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ABSTRACT

This report is based on 144 questionnaires sent to past participants of the nine National Science Foundation Academic Year Institutes (AYI) for Junior High School Teachers of Mathematics held at San Jose State College, 1962-1970. The questionnaires, sent to each participant in May of the year following completion of their institute, lists 25 activities the teachers may have conducted in their school districts. The activities include: intensive workshops, enrichment lectures, materials files, television teaching, school professional library, and others. Each activity on the questionnaire is discussed in this report and the percent average response to each one is given. Eleven recommendations are made for improvement of future AYI sessions at San Jose State College. (BB)

A FOLLOW-UP STUDY OF THE PARTICIPANTS OF THE NINE NATIONAL SCIENCE FOUNDATION ACADEMIC YEAR INSTITUTES FOR JUNIOR HIGH SCHOOL TEACHERS OF MATHEMATICS HELD AT SAN JOSE STATE COLLEGE, 1962 to 1970

A Research Paper

Presented to

the Faculty of the School of Education

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In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

Joseph G. Merkel

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CHAPTER 1

THE INTRODUCTION AND DEFINITION OF TERMS USED

INTRODUCTION

Our world is in a state of constant change, since the introduction of high speed computers and modern technology changes will occur even more rapidly. Within the past few years heart transplants have become fairly common and man has twice walked on the moon.

> The world today demands more mathematical knowledge on the part of more people than the world of yesterday and the world tomorrow will make still greater demands. Our society leans more and more heavily on science and technology. The number of our citizens skilled in mathematics must be greatly increased; and understanding of the role of mathematics in our society is now a prerequisite for intelligent citizenship.[1]

If education is to keep pace with the demands of our modern and future life, then the school curriculum must also keep pace.

Today the world is divided into two camps, the free or democratic world, and the Communist-controlled world. Three factors will ultimately decide which will win out; these factors are: (1) manpower, (2) natural resources, and (3) technology. In the battle for man's mind our nation

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[1] E. G. Begle, "SMSG: The First Decade," The Mathematics Teacher, LXI, No. 3 (March 1968), p. 239.

does not have the manpower nor the natural resources. We do, however, lead the world in technology and will continue to do so as long as our system of education flourishes. Our nation has no plans to force its democratic way of life upon others, but should we loose our lead or slacken the pace, we could very well loose our freedom.

The Congress of the United States, recognizing the importance of public education, established the National Science Foundation in 1950 as an agency of the Federal government.

> Annual appropriations made by Congress enable the Foundation to carry out its responsibilities to strengthen research and education in science and mathematics.[2]

The National Science Foundation offers three types of institutes, (1) In-Service Institutes, (2) Summer Institutes, and (3) Academic Year Institutes, as well as research grants. Similarly, the National Defense Education Act offers assistance in the areas of education more than toward science and mathematics.

Since 1962 San Jose State College has held nine Academic Year Mathematics Institutes for Junior High School Teachers and Supervisors funded by the National Science Foundation. The program at San Jose not only assisted

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[2] In-Service Mathematics Institute for Junior High School and Senior High School Teachers and Supervisors (Grades 7-12), San Jose, Calif.: San Jose State College, 1969, p. 2.

teachers increase their knowledge of mathematics but was unique among the nation's colleges and universities by also meeting a second objective of having the academic year participants also becoming resource teachers.

> It is expected that as an immediate first result of the Institute there will be an in-service course for an elementary school district near the residence of the participant.[3]

The Problem

Statement of the problem. This study endeavors to (1) explore certain aspects of the nine Academic Year Mathematics Institutes; (2) evaluate the follow-up data from the past nine Institutes; and to (3) make recommendations for improving future programs.

Delimitations of the problem. The scope of this investigation is limited to the nine Academic Year Institutes already held at San Jose State College based on the follow-up questionnaire on file in the Academic Year Institute office. In general, the study was designed to obtain statistical compilation of information that would contribute to an evaluation of the accomplishments of the nine Academic Year Mathematics Institutes.

Specifically, the study is based on questionnaires that participants have answered on programs they have conducted in their school districts since completion of

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[3] Academic Year Mathematics Institute for Junior High School Teachers and Supervisors. San Jose, California: San Jose State College, 1969, p. 2.

the Institute program.

Definitions of Terms Used

AYI. Academic Year Mathematics Institute for Junior High School Teachers and Supervisors, held at San Jose State College.

ERIC. Education Research Information Center.

NSF. National Science Foundation.

Participant. A junior high school teacher or supervisor that has completed or is currently enrolled in the AYI program.

NCTM. National Council of Teachers of Mathematics.

SJSC. San Jose State College, San Jose, California 95114.

Staff. Professors and assistants that conduct courses in the AYI.

CHAPTER 2

RELATED LITERATURE

Many independent studies relating to the evaluation of the Academic Year Institutes have been conducted by both private individuals and governmental agencies. The NSF provided this writer with a six-page list containing some sixty-four evaluations of different Institutes held throughout the United States.

Many evaluations are listed with ERIC (Education Research Information Center), Research in Education, and with Dissertation Abstracts. Eight different evaluations were reviewed by this writer and listed in the bibliography of this report.

> The study was designed to examine and assess the post-institute careers of participants of the first six mathematics Academic Year Institutes at the University of Illinois (hereafter, known as UI-AYI'S), to test certain variables as predictors of relative success in UI-AYI'S, and to obtain from participants an evaluation of their UI-AYI'S experiences tempered by their post-institute experiences.[4]

The writer was unable to locate studies conducted on NSF Academic Year Institutes held at San Jose State College or at other California colleges or universities.

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[4]Howard Leroy Wilson, "A Follow-up on the Participants of the Mathematics Academic Year Institute held at the University of Illinois from 1957 to 1962," Dissertation Abstract, XXVII, (1966) 2092A; LC order no. 66-12, 456.

CHAPTER 3

SOURCES OF THE DATA

This report and evaluation is based on 144 questionnaires sent to past participants of the nine AYI programs which are on file in the AYI office located in the Mathematics Department of SJSC.

Questionnaires were sent to each participant in May of the year following completion of the AYI. It was disappointing to learn that 54% was the highest return of questionnaires for any single year and 30% return average on all nine AYIs.

Poor response from some of the past participants may be due in part to (1) the fact that as yet have not conducted an In-Service Institute and felt unable to respond, or (2) many have changed teaching positions without notifying the AYI office of their new address.

Feeling it would be helpful to follow-up studies of the AYI, a complete list of the nine years of participants and their addresses is included in the appendix of this study.

The returned questionnaires were grouped by year and then tabulated by topic areas showing per cent by both single year and six year (today) average. A table of tabulation of data is shown on page 7 in this chapter.

Tabulation of Data

	1971-72	1970-71	1969-70	1968-69	1967-68		1966-67		1965-66		1964-65		1963-64		1962-63		Six-Year Totals	
	San Jose State Will apply to NSF for funding	SJSC AYI already NSF-funded for 1970-71	1969-70 AYI now in progress, forms due May 1971	1968-69 AYI follow-up to be mailed May 1970	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent Average
1. Intensive Workshop					5	28.4	2	22.1	6	54.6	2	20.0	3	50.0	3	75.0	21	48.8% *
2. Interdist Cooperation					1	7.7	1	10.1	2	18.2	2	20.0	1	16.6	2	50.0	9	21.0%
3. Enrichment Lectures					5	38.4	6	66.7	5	45.5	3	30.0	3	50.0	2	50.0	24	55.6%
4. Articulation Committee					3	23.0	2	22.1	5	45.5	2	20.0	2	33.2	2	50.0	16	37.2%
5. Materials File					1	7.7	4	44.4	6	54.6	2	20.0	2	33.2	4	100.0	19	44.2%
6. Co-op Planning					5	38.4	2	22.1	4	36.4	3	30.0	2	33.2	2	50.0	18	41.9%
7. Co-op Study					2	15.6	2	22.1	2	18.2	1	10.0	1	16.6	1	25.0	9	21.0%
8. Parent Ed Courses					2	15.6	2	22.1	3	27.2	0	0.0	3	50.0	2	50.0	12	27.8%
9. In-Service Courses					4	30.8	1	10.1	3	27.2	2	20.0	2	33.2	2	50.0	14	33.6%
10. Teacher Dis Meetings					6	46.3	5	55.6	4	36.4	4	40.0	3	44.3	3	75.0	24	55.6%
11. New Teacher Conf.					5	38.4	4	44.4	3	27.2	4	40.0	2	33.2	2	50.0	20	46.5%
12. Sch Prof Library					2	15.6	4	44.4	3	27.2	4	40.0	2	33.2	1	25.0	16	37.2%
13. Part Curric Study					7	53.8	4	44.4	7	63.6	6	60.0	3	50.0	2	50.0	29	67.5%
14. Textbook Study					3	23.0	3	33.2	10	91.0	4	40.0	2	33.2	3	75.0	25	58.2%
15. Research Group					1	7.7	2	22.1	0	0.0	1	10.0	2	33.2	1	25.0	7	16.3%
16. Materials Workshop					1	7.7	4	44.4	4	36.4	0	0.0	1	16.6	0	0.0	10	23.2%
17. Experimental Program					6	46.3	7	77.6	5	45.5	3	30.0	2	33.2	1	25.0	24	55.6%
18. Informal Seminar					6	46.3	2	22.1	2	18.2	0	0.0	0	0.0	1	25.0	11	25.2%
19. TV Teaching					1	7.7	0	0.0	1	9.0	2	20.0	1	16.6	0	0.0	5	11.6%
20. Micro Teaching					1	7.7	1	10.1	0	0.0	0	0.0	2	33.2	0	0.0	4	9.3%
21. Test Construction					4	30.8	3	33.2	3	27.2	6	60.0	2	33.2	1	25.0	19	44.2%
22. Film Festival					1	7.7	1	10.1	1	9.0	1	10.0	1	16.6	0	0.0	5	11.6%
23. Field Trips					1	7.7	1	10.1	0	0.0	0	0.0	1	16.6	0	0.0	3	6.9%
24. Local Conference					2	15.6	3	33.2	2	18.2	0	0.0	2	33.2	2	50.0	11	25.3%
25. Math Contest					1	7.7	1	10.1	0	0.0	0	0.0	0	0.0	1	25.0	3	6.9%
No. of Participants	19	24	24	24			24		24		24		24		24		211	total
No. of questionnaires returned				17			9		11		10		6		4		53	

*Per Cent of annual follow-up based on questionnaires returned.

CHAPTER 4

THE TWENTY-FIVE IN-SERVICE ACTIVITIES PARTICIPANTS MAY HAVE DIRECTED SINCE COMPLETION OF THEIR AYI

The twenty-five items are listed one at a time followed by the per cent average tabulated from the returns of 1962 to 1969.

Item 1. Intensive Workshops. (48.8%) At the county or district level, or even within the single school, a mathematics workshop should be offered for teachers of elementary and junior high school mathematics. Participation could be on a voluntary basis, but in the case of teachers with poor math backgrounds or show the need for additional training, their supervisors should require attendance. Sessions would meet at a time and place convenient to any given majority. One hour weekly starting shortly after the close of the regular school day would allow time for teachers to arrive from nearby schools and yet would end early enough for teachers to be home for evening meals.

> Science and mathematics teachers must be provided with the opportunity to keep up to date in their subject field in order to keep pace with the rapid progress and changes which are taking place in these fields.[5]

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[5]Samuel Schenberg, "An Evaluation of the 1958 Summer Institutes Attended by Science and Mathematics Teachers from New York City High Schools," Science Education, XLIII, No. 2 (March 1969), p. 120.

Item 2. Interdistrict Cooperation. (21.0%) Every school district has its own unique problems. However, many problems are common to most schools regardless of geographic location or economic ability. Problems of up-dating curriculum, teacher load, attendance, grading, and homework as well as others may have solutions not tried by some school districts. Interdistrict cooperation would allow a common denominator of common problems, yet each district would be independent to accept or reject polled solutions.

Occasions arise from time to time that would allow interdistricts to borrow or exchange textbooks, visual aids, or equipment that might not be possible if interdistrict cooperation was not tried.

Item 3. Enrichment Lectures. (55.6%) Since 1962 the AYI at SJSC each participant has submitted an "Enrichment Lecture" to the files of the AYI director. The lecture was also presented to interested students and faculty of SJSC at some time during the regular school year. At present over 210 enrichment lectures are available to interested teachers through the director of the AYI.

The enrichment lecture singles out some particular topic in the field of mathematics and presents it in such a way that the syllabus could be followed by most teachers even though not versed in mathematics. Bibliography, charts, and diagrams are also included making it much easier for potential lectures.

Almost every teacher has been asked to talk before a PTA group or some community organization; on occasions students have shown interest in some topic not familiar to the teacher. The enrichment lecture syllabus then is an ideal answer to the problem.

Below is a list of topics included in the enrichment lecture series prepared by the AYI class of 1967-68:

The Discovery Method
Divisibility in Non-Decimal Bases
Prime Numbers
For Good Measure: An Intuitive Introduction to Measurement Using Arbitrary Units
Geometric Construction and Design
Logic for Elementary School Teachers
Rational Numbers: Fractions and Decimals
Subsets of Real Numbers
Introduction to Elementary Probability

During the school year a teacher or student may wish to learn more about a particular topic in mathematics. If such a topic were included in the enrichment lecture series, much valuable time would be saved.

Item 4. Articulation Committee. (37.2%) Most school districts have divided the grades into three distinct groups such as elementary, junior high and senior high, known as the 6-2-4 plan. Articulation committees should meet on these three levels to agree upon the mathematics curriculum so that no serious duplication or vacant gaps occur. Each grade level should be aware of the entrance requirements of the next higher level. Most local school boards and state departments of education have set guide lines to be followed, still without articulation between grade levels. Thus,

many problems could arise.

The high school may have an even larger problem meeting the mathematical needs of their students for some are college-bound and some are not.

The AYI participant is mainly concerned with coordinating mathematics between the elementary and junior high school levels.

Item 5. Material File. (44.2%) If any mathematics program is to remain up-dated, a materials file should be kept. Most classroom teachers keep such a file for their own use. However, it would be a benefit to all if such a file were polled and made available to all math teachers within the same school. In some cases such a file could be made up at the central office so that all teachers of mathematics at the various levels could visit the central office and use the materials on file.

Periodically, materials files should be reorganized by a committee and "weed out" materials that are of little value or out-dated.

Item 6. Cooperative Planning. (41.9%) During the school year many problems arise that can only be solved through cooperative planning. Committees should be formed within the mathematics department or mathematics teachers working with other departments to help solve problems and make recommendations so that the administration or school board can act. Generally, cooperative planning is within a

single school or a single school district where as cooperative study (Item 7) includes other groups such as the college level.

Item 7. Cooperative Study. (21.0%) Cooperative study included agencies outside the regular school district such as a nearby college. A committee may be formed of both classroom teachers and college faculty members to study a problem common to both.

Industry may require areas of mathematics not generally covered by present curriculums. A cooperative study including both the classroom teacher and representatives of industry would be an ideal approach to any solution. Only by such studies will the problem of each be better understood so that solutions may be attempted.

Item 8. Parent Education Courses. (27.8%) When "New Math" was introduced to the junior high and elementary schools parents were"shocked" to find they could no longer help their own children with the homework. Many school boards were swamped by parents to offer special courses so that parents could also learn new math. Many school districts added new math for parents to the evening adult education program. Others offered adult math courses covering new math to interested parents at PTA meetings or during "back-to-school night" programs.

Item 9. In-Service Courses at Local Colleges. (33.6%)

Many local colleges, both private and public, offer in-service courses in mathematics. Many such programs are taught by past participants of the SJSC-AYI.

Basically, in-service programs can be divided into two groups, credit and non-credit. Credit courses are sometimes sponsored by NSF allowing qualified teachers to attend with tuition, books and gasoline-mileage being paid by NSF funds. Non-credit in-service courses could be offered within a school district or at the inter-school district level.

"The institute program of the NSF has had great influence on improving the academic background of science teachers."[6]

Item 10. Teacher Discussion Meetings. (55.6%) Teacher discussion meetings may be conducted within the single school or within the district. Such meetings could be held on a seminar basis or "buzz session". The point in question would be to meet and discuss issues in mathematics.

There seems to be little doubt that classroom teachers have a great influence upon their students behavior and future ambitions.[7]

Item 11. New Teacher Conference. (46.5%) A

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[6]Charles L. Koelsche, "Characteristics of Persons Submitting Applications in 1962 for Participation in NSF Institute Programs at the University of Georgia," Science Education, XLVIII, No. 1 (February 1964), p. 35.

[7]Ibid., p. 31.

beginning teacher or teachers new to the district require additional help to become familiar with teaching in the new or beginning situation.

New teacher conferences should include areas of mathematics or be programmed so that all the new teachers of mathematics are fully briefed to their new school.

Such briefing would include items as visual aids, location of math files, professional books, dates and locations of math meetings or conferences.

Item 12. School Professional Library. (37.2%) Every school district should provide a professional library for the district faculty, administration, and board members. Ideally, the professional library would be housed at a site most convenient to all concerned; many central offices are located in town where parking and traffic may discourage teachers from using the library services. In some districts it may be better to locate the professional library in an elementary school in the less traveled part of town.

The library should include books on mathematics and the teaching of mathematics, and care should be taken to see that a fair amount of the monies budgeted the professional library are spent on mathematics.

In some cases, money should not be spent on the purchase of math textbooks as book publishers are happy to send desk copies or complimentary copies of math textbooks. Many private and governmental agencies will also supply

school districts with free or inexpensive math books if requested.

Item 13. Participation on Curriculum Study Committees. (67.5%) Our world is in a state of constant change and the curriculum must also change to keep pace.

Curriculum study committees should be made as permanent committees in every school district, with one or more chairs of the committee being held by teachers of mathematics.

In order to make such a program successful in the elementary school it is essential that teachers understand what they want children to observe.[8]

Item 14. Textbook Study. (58.7%) Most state departments of education supply the textbooks to the public schools. The state text series is generally replaced in each topic field about every five to seven years. This would allow mathematics texts to be changed on a five-to-seven year basis.

Textbook committees should meet periodically to review newly published math texts. Such a committee should have a method of evaluating math texts as to content and grade level. After books have been rated, recommendations

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[8] Sister Maria Clare Markham, "A National Science Foundation In-Service Institute for Teachers of Primary Grades," School Science and Mathematics, LXII, No. 6 (June 1962), p. 403.

should go to local school boards and to the state department of education requesting the math texts that are felt to best serve the school district.

Some school districts budget money for supplimentary or reference math texts. Again, recommendations from the textbook committee would help in the selection of such books.

As pointed out in Item 12, many book publishers are happy to supply desk or complimentary copies of math textbooks upon request.

Item 15. Research Group. (16.3%) There is an infinite number of levels on which mathematical research can be conducted. One example would be, "How Junior High Math Can Be Taught to Slow Achievers".

A possible way to make research group participation more appealing would be for the school board to allow release classroom time or salary incurement increase for participation.

Item 16. Materials Workshop. (23.2%) The field of instructional materials and technology has greatly increased. Today, the mathematics teacher has an unlimited number of teaching devices available to suppliment the math program.

16mm films, 35mm filmstrips, overhead projectors, magnetic chalk boards, models, charts, both closed circuit and educational TV, to name but a few. Every sincere math teacher should be familiar with the educational materials

and with their limitations. Former AYI participants should hold short in-service programs to acquaint math teachers with these educationa media materials.

Many private and governmental agencies are willing to supply mathematical materials to school districts at little or no cost.

> There once was a math teacher who
> Thought visual aids were tabu,
> Till a teacher one day
> Put on quite a display
> Now she can't teach without them. Can you?[9]

Item 17. Experimental Program. (55.6%) Experimental mathematics programs should be encouraged in any school district. Ideally, a new program should be conducted along side a control group so that results can be measured to determine which program is really better. Only after careful evaluation, and then if the experimental program proves of value, should it be introduced to the regular school curriculum. Research and curriculum groups (Items 13 and 15) should also make recommendations both favorable and unfavorable regarding all experimental programs.

Item 18. Informal Seminar Groups. (25.3%) Every teacher of mathematics needs "regenerating" from time to time. An ideal place to learn and exchange mathematica ideas would be in an informal seminar group. Guest speakers,

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[9] Edward H. Whitman, "Self-Service In-Service," Mathematics Teacher, LVI, No. 6 (October 1968), p. 693.

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desirable for mathematics teachers to agree upon some form of test construction. Each teacher would still make up his class test but would use the agreed upon form to prepare such tests. Test construction would also include procedures for scoring and placing grade values to math tests. Test standardization would allow students to be rated on a school-wide or district-wide basis rather than on the self-contained, classroom basis.

Item 22. Film Festival. (11.6%) At the county or inter-school district level, a "Film Festival" would be offered. A central viewing room that would comfortably seat all those that could attend would be desirable.

Several months prior to the film festival, contacts would be made with distributors of mathematical films, both private and governmental. Films would be booked for showing on the film festival date. Advanced notice will be given to all mathematics teachers and supervisors or the various districts involved, telling the date, time, and place.

Evaluation forms should be made available so as to rate the films and place them at grade levels. Films that receive high ratings should be budgeted for purchase or booked on rental basis for the appropriate time during the coming school year. In the case of a rental film, if it could be shared with several schools during a given booking period, cost would be reduced.

Films already owned by the district should be re-

viewed as they may no longer be satisfactory because of damage, or they may be too out-dated to fit the present curriculum. Out-dated or damaged films are accepted by some film distributors as down payment toward new films.

PTA and local service groups have purchased educational films for local schools when no monies were available within the school budget.

Item 23. Field Trips. (6.9%) Field trips to enrich or future teacher concepts of mathematics should be encouraged both on classroom released time or on individual teacher time.

Trips to such places as banking facilities, scientific or engineering plants not only benefit the classroom teacher, but involve the community and help them better understand the problems of the classroom teacher.

Some school districts sponsor Business-Education Day. On such a day students are excused from school to allow the classroom teacher to visit with business and industrial firms in the community. Generally, the following year businesses and industries are invited to spend the day within the classroom of any of the public schools, spending the entire day with the students and teachers.

Item 24. Local Conference. (25.3%) Mathematics conferences are conducted by many national, state, and local mathematics organizations. The National Council of Teachers of Mathematics has held conventions in various parts of the

nation since 1920. Presently, the NCTM has a membership of 52,000.[10]

Local conferences would allow mathematics teachers from nearby school districts to meet and exchange ideas or listen to outstanding speakers.

Item 25. "Briefing" of Teachers for Student Problem Contests. Mathematics contests have become increasingly popular to students of mathematics. One school district was forced to call off an athletic track meet scheduled on a Saturday, because more students preferred to attend a "mathematics contest" than the track meet. Many students enjoy the spirit of competition and find mathematics to be fun and exciting. In some cases students that may be physically handicapped and cannot participate in sports, outscore the most able athletes in a math contest.

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[10] Figure taken from Golden Jubilee, NCTM, 1969 (Washington: National Council of Teachers of Mathematics, 1969), p. 8.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

San Jose State College first offered the Academic Year Mathematics Institute for Junior High School Teachers, sponsored by the National Science Foundation, in 1962. Since then 216 participants have completed the nine Institute programs, and future programs are planned by San Jose State College for future years.

Interest in the program has been shown each year by junior high school mathematics teachers by some 300 applications competing for the twenty-four NSF participant vacancies.

Conclusions

From the previous study the following conlusions can be drawn:

(1) Junior high school mathematics teachers are aware that additional mathematical education is essential in today's world. Many of these same teachers are applying for participant positions in the Academic Year Institutes, Summer Institutes, and In-Service Institutes sponsored by NSF.

(2) San Jose State College AYI program is unique

in the nation as it not only up-dates the participant's knowledge of mathematics but also qualifies the participant as a resource teacher of mathematics at the elementary and junior high level.

(3) SJSC AYI curriculum varies from year to year to meet the needs of the participants and the school districts they represent.

(4) Studies conducted throughout the United States indicate that NSF-funded institutes are meeting the national objectives of strengthening education in science and mathematics by improving the subject-matter competence of the participant-teachers.

(5) That NSF and SJSC plan to continue the Academic Year Mathematics Institutes in future years.

Recommendations

In order that competencies of the junior high school teacher be improved in the future, the writer feels that the following recommendations are in order:

(1) That school boards of education be encouraged to allow teachers to attend AYI by offering sabbatical leave. In the case a teacher cannot qualify for sabbatical leave, then the difference between the teacher's regular salary and the cost to hire a replacement teacher should be paid.

(2) That SJSC School of Education allow more than the present ten graduate level units of mathematics count

toward the Master of Arts Degree in Education.

(3) AYI participants be given SJSC status above the graduate level so that college facilities such as the library and educational media services could be better utilized.

(4) Because of a poor response on the past participant follow-up questionnaires sent, the AYI director should use a different method to gain better response.

(5) To prevent ambiguity on the twenty-five participant activities, that a brief description of each item or sample answer sheet be included with the follow-up packet.

(6) "One day" or other date deadline requirements be waived by SJSC Graduate School for AYI participants.

(7) Enrichment lecture series be published annually and sold at cost to defray publishing expenses.

(8) Future AYI give greater emphasis to items 8, Parent Education Courses; 10, Teacher Discussion Meetings; 14, Textbook Study; and 17, Experimental Program. These four items rated highest on past participants' follow-up questionnaires.

(9) NSF stipends and dependency allowances be increased so that married and single participants could afford to attend AYI.

(10) Each year the AYI appoint a historian to record the academic and social happenings, such as guest speakers, field trips, picnics, and other activities.

A copy of the historian's report would be given to each participant and one copy to each of the members of next AYI so as to give them some idea of the spirit and fellowship of former AYI classes.

(11) A reasonable amount of AYI secretarial time be allowed for typing of participant-required papers such as term reports and research papers.

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C. PAMPHLETS

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In-Service Mathematics Institute, 1969. San Jose: San Jose State College, 1969. 6 pp.

Research in Education, undated. Washington, D.C.: U.S. Department of Health, Education, and Welfare, Office of Education. 2 pp.

APPENDIX

1962-63 AYI

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NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

December 19, 1969

Mr. Joseph G. Merkel
131 Liberty Street
Santa Cruz, California 94060

Dear Mr. Merkel:

Your letter dated 11 December 1969 requesting information on appraisals of NSF Academic Year Institutes in Mathematics has been referred to me.

Numerous independent studies related to evaluation of Institutes have been conducted. Enclosed is a bibliography of the reports of which we have received copies. I have marked the ones for Academic Year Institutes with red ink. If you have difficulties in obtaining a copy of any of the manuscripts in which you are interested, write us directly and we will try to help you.

I believe you might be able to obtain a more detailed bibliography from the Educational Resources Information Center, located at The Ohio State University. The complete address is:

ERIC Information Analysis Center
for Science Education
1460 West Lane Avenue
Columbus, Ohio 43221

I hope this information will be useful to you. If we can be of further assistance, please do not hesitate to ask us.

The Foundation is always interested in the results of independent research on science (including mathematics) education programs and would appreciate receiving a copy of your report.

Sincerely yours,

Phyllis L. Johnson

(Mrs.) Phyllis L. Johnson
Staff Assistance

Enclosure

Name _____ AYI Year 39

Academic Year Institute
Mathematics Department
San Jose State College
San Jose, Calif. 95114

Checklist:

The following is a list of possible in-service activities which you may have directed. Check those in which you have engaged and add to the list any which we may have omitted. Indicate by (E) any that you expect to initiate in the near future, and by (N) any which you considered but found a negative response.

_____ Intensive Workshops

_____ Interdistrict Cooperation

_____ Enrichment Lectures

_____ Articulation Committee

_____ Materials File

_____ Cooperative Planning

_____ Cooperative Study

_____ Parent Education Courses

_____ In-Service Courses at Local Colleges

_____ Teacher Discussion Meetings

_____ New Teacher Conferences

_____ School Professional Library

_____ Participation on Curriculum Study Committees

_____ Textbook Study

_____ Research Group

_____ Material Workshop

_____ Experimental Program

_____ Informal Seminar Groups

_____ Television Teaching

_____ Micro Teaching

_____ Test Construction (school wide)

_____ Film Festival - films for teachers and/or students

_____ Field Trips for Teachers

_____ Local Conference

_____ "Briefing" of teachers for student problem contests

Other: List below

Attach details and comments on a separate page if you wish.

INDEPENDENT STUDIES RELATED TO EVALUATION OF INSTITUTES

BAUERMEISTER, HARLAN E.
"An Examination of Selected 1959 National Science Foundation Summer Institutes in Minnesota", The Minnesota Journal of Science, Vol. III, No. 2, 1-13, December 1959.

BEGLE, E. G.
"NSF Summer Institutes - Evaluation" Manuscript, April 1959.

BIESTER, JOHN L.
"Report on Post-Institute Participant Evaluation", Manuscript, April 18, 1962.

BREKKE, G. W.
"A Follow-up Study of the Effectiveness of NSF Science and Mathematics Institutes for Secondary Teachers in Meeting Stated Goals", Dissertation Manuscript, January 1964 (Gustavus Adolphus College).

BUNNELL, ROBERT A.
"Differential Participation in National Science Foundation Institutes", Dissertation Manuscript, 1965 (University of Chicago).

CAMPBELL, C. D.
"An Advanced Physical Geology Course for High School Teachers", Journal of Geological Education, Vol. 8, No.1, 1-5, Spring 1960.

COLE, JAMES W.
"Teaching Teachers of the Sciences and Mathematics", University of Virginia Newsletter Vol. IIIVI, No. 7, 26-28, March 15, 1960.

DALY, JOSEPH LaVERNE
"An Evaluation of the Second Academic Year Institute University of Utah, 1958-59", Dissertation Manuscript, August 1959.

DEWEY, DANIEL G.
"Survey Summary (of Participants of NSF In-Service or Summer Institutes in Mathematics, 1958-1967, College of the Holy Cross)", Manuscript, December 1, 1967.

FIELDS, EWAUGH F.
"A Study of Changes in the College Preparatory Mathematics Curriculum and Institute Attendance of Mathematics Teachers in Public Secondary Schools of New Jersey during 1964-1967", An Abstract of a Dissertation Manuscript, April 1969.

FRASER, THOMAS P.
"A Reasonable Approach to a Master's Degree Program for Secondary School Science Teachers", School Science and Mathematics, 68, 793-798 (1968).

GALLENTINE, JERRYL. and BUELL, ROBERT R.
"A Study of Science Preparation of Ohio Elementary School Teachers Applying for NSF Institutes", School Science and Mathematics, 66, 573-574 (1966).

source personnel for elementary teach-
s, it is necessary that the applicant have
e opportunity to fill this role. He will be
ked to supply information concerning
e potential demand for such services. At
st one elementary school district in his
ea should indicate tentative plans for an
-service training program which would
ilize his services following the Institute.

pplications for participation by super-
sors will be evaluated separately. For
ese persons, in addition to the criteria
ove, there must be a commitment that
pproximately half of their work will be
the field of mathematics education.

he National Science Foundation imposes
e following restrictions on eligibility in
national brochure: "Teachers who will
ve completed by September 1969 a sub-
antial portion (two or more summers) of
sequential program in Summer Institutes,
ding to an advanced degree, are not
igible to receive stipends in a 1969-70
cademic Year Institute except in unusual
rcumstances. Teachers who by Septem-
r 1969 have received stipends to attend
ree unitary Summer Institutes during
e previous five years, are not eligible to
ceive stipends to attend a 1969-70 Aca-
mic Year Institute except in unusual
rcumstances."

using and Meals

ing and meals are available at reason-
st. Nearby private rooming houses charge
$350 for a semester's room and board or
$150 per semester for room only. The
g Office, with a professional staff, main-
file of rooms and apartments for rent;
e monthly rental for small furnished
ents is about $120. Three full meals may
rchased at the college cafeteria for less
3.00. In general, living costs for students
oderate, and extra cultural and social
es are abundant at the college and in
ea.

ticipant Support

participant in the Academic Year Insti-
ill receive specified stipends and allow-
The ng amounts indicate the *max-*
all

1. A basic stipend of $3000 for the academic year.
2. An allowance of $450 per dependent for the academic year, where the term "dependent" is defined according to the rules of the Collector of Internal Revenue.

   Dependency allowances may not exceed support for more than four (4) dependents.
3. A book allowance valued at $75.
4. A travel allowance based on twice the round trip mileage from the participant's home, at four cents per mile; not to exceed $160.
5. Stipend holders will not be charged tuition or any other college fees connected with the Institute.

*Because of a somewhat limited budget the basic stipend may be reduced for those who receive substantial support from other sources. All participants will receive full allowance for dependents. The amount of any given stipend will be made explicit with the invitation to participate in the Institute.

The participant's school district is encouraged to grant a supplementary award, such as a sabbatical leave. This would be of mutual advantage in that the teacher would be under contractual obligation to return to his former district and would utilize his new training there. However, selection will be made without regard to availabilty of supplementary support.

Applications

Application forms may be obtained from: Dr. Max Kramer, Director, Academic Year Institute, Mathematics Department, San Jose State College, San Jose, California 95114. Please use a POSTCARD for this request.

The completed forms should be returned to the director postmarked ON or BEFORE *February 1, 1969*. Application forms should be requested early; certainly not later than *January 20, 1969*, in order to insure adequate time for completion and return.

Successful applicants will be notified on February 15, 1969 and must indicate acceptance by March 1, 1969. Subsequent to this date no change of commitment shall be authorized unless circumstances make it impossible for the participant to attend *any* institute.

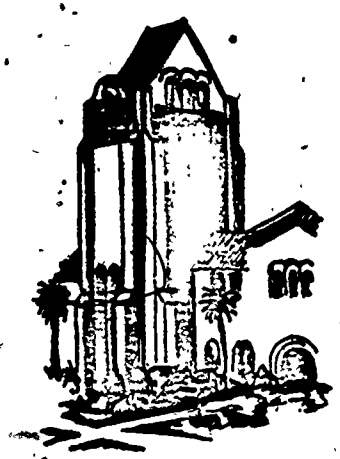
academic year mathematics institute

FOR JUNIOR HIGH SCHOOL TEACHERS AND SUPERVISORS

at

San Jose State College

SAN JOSE, CALIFORNIA



Sept. '69 to June '70

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