each quarter. This eliminates the necessity of establishing two classes with rather small

enrollments and makes it possible to establish one full-sized class each quarter. It further "frees" the teacher to offer other courses in higher math. The latter, especially, is a noteworthy consideration since qualified teachers in higher mathematics are scarce. A possible disadvantage is the assignment of Groups A and B to the third quarter for enrollment in these classes.

Under both approaches, one teacher will be able to handle all four groups. However, under the first plan, the teacher will have two relatively small classes each quarter and qualified students are permitted to be accelerated in their mathematics program.

Miss Maizie Yamada prepared the manuscript for printing.

Plan A

(One teacher with a three-quarter teaching assignment)

Period	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1 & 2	Trig Groups B, C, D (Group A: vacation)	Solid Groups A, C, D (Group B: vacation)	Trig Group A plus other students from second-year algebra who qualify for this class	VACATION
3 & 4	Trig Groups B, C, D (Group A: vacation)	Solid Groups A, C, D (Group B: vacation)	Solid Group B plus other students who qualify	
5 & 6	Other math courses			

Plan B

(One teacher with a four-quarter teaching assignment)

Period	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1 & 2	Trig Groups C & D	Solid Groups C & D	Trig Groups A & B	Solid Groups A & B
3				
4				
5	Other math courses			
6				