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ABSTRACT

For four years the California State University and Colleges attempted to encourage new approaches to instruction that would provide students with increased options in their educational programs and opportunities for faculty to test and develop their ideas for improving the quality of instruction. A number of different learning and teaching methods, tested in over 100 major pilot projects are evaluated. Assessments of campus, faculty, and student reactions to innovation and change in instruction are noted. Details are provided about the functioning and administration of each program along with a listing of all projects by kind of innovation and discipline area, including brief descriptions and statements of current status. Project evidence suggests that each instructional strategy tested has some educational value depending on discipline, student characteristics, faculty experience, and campus environment. (Author/KE)

THE CHALLENGE OF CREATIVE CHANGE

THE PROGRAM FOR INNOVATION AND IMPROVEMENT IN THE INSTRUCTIONAL PROCESS

THE CALIFORNIA STATE UNIVERSITY AND COLLEGES

New Program Development
and Evaluation
Office of the Chancellor
March 1975

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FOREWORD

This is the latest in a series of reports describing the Program for Innovation and Improvement in the Instructional Process which began within The California State University and Colleges system in 1971. The Program is a coordinated effort designed to foster experimentation with the objective of improving the instructional process within the largest four-year college and university system in the nation. We are convinced that the Program, with a very modest dollar investment, has had widespread impact on students and faculty in many ways. We must now assure that this impetus for constructive change is maintained and that permanent mechanisms for encouraging experimentation become a part of continuing campus and system programs.

The Program has received national recognition. This has been made possible only with the encouragement of the Legislature, the Executive and the Trustees and through the efforts of many hard-working project directors and their students. I am particularly pleased that the large majority of pilot projects which have completed an initial trial period have become a part of regular campus programs. This is a mark of the value of tested ideas and concepts, as well as an indication of the willingness of campuses readily to accept sound educational reforms. Faculty development programs, learning assistance centers and an inter-campus faculty exchange program are among some of the ideas which have been tested and are now gradually being made a part of system and campus programs.

Much of the literature of higher education indicates that innovators tend to innovate alone. When they leave an institution or direct their interests elsewhere, everything returns to the status quo ante. I am struck by the figure cited in this report which indicates that 75% of the projects have resulted in identifiable and positive effects among other faculty. Furthermore, the roster of faculty who have embarked on major improvements in their courses and programs, apart from any special support or recognition, is constantly growing – attesting to the favorable climate for planned change which we seek to enhance within this system. This coordinated Program, designed to encourage the testing and extension of sound and cost-effective innovation, is contributing to a rewriting of the conventional wisdom of higher education.

It is not possible to recognize all of the persons who have contributed to the Program to date. We would, however, like to thank particularly several individuals who have contributed in a major fashion to this report through their comments and by providing data and perspective: Russell Travis and Thomas Watts,Bakersfield; De Vere Pentony and Robert Picker, San Francisco; Jerrold Kemp and Ron McBeath, San Jose, and Rhody Ringis, Dominguez Hills. John M. Smart prepared the report assisted by Toni Howard of the staff of the Division of New Program Development and Evaluation of my office.

Glenn S. Dumke
Chancellor

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GLOSSARY

Following is a list of terms which may not be familiar to the reader or which have specific meanings within the context of this document:

Advanced placement – *Programs for high school graduates in which they are placed at advanced levels on entrance to college. There are also the Advanced Placement Examinations of the College Entrance Examination Board. High school seniors passing these examinations receive college credit in appropriate subject areas.*

CLEP – College Level Examination Program of the College Entrance Examination Board and Educational Testing Service. *Examinations offered are used for credit-granting purposes by some institutions, normally for freshman and sophomore work. The CLEP program includes five General Examinations which are not equivalent, as a rule, to specific courses. Some thirty Subject Examinations are also available.*

Cost-benefit analysis – *A means for comparing resources (cost) of a specific project with the results (dollar benefit) likely to be obtained.*

Cost-effectiveness analysis – *Measurement of the extent to which resources allocated to a specific objective under each of several alternatives actually contribute to accomplishing that objective, so that different ways of attaining the objective can be compared.*

Evaluation – *The purpose of evaluation is to compare actual accomplishments with desired outcomes in order to improve performance. Important questions to be answered are (a) Which objectives were achieved? (b) Which objectives were not achieved? (c) What factors contributed to the accomplishment of specific objectives and the failure to accomplish other objectives? (d) What should be done to improve future performance?*

Faculty development – *Programs to increase faculty skills in teaching, student evaluation, use of media in instruction and communications abilities. In this report, the term does not apply to programs intended to increase faculty academic knowledge such as assistance to faculty to complete the Ph.D. or retraining programs.*

Independent study – *Used in this report to refer to programs which permit a student to pursue the great majority of coursework on an independent basis, usually as a part of a group guided by several faculty.*

Instructional development – *The systematic planning and evaluation of instruction based upon explicit measurable objectives. The process includes pretesting students with respect to skills enumerated in the objectives, selecting specific learning activities related to objectives, and evaluating the effectiveness of the instructional sequence based on students' attainment of the prespecified objectives.*

Innovation – *As used in this report, innovation applies to substantive changes and reforms in instructional method, uses of student and faculty time and the process of learning. An instructional approach new to a campus or discipline can be innovative even if tried elsewhere or in another discipline.*

Instructional television (ITV) – *Campus-based television programs and services usually operated on a closed-circuit basis. Educational television (ETV) normally is applied to open-circuit and cable programming offered by publicly supported stations.*

Learning assistance center – *A center at which students may receive special help in overcoming learning problems and improving basic skills. Tutors, counselors and mediated self-learning materials are typically available in such centers.*

Learning resources service or center *A term in increasing use which is applied to audio-visual, television, instructional design and evaluation services combined or coordinated on a campuswide basis.*

Modularized course *A course divided into units. Usually each module is created around specified learning (behavioral) objectives. Students are tested on completion of a module, and must pass in order to move on to the next. Some modules may require effort equivalent to one student credit unit (SCU) per module. Others may be the equivalent of a lesson completed in a few hours of work.*

Organizational development *A process by which an organization examines its processes, procedures and the components of its environment for continuous change and revitalization.*

Personalized System of Instruction (PSI or Keller Plan) – *Approximately equivalent to modularized instruction, PSI is a method first developed by Fred Keller in which courses are divided into units, students cover each unit with tutorial assistance, and after demonstrating "mastery" of the unit, move on to the next.*

Self-pacing – *Students moving at their own pace through a curriculum. Often tied to modularized courses, continuous testing, etc. Self-reliant study and individualized study are alternative terms.*

SOCRATES – *A copyrighted acronym used for the computerized test item data bank system and computer program in use within The California State University and Colleges.*

Time-shortened degree – *A degree program in which a student may complete his work in less time than would otherwise be the case. This may be achieved through credit by examination, redefinition of curricula, early entrance into college from high school, or program acceleration through self-paced learning.*

A PREVIEW . . .

This report reviews the highlights of nearly four years of effort within The California State University and Colleges to encourage new approaches to instruction which will provide students with increased options in their educational programs and opportunities for faculty to test and develop their ideas for improving the quality of instruction. The report presents findings and conclusions on a number of different learning and teaching methods, tested in over 100 major pilot projects. Assessments of campus, faculty and student reactions to innovation and change in instruction are noted as well. Appendices provide details about the functioning and administration of the program and a listing of all projects by kind of innovation and discipline area, together with brief descriptions and statements of current status.

The pages which follow constitute at one and the same time, a summary of what has been accomplished, a handbook for those seeking detailed information, and a basis upon which new directions are being planned to stimulate creative change. The intended audiences are multiple: the legislature, the executive branch of state government, the CSUC system, including trustees, faculty and administrators, and other interested individuals throughout the country who are themselves developing programs to assure that higher education remains vital and dynamic.

A special state fund has enabled faculty to test a number of different learning strategies which, if educationally and fiscally effective, can be implemented on a permanent basis to provide additional student options. For example, projects have experimented with offering intensive semester-long programs to which a student devotes all or nearly all of his or her time and effort. Findings indicate that such programs are sound educationally. Some students have difficulty in the self-discipline required, though most prefer the opportunity to concentrate upon subject matter in the intensive manner possible in such curricular designs in contrast to the traditional courses taken at once in several subjects.

A variety of approaches to self-paced learning have been tested with particular emphasis placed upon courses divided into units or modules. Project results show student motivation is the major concern within any program which permits self-paced learning. The student works on each unit at his or her own pace, proceeding to the next only when competency has been demonstrated. Some students have difficulty in completing coursework on this basis and fall behind, while others benefit both from the opportunity of moving as quickly as they can

and from the more precise definition of skills and knowledge provided by continuous testing, usually a major part of the self-paced/modularized instruction approach. Maturity and independence are characteristics which seem to be shared by those who do well. For the most part, students desire some kinds of group contact in all projects though not necessarily in the traditional classroom setting.

Several projects explored ways in which students may challenge courses or subject matter areas if they believe themselves prepared either through self-study or previous experience. A phased program for developing system policies on externally developed and administered challenge examinations has resulted from these experiments. In addition, the system is sponsoring a statewide evaluation program in freshman English and is exploring the need for similar efforts in other general education areas. A project which has developed a system for certifying past experience for general education credit has proved a sound educational option. Department developed challenge examination programs have not proved to be as successful as hoped. Limited student interest, combined with the amount of faculty time required to operate orderly programs, raises questions about extensive offering of this option to students under current funding patterns and demands on faculty time.

Specification of competencies expected of graduates in their degree major has been the focus of several projects. These efforts have highlighted the need for faculty to come to grips with what is expected of graduates in their discipline. This is a most difficult task for many subject areas, particularly in the social sciences and the humanities. Promising approaches are in the development stage involving deliberate identification of concepts in each of several disciplines.

Increasingly, faculty are becoming aware of the growing instructional potential of technology. Most of the experimental projects have made use of one or more of the media beyond the spoken and printed word. Results show that students can be provided effective learning opportunities through media used in various combinations. No single medium is superior to another in all situations. The particular learning problem, student readiness, costs and facilities, all enter into the decision to use one medium or combination rather than another for instruction. Television has been found useful in capturing experiences which students would normally only encounter in field visits or through clinical observation. A pioneering effort has been launched in developing computerized test item data banks to aid instructors in several disciplines. Facilitated by an extensive computer network, professors from throughout the system can use the program, called SOCRATES, to provide them with tests constructed to their specification and detailed analyses of their students' performances in comparison with others.

The premises behind the Carnegie Commission's report, *Less Time More Options*, have been tested in different ways through several projects, including a specially designed baccalaureate program which may be completed in three years. While evidence is limited, it appears there is a small minority of students within the CSUC system who are interested in time-shortened degree programs. A complication we have found is that even those students who have "tested out" of a year of work

may use the year's headstart to stretch out college work or to enroll in other courses they would not otherwise have taken.

Campus participation and interest in innovation and experimentation has varied across the system. Administrative support has been an important variable. Campuses on which there was little interest two or three years ago now reflect marked enthusiasm. Expanding recognition of the need for faculty development, including training in use of technology and improving relations with students and colleagues, reflects the impact of project activity.

Faculty attitudes toward trying new approaches to instruction have been generally positive. The number of faculty seeking to make substantial changes from traditional approaches is still a minority, though an active and enlarging one. On some campuses, promotion and tenure policies do not appear to take into full account the effort required to innovate. In other instances, however, innovation has been a major factor in promotional decisions.

Student response to most projects and experimental efforts has been positive. Systematic efforts are made to obtain evaluations of project approaches from participating students. In many cases assessments are solicited during the course of the project as well as at the conclusion so that adjustments may be made which will enhance effectiveness. Though students often initially find new approaches more attractive in the abstract than in the experience, most conclude the programs favorably disposed to them and ask for more.

Within the Office of the Chancellor, staff have coordinated projects, encouraged inter-campus exchange and project development, disseminated project results and provided advice to faculty on the best methods of developing their ideas. In the next few months approximately a dozen faculty workshops will be held to present results of as many different projects. As final reports on projects become available, they are published for the benefit of others in the system. Six such reports are currently available or in press with others planned for publication this year.

The agenda for the Program for Innovation is a changing one. Three years of open competition for experimental pilot projects have provided the basis for new directions. In the coming year, primary emphasis will be placed upon inter-campus projects designed to involve substantial numbers of faculty in the process of innovation. A "mini-grant" program was begun in 1974-75 and will be continued in 1975-76. Block grants, varying in size according to institutional enrollments, are made to each campus, with project solicitation, screening and selection undertaken by the institution within the general Program guidelines. The purpose of the mini-grant program is to enhance campus research and development capacities and to provide faculty with modest funding to take full advantage of the results and products of previous experimental projects.

A primary task of those within the Program is to develop permanent methods through which support, stimulus and administrative recognition can be provided for faculty as they explore new ways in which quality education may most effectively be provided to an increasingly diverse student population.

INTRODUCTION

Innovation is, of course, in the eye of the beholder. What is new to one institution, one department, one faculty member, or one system, may be traditional to another. There is little, if anything, which is truly *new* in higher education. Innovation is, however, the best term we have to describe a *process* in which faculty, students and administrators work together to increase opportunities and options for students and by which the nineteen campuses in our system can be responsive to the realities of the 'seventies and the prospects of the 'eighties.

In the following pages we seek to describe what has been termed formally the Program for Innovation and Improvement in the Instructional Process within The California State University and Colleges sytem. In our everyday conversation it is called the "innovative program". It is an outgrowth of the New Approach to Higher Education first proposed by Chancellor Glenn S. Dumke over four years ago when a commitment was made to provide increased educational opportunities for students in our institutions and to enable faculty to undertake experiments designed to increase their instructional effectiveness.

We have set ourselves the task of testing a variety of alternative approaches to teaching and learning in the belief that such efforts, carefully evaluated, will lead to an enhanced capability to offer educationally sound new or less usual options to the traditional options suited to our students' interests, needs and capabilities. An underlying assumption of our efforts is that all students do not learn best in the same way. In a period of increasing student diversity, changing roles for our colleges and universities, and rapidly expanding knowledge of teaching and learning alternatives, we believe that it is essential that we act responsibly and imaginatively to meet these new challenges.

The Program for Innovation, then, is really a process, and one which we believe has worked to bring about change – not simply change for the sake of change, but change which carries a potential for constructive reform of the educational process.

In more than 100 major pilot projects, and, for the first time this year, in an additional 145 smaller efforts, faculty and students have sought better, alternative ways of teaching and learning. A conservative estimate is that in the first two years of the Program almost 2,000 individual faculty were identified with program activities and perhaps some 33,000 individual students.* Projects funded in 1974-75, together with the mini-grant programs, serve to extend considerably both student and faculty involvement in the innovation process. The many hard-working project directors, their students and associates, are large in number, even within a system the size of the CSUC.

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*A survey of projects funded in 1972-73 and 1973-74 through the Program conducted with the cooperation of campus coordinators indicated that some 2,200 faculty members in 1972-73 were project directors, project associates or participated in some activity such as a workshop sponsored through the Program. In 1973-74 the estimated number reached 1,200; a greater number is expected this year.

Similar data show that approximately 17,000 students in 1972-73, and an additional 19,000 for 1973-74, have engaged in some aspect of innovative projects, in most cases as students in courses which were the result of a project or as users of instructional materials developed under project sponsorship. (See Appendix D for listings by project.)

To capture in a single document the full scope of the objectives, process, implementation and evaluation of so wide a spectrum of project and program activities is not possible. What *is* attempted is an overview of projects as they have tested different instructional strategies and options, and from this overview, a summary of the implications these activities have for The California State University and Colleges system.

Ours is a coordinated program designed to ensure a maximum of results by avoiding duplication of efforts through a centralized process of screening proposals for pilot projects. We have sought to extract the fullest possible meaning from projects individually and collectively for the benefit of a system of nineteen campuses. It is this feature which is truly unique and which sets the Program apart from institutionally based and focused efforts toward innovation and change.

The Program's objectives, organization, funding and Program implementation are discussed in Appendix A. Several major points, however, should be set forth at the outset.

The Program has been funded primarily through special state funds and campus matching monies, with the substantial additions of an initial major grant from the Carnegie Corporation and, more recently, a grant for faculty development from the federal Fund for Improvement of Postsecondary Education. Administration and coordination have been the responsibility of the Division for New Program Development and Evaluation within the Office of the Chancellor for the system. The Program has featured open competition of proposals generated by faculty. Funded projects, insofar as possible, have been designed so that, if successful, they may be embedded within the regular educational process.

A survey completed in December 1974 found that of 55 *different* projects funded in 1972-73 and in 1973-74, 48 are continuing in 1974-75 with normal campus resources. In addition, other projects not directly linked to program offerings met their objectives. Only seven instructionally focused projects have not been continued, while two other projects did not fully meet their objectives. Even in the case of "unsuccessful projects," interviews with project directors and other campus representatives have disclosed some continuing benefits, if not of the sort originally expected.

The kinds of projects and activities supported by the Program can be classified into the following categories of emphasis, with many projects sharing more than one emphasis:

1. Independent study
2. Credit by examination
3. Comprehensive/core examinations
4. Self-paced instruction
5. Time-shortened degree programs
6. Testing new modes of instruction
7. Mediated instruction
8. Faculty and professional development
9. Reduction of student attrition
10. New uses of time and facilities
11. Improvement of efficiency in the educational process

The evaluation of projects has been a multiple responsibility of project directors, the host campus, faculty observers, student participants, the system office and, in some instances, third party or outside evaluation experts. The findings presented in the following pages have been based on a combination of these sources.

Specific learning and teaching strategies are discussed first, along with findings from individual projects. In later sections, campus, faculty and student responses to change and innovation as such are presented, followed by a summary discussion of the ways in which project and program results have been disseminated within the system. Finally, our conclusions are set forth about the Program as a whole, the kinds of innovations and efforts most conducive to change, and the implications that these conclusions have for the system. In the process of presenting a summary of findings, not every project can be covered. Brief project descriptions are provided in Appendix F together with the project's current status and major findings to date.

There can be no *final* evaluation of an on-going, dynamic process such as this Program, for such a reckoning would signify the end of seeking ways in which to meet the challenge of creative change.

I. WHAT HAVE WE LEARNED ABOUT LEARNING STRATEGIES?

The Program has attempted through demonstration projects to test different strategies of innovation and change, particularly those directed to the establishment of optimum levels for the time spent by the student in conventional classrooms, the extent to which he should be encouraged to move at his own pace, and the definition of new roles for faculty as advisor and academic counselor. These experiments have proceeded with close attention being paid to their costs and benefits.

Project results indicate that some instructional strategies serve to meet these long-term goals better than others. In certain instances contradictory results have been obtained, suggesting that further close examination of certain kinds of approaches is called for. Thus, differing applications of essentially the same basic idea for example, the modularization of a course to increase opportunities for independent and self-paced learning – can result in varying conclusions on the usefulness of the concept. Many factors are responsible for this divergence, including faculty experience, student motivation, campus environment, the specific discipline, the existence of competing "conventional" courses in that discipline, and availability of appropriate configurations of physical space. Furthermore, project directors have had plans go awry when computers programmed to adjust course registration to the capacity of the assigned classroom in order to meet state mandated space utilization standards arbitrarily placed limitations on the class size of independent learning courses requiring no limits. A new custodian efficiently disposed of all of the questionnaires completed by students entering an experimental program. Project delays on occasion are due to state equipment procurement processes, sometimes resulting in major project adjustment and multi-year funding when only one year had been first projected.

Project findings range from extensive data derived from many observations to "hints for the handy innovator." For example, Bakersfield's experimentation revealed that 58% of 26 faculty who offered modularized courses, believed that more work was demanded of students in their experimental courses than in corresponding conventional courses, 23% saw little difference, and 19% viewed them as less demanding. Efforts by one project director at San Diego to advertise his project in credit by examination in literature led him to conclude that the campus newspaper was the most effective means for interesting students, followed by posters which he placed about campus, while presentations to incoming groups of majors and flyers at registration tables resulted in little or no response. At still another level, a student completing a programmed learning course in English composition (Northridge) wrote in an evaluation: "This type of program can only be handled by students who are mature enough to know how much they can accomplish in the time given."

FOCUS: INDEPENDENT STUDY

A few projects have been sponsored by the Program which involve students studying a large block of subject matter intensively and independently under the direction of faculty. These projects, which have been at the upper division, degree major level, provide perspective on the usefulness of this teaching/learning strategy.

The San Francisco Alternate Major in Psychology offers the possibility for students to pursue the equivalent of 30 units of work through a relatively unstructured program featuring mini-courses organized around specific themes, advisory seminars in which students report on field experiences and independent projects which they have undertaken. In fall 1972, 131 students began the program,

each registering for an average of 8 units. In 1973-74, 75 students registered to work with six faculty in the fall program and 96 in the spring. One benefit of the program is the opportunity for students to be exposed to more subjects in the same period of time. The project evaluator noted:

> . . . Several important advantages to the alternate major's system of organizing courses become apparent. First, a very large number of courses have been offered. Using only six half-time professors, a total of nineteen courses were offered in the fall (1972) and twenty-four in the spring (1973). This does not include the advisory group with which each professor worked. A maximum of twelve courses could be expected from a comparable time commitment in the regular major . . . without advisory groups.

The evaluator, however, also found an initial lack of depth in the courses where students were required to take the initiative in leading seminars and defining work to be accomplished. "Very few students in each class completed either projects, papers or a fair amount of reading. This was very disheartening to faculty." A major recommendation of this initial evaluation, which has since been implemented, called for faculty to pay much greater attention to providing early feedback to students on performance, while continuing the self-directed nature of the program. In fall 1974 enrollment was 118. With an estimated 110 students expected in the spring, the program has reached a cost-effective 1:20 faculty-student ratio. The project also has had an effect in the department by encouraging development of a self-paced, individualized course in statistics involving over 100 students, two instructors and four sections.

At Sonoma, the Alternative English Major begun in 1972-73 also is in full operation. In this program, students pursue an individualized major, receiving variable credit depending on the work accomplished. Approximately 45 students are currently in the program which to date has had 20 graduates. The program is particularly attractive to students interested in creative writing and the media, areas of emphasis not regularly available in the department. The drop-out rate from this program is comparatively high, due to the self-discipline required. On the other hand, some students have accelerated or have found particular benefit from the flexible structure. For example, one student studying fiction writing observed: "I don't write in 3½ month, 4 unit chunks." It appeals as well to the more non-traditional student. A 42-year-old dentist, specializing in poetry writing, would have been unable to complete such a program if offered in the traditional manner in usual time blocks. The program, with four faculty members on part-time assignment, operates within a level of resources comparable to the regular upper division English program.

Through the Individualized Learning Project at Sacramento, students pursue work in their major on a full-time basis for one semester. In the initial phase of the project, students meet in groups with faculty on two occasions each week as well as in individual conferences. Projects developed by students in 1974 included the politics of ecology of the Tahoe Basin; a novel on prison life; Thomas Jefferson and John Adams; and the immigrant experience in the United States. The program experienced little attrition in its first semester's operation: of 70 students who enrolled for the program, two withdrew and one added for a net of 69. Student evaluation indicates dramatic results for approximately one-third, as intellectual skills were sharpened by intensive peer and faculty criticism. For another third, the gains were less dramatic, and were largely in the areas of increased ability to critically analyze readings and to develop clear and effective writing skills. The remainder probably did not gain significantly from the program. One student wrote. "My life, my work, and the project were all merged, whereas a traditional class is a more alienated, less personal experience." And another: "I have had good experiences in the 'conventional classroom' . . . I was on the receiving end of some very fine lectures and exciting discussions - but somehow this was different. It made one incorporate all the parts of learning and living and teaching."

In their first evaluation, the five project faculty paid particular attention to the shift of responsibility to students for deciding what would be interesting and important to pursue, for organizing their time, and for setting deadlines. They found anxiety and guilt on the part of some students. "Although I put in regular hours at school, I always felt I should be doing more." "My only problem is and always has been that of self-discipline." Yet in their final assessment the faculty observed that most of the students successfully developed confidence in their ability to assume responsibility for their own learning.

It is important in this overview to emphasize that students in the program were not registered for other conventionally taught courses but were in the program full-time. Further, this project involves constant and regular contact between faculty and students, singly, in small groups, and as a total group. For all its apparent success, however, the project yet has to meet an original objective: that of establishing a student-faculty ratio equal to, or surpassing, systemwide averages.

COMMENT: INDEPENDENT STUDY

These three projects share some common findings. Most important is the problem of the student's capacity to work on his own. There is evidence, suggested by the Sacramento effort, that faculty and group support, coupled with full-time immersion in the independent work, may result in minimum attrition and a high number of program completions. The San Francisco project stressed self-direction, initially with minimum on-going faculty feedback to students on their progress. The result was a less than a satisfactory effort on the part of some students in the program. Subsequent revision of the project has provided students with more supervision and a better learning focus.

These projects illustrate that independent study *is* attractive to, and effective for, some students at the degree major level. At Sonoma this represented about 10% of the English majors, including students attracted by the program who probably would not have majored in English otherwise. Similarly, the San Francisco program, has had little trouble in attracting students, and Sacramento, with extensive publicity, has been able to maintain a cadre of students sufficient to fully establish the program (76.5 F.T.E. fall 1974).

There is little evidence to suggest that programs emphasizing continuing and close faculty-student contact on an individual or small group basis with continuous student evaluation require *less* faculty time per full-time major student than traditional coursework. However, organized programs for independent study appear to be manageable without requiring proportionately rich faculty staffing. The greater individualization of programs to meet students' needs certainly can be viewed as a considerable advance.

Finally, an area of concern is the need to identify specific competencies, for all, or a significant portion, of the degree major. This problem, of course, is shared almost universally by higher education programs, traditional or otherwise. The Sacramento project faculty summarize the problem:

> Our evaluation of the amount of work accomplished by students, in comparison with a regular academic semester, is uncertain. Some students clearly read more and wrote more than, as one put it, 'ever in my life.' But there are real problems in judging what should be expected from a full-time academic commitment. Many students, whose work would not seem to have met the quantity standards we would have anticipated, still said – honestly, we are sure – that they had worked substantially harder than in an ordinary semester. One conclusion to which we are led is that faculty often fail to distinguish in the regular curriculum between what they 'require' and what students typically do.

An evaluation of student effort and program impact, therefore, depends to no little degree on comparisons with traditional programs, the data on which are most often sadly lacking.

FOCUS: SELF-PACED LEARNING

Closely linked to the independent study projects which involve extensive curricular content are those activities sponsored by the Program which involve self-paced learning within the context of a single course or a sequence of courses. The greatest number of individual projects supported by the Program have had self-pacing as their primary emphasis. A sample listing of projects begun in the first two years includes:

Development of Modularized Courses in Several Disciplines (Carnegie/COSIP projects)	Bakersfield
Self-paced Courses in Introductory Psychology	Bakersfield
Mediated Courses in Mathematics	Chico
Self-paced Modules in Finance	Fullerton
General Education Sequence in Science	Humboldt
Self-Learning Modules in Nursing	Los Angeles and Inter-campus
Audio-tutorial Laboratories in Biology	Pomona
Integrated Chemistry Laboratories	San Diego
Self-paced Mathematics Course	San Jose
Self-paced Electrical Engineering Course	San Jose
Projects for Planned Change, Behavioral and Social Sciences	San Francisco
PSI Approach to Basic English	San Jose
Individualized Instruction, Freshman English	Northridge and Inter-campus
Programmed Learning Course: Phonetics	Stanislaus

A broad spectrum of subjects and disciplines is represented in these and other projects having self-pacing emphases. All of the projects share a common approach, differing in degree in their use of elements of a single model or several in combination. In self-paced programs, traditional course materials typically are divided into modules (i.e., smaller units) of varying content, length and depth. Some examples of self-paced models are:

- Laboratories in which students pursue a program of experiment and observation prepared by the professor. Time limits may be established for completion of a given series of assignments. These limits may be defined by the logistics of changing laboratory experiments.

- A single module may be required of all students, with self-selection of "satellite" modules to supplement material designated as essential. Additional modules may be taken in the number, combination, and time chosen by the student.

- Students may have the opportunity to pursue the modules for the course at their own convenience, usually limited to the time period of the academic term or year.

- Courses organized on a modularized basis may be offered on a variable credit basis, that is, a specific number of completed modules are required for the minimum prescribed

units of academic credit (e.g., ten modules completed at a 95% level of competency for 3 units of credit). The motivated student who successfully completes these modules may move on to additional work for which "bonus" credit is granted. Thus, the student receives greater quantitative rewards for qualitative achievements.

- Single modules standing alone, perhaps taking the form of a one-unit mini-course, may be used by the student as a method of self-paced learning within his total program.

- Directed research, correspondence courses, etc., are also self-paced learning models which have long been accepted.

There are a number of possible variables for each of these self-paced models:

- The extent to which there is a potential for student acceleration or deceleration.

- The instructional strategies emphasized: mediated instruction, programmed materials, lectures, small group discussions, and traditional research methods.

- Tutors, peer instructors, and student assistants are often an integral part of the self-paced learning model, as in the case of the PSI or Keller Plan model.

- Finally, conversion to a self-paced learning model may require a new perspective of the academic subject and new content conceptualization.

Projects employing self-pacing, like those stressing independent study (using the distinctions of this report), have encountered some common problems. As would be anticipated, one such problem is the motivation of the student to complete work on a self-paced basis. In addition, self-paced learning programs usually involve identification of learning goals (behavioral objectives). The more abstract the subject matter, the more difficult it is to define and measure these goals and objectives. Another problem is that faculty undertaking the task of placing a program on a self-learning basis seem to increase significantly the learning demands placed upon students. This probably is due to an overestimate of the efforts which students invest in traditional courses.

Structure and Deadlines: Self-Paced Learning

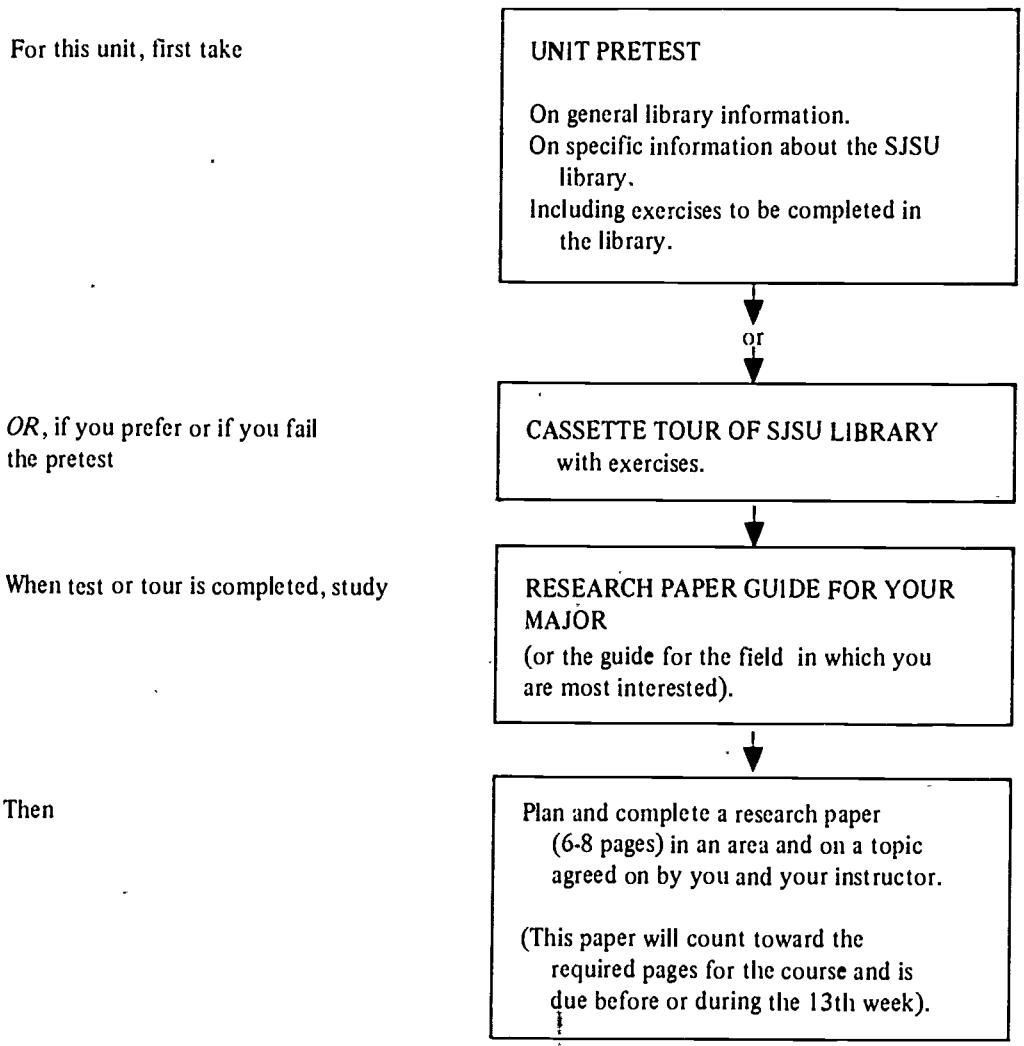
To overcome student motivation difficulties in self-paced learning projects, they tend to take on more structure and deadlines. In the process they move more closely to a programmed learning model as they seek to reduce student course incompletes. For example, one project director anticipated the motivation and procrastination problem while planning a freshman-level English composition course (San Jose) which ultimately used a modified PSI learning strategy:

> The PSI program is necessarily complex, including as it does prescriptive exercises in basic skills, in organization and in research, as well as the usual essay and fiction of a regular English 1A class – all of this tailored to meet individual needs. Many students feel pressured by the amount of time they think they will need to do all this, and yet confused by the fact that they need not meet in a classroom every Monday-Wednesday-Friday. Either because of confusion, or the lack of a fixed schedule, students tend to procrastinate, a problem which somehow seems necessarily married to this kind of program.

One possible solution would be to design a course which is as flexible as possible in the materials and the *kinds* of work required, but as rigid as necessary in the deadlines schedule and the amount of work required.

The diagramatic presentation of one module illustrates this project director's solution for combining self-directed work within a structure of organization and time.

ENGLISH 1A PSI **UNIT 7**



In the first semester of implementation of the English course, 131 students were registered in 6 sections. Students were not aware that the sections were being taught on an experimental basis when registering. Ninety-three percent completed the course, a figure comparable to other traditionally taught course sections. Outside evaluation of the experimental and traditional sections revealed that even in the implementation period, the innovation could bring about composition skills improvement equal to, although clearly not superior to, the more traditional mode of teaching composition. At

the end of the PSI course, students were more likely to be favorable toward writing tasks than students taught by the traditional methods. The students did not make use of extra help opportunities and did not have any desire to take another English course, regardless of teaching method. (English composition, however, is a required course for the majority of undergraduates in our system, regardless of major.) A pre-course assessment of the students' intention to take other English courses, which was *not* undertaken, would have allowed a better comparison of the instructional effectiveness of the two approaches. Though few of the students had prior experience with the PSI method, they expressed a strong positive regard for the PSI approach because it provided a more amenable social setting.

A contrasting experience is presented in the case study of a professor offering a self-paced course in Psychology, "Individual Differences and the Exceptional Person," in the Small College at Dominguez Hills. The instructor prepared a set of behavioral objectives for the course, both cognitive and affective, so that the students knew what they were expected to do, and so the instructor could assess when and if the objectives were attained. The instructor also designed a challenge examination based on the objectives which could serve as a diagnostic test to find the students' strengths and weaknesses, and as a final examination for the course.

"Individual Differences" was first offered in the winter quarter of 1974. The course included individual, student-initiated sessions with the instructor. About twenty students signed up for the course, but none completed the course in the allotted quarter, and only two students completed as many as six of the ten chapters of the textbook. Responses to a questionnaire sent by the instructor to the students to find out why they had not yet completed the course indicated that most had misunderstood the concept of "self-pacing," believing that it just meant going slower than normal. Most of the students also expressed a need for more structure in the course.

The instructor, therefore, changed the course for spring quarter, 1974. She tape-recorded an introduction to the course, including a description of the elements of self-pacing and suggestions for individualized studying techniques so that new students would understand the nature of a self-paced course. To provide more structure, the instructor scheduled a class meeting time during which students could discuss topics with her and take unit-progress checks.

Since no students had previously mastered the course, the instructor used those students who were currently taking the course as tutors for each other. They were permitted to master the units in whatever order they wished, so that by the middle of the quarter, each unit had been mastered by at least some students. The students then began helping each other.

The students responded enthusiastically to this method. Furthermore, since the peer-tutoring method used in this course is the same method often used for individualizing instruction for "exceptional" people in special education, the students gained first-hand experience with an educational method which they can use if they become professionals in that field.

The students rated the course favorably, and the instructor found that, in contrast with the completion rate for the winter quarter, sixty-eight percent of the students who were registered completed the course *before* the final date. All the elements of this course – the opportunities for self-pacing, peer-tutoring, continual and immediate feedback, and individualized instructional methods and materials – contributed to the favorable results.

The Bakersfield Experience: Limits and Values, Self-Pacing

Bakersfield has had perhaps the most experience as a single institution in developing and using modularized, self-paced courses, certainly in proportion to its size. In 1972-73, 893 students enrolled in 42 experimental course sections, in 1973-74, 768 in 56 courses, and in fall 1974, 191 in 16 courses. In the first year, incomplete rates by the end of each term were approximately fifty percent. Moreover, 43% of the incompletes recorded during the fall of 1972 had not been removed by the end of the spring term 1973. Initially little pressure was applied to students to complete experimental courses by the end of the term. Students were told that an incomplete must be removed within a calendar year. On the other hand, it should be noted that some acceleration did occur: of 154 students finishing work in 26 courses by the end of one term, 12% finished requirements by the end of the eighth week. In addition, 120 student credit units were earned above the minimum requirements for each course. In 1973-74, the rate of incompletes dropped to about 23% for all three terms (175).

Recently, Bakersfield has experienced somewhat diminished interest on the part of both students and faculty in modularized, self-paced courses. When given the choice between a self-paced course and a traditionally taught course, students now tend to choose the traditional format. On a campus of Bakersfield's size, this results in a course enrollment problem which makes offering self-paced courses uneconomical in some instances. At the same time, it should be noted that faculty believe students *should* have the option of choosing the traditional course in a given subject whenever an experimental course in the same subject is offered. While data are not available to suggest the reasons for diminished interest, it has been hypothesized that the student "grapevine" has spread the word that modularized courses may be harder than the conventional since it is quite clear that it is more difficult for a student to slide through a modularized course particularly when coupled with repeated examinations which are required before moving to the next unit of "mastery" work. Further, early efforts at Bakersfield to modularize certain humanities and social science courses have confronted difficulties not encountered in more concrete, skill-oriented courses.

For example, enrollments remain high in a logic course at Bakersfield, while a modularized religion course tended to draw low enrollments and is now under revision. As one faculty member put it. "The faculty who were most enthusiastic at the outset have now moved to a more realistic position as to what is possible, while those who were quite negative to modularized courses have moved toward a more positive or neutral stance."

A summary of findings of the Bakersfield experience suggests that:

- Substantial numbers of faculty on a campus can be involved in a concerted effort to develop new approaches to instruction. (The Bakersfield program has also addressed credit by examination and interdisciplinary team teaching, as well as other efforts.)

- Certain subjects are more appropriate for modules than others, both in terms of the work involved in preparing the modules and in terms of the suitability of the subject.

- Student resistance to innovation is more significant than faculty reservations. This resistance seems to be related to the fact that modularized courses not only call for greater self-reliance, but typically involve more work and continued demonstration of competencies.

- The payoff from the student standpoint does not appear to be great in that relatively few students see value in course acceleration, and instead seem to prefer to decelerate.

- The potential for self-paced learning has been gradually downgraded within existing modularized courses because of incompletes and student motivation.

- Finally, after some three years of experimentation, Bakersfield faculty have reached a plateau of interest and seem to be moving toward a consolidation phase.

San Francisco: A Decision to Reduce Self-Pacing

An experimental 12-unit foundation course program in International Relations at San Francisco was first offered in fall 1972, with substantial components of self-paced learning as well as innovations in group dynamics, criterion-based testing and peer instruction. With time, self-pacing has given way to more structured requirements.

In 1972, in an effort to separate skill-oriented learning experiences from those that concentrated more on knowledge, three self-paced, one-credit courses were developed within the 12-unit bloc: Discovering Data, Analyzing Data, and Presenting Data. The courses were modularized with a minimum competency specified in each module. Based on the knowledge that learning occurs among students at different speeds, it was expected that the average student would complete the three courses in one semester and a fast learner would complete the courses in much less time. Completion rates were far below expectations, ranging from a low of 14.2% to a high of only 43.4% during the three terms in which the self-paced courses were offered. Project faculty identified two factors leading to the difficulties encountered. Students within the International Relations foundation program were self-paced in only 55% of their work and they tended to meet the deadlines of the more structured aspects of the program. Moreover, the students often took other courses in addition to the 12-unit bloc, thus adding to the cross-pressures. The project director observed: "It is our experience, from interviewing students, that courses with tightly scheduled due dates take priority attention and push the self-paced activities into a distinctly secondary place of importance."

"...Our experiment in individualization and self-pacing has taught us and our students that guidance and motivational inputs are necessary and pacing must be predetermined in a closely integrated series of courses." Based on these experiences, the faculty proceeded to integrate the former self-paced learning units into the overall bloc program using the materials developed, but not encouraging student learning on a self-paced basis.

Benefits of Self-Pacing: The Nursing Example

In contrast to the above examples, the benefits of self-paced learning have been demonstrated to a substantial degree in other projects. In a Los Angeles School of Nursing program, fifteen of nineteen nursing courses currently offered in a new undergraduate program have more than half of their content prepared in a modular format for self-learning. These self-learning modules (SLM's) have been developed over a period of five years with a combination of federal, campus and, more recently, Fund for Innovation assistance. As a part of the extensive curriculum revision effort, the availability of SLM's in a self-learning center has contributed significantly to the campus' capacity to increase the student-faculty ratio in nursing programs. These ratios now stand at 16:1 in core courses; 10:1 in lower division courses, and 8:1 in options. The overall ratio was formerly 8:1.

Approximately 1,000 students per year use the SLM's at the Los Angeles campus. In addition, as a part of an inter-campus project supported in 1973-74 and 1974-75 through the Program, another 3,000 students are using ten of thirty video tape modules produced at Los Angeles through the 1972-73 Innovative grant. Ten additional SLM's were produced during 1973-74 on a cooperative basis, and 689 individual students used one to four modules at the six schools in a pilot test during fall 1974. Still other modules were produced during a special inter-campus summer workshop sponsored by the Fund and additional SLM's are projected to be developed during the current year. At the present time, 70 individual modules, each roughly equivalent to one hour of instruction, are available for inter-campus use through an SLM "bank" now under development and housed at Los Angeles.

Faculty who use the modules as required assignments prior to giving care to specific patients in the clinical setting report that students show increased independence and confidence, and are better able to evaluate their own performance. The program also has found that repeated experience in self-paced learning reduces student anxieties. An evaluation report states:

> The . . . students who came to the course with previous experience in self learning, seemed more content in utilizing their own resources, had few problems in mastering the material and developed their own system for gaining access to, and studying the modules. They were able to remove their focus from the learning method itself. These students were quite well prepared when they came to the clinical area.

Project reports for three courses at Los Angeles taught entirely on the self-learning mode (other than clinical experience) state that there was significantly greater faculty time spent in the evaluation of students than in traditional courses. The faculty spent from 10 to 60 hours, with 25 hours the average, in developing a content area into a self-learning module equivalent to the content covered in one hour of lecture. The development of modules was best accomplished when the faculty member was free from all other duties. This finding is reinforced by the experience of intensive workshop sessions sponsored by the Fund during the summer of 1974 when nine modules were produced in two, two-week sessions by 25 individual faculty.

An important feature of the SLM's developed in Nursing through the several projects mentioned, is their adaptability to different curricular patterns. Each module focusses upon a particular learning problem, with appropriate media and demonstration equipment. The modules may be used by different instructors at different points in a curriculum, and for differing purposes. At Los Angeles, modules produced for the nursing curriculum are also used by other departments. For example, a module on the diet of diabetics is used by the nutrition department.

A number of factors perhaps dictate greater success with self-paced learning in nursing than experienced in other projects described above. (1) nursing competencies can be specified relatively easily, (2) there is fairly common agreement on curricula at the undergraduate level in contrast to many other disciplines, (3) modularized instruction and specification of competencies is a current national trend, (4) nursing departments are under the pressure of high student demand and, at the same time, face system and institutional efforts to avoid "bleeding" other disciplines to support the relatively rich staffing required in the traditional program, (5) student motivation usually is high, adding to the incentives to complete self-paced work and to stay abreast of fellow students, (6) the substantial enrollments in nursing within a system such as the CSUC assures extensive use of modules produced, (7) smaller nursing programs see particular value in modularized material in subjects in which they do not have faculty specialists available, and most important, (8) the modules produced have been amenable to flexible uses within different curricular patterns. Nevertheless, even

at Los Angeles, only about one-third of those faculty using modules employ them as the major learning tool. The balance of the faculty use them in a supplementary fashion or assign modules without tying them to later clinical assessments of student performance.

Benefits of Self-Pacing: Some Other Examples

Other projects have met with considerable success in their particular applications of self-pacing. At Fullerton, for example, a course in business finance funded in 1972-73 was designed to employ a modified PSI approach to self-paced learning. Seven of the 14 sections in business finance are offered on the self-paced format using 15 modules. In fall 1974, 310 students were in the course on the self-paced format. Attrition in the course is comparable to that of the traditional courses – 17% for the PSI, 12% for the traditional (much of the attrition is due to the early screening in the course of those students who have an inadequate accounting background). Evaluations show that 95% of students completing the course favor the approach because of its flexibility and possibilities for independent attention by faculty and tutors. The program uses a large classroom as a resource room, open half a day for testing, tutoring, and study. One faculty and three to four tutors are always available in the room with its 20 testing stations where three versions of each examination are available to enable the student to achieve "mastery" of each module.

In another example, in fall 1974, an introductory business course at Fresno, normally limited to a maximum of 40 students was opened to all comers as a result of a different instructional strategy. The professor, assisted by two proctors, employed a combination of the Keller Plan and self-paced learning materials, dividing the course into eight modules, each with its own objective and essay examinations. Benefits of the program cited by the professor include the student mastery of basic concepts at higher levels than in traditional classes. In addition, attrition rates are low – less than 5%. Finally, the faculty member's productivity is increased by over 150%, offset by the cost of the part-time student proctors, who themselves, as graduate students, are engaged in a significant learning experience. The course is the outgrowth of a 1972-73 project in which the project director experimented with three modes of instruction, including use of videotapes. Based on this experiment he evolved his present teaching strategy. Since the time of the initial project he has served as the Academic Vice President of the campus and has been in a position to advise and encourage others in attempting new teaching strategies.

At Humboldt, lower division science courses for non-science majors have been placed upon a modularized, self-paced format, which includes a learning/testing laboratory. Although difficulty was experienced in the first year with student incompletes and "no credits" in the first course in the sequence, a 90% successful completion rate was achieved in the fall quarter 1974 in the same course. Reduction of incompletes, according to the Humboldt project leaders, is largely due to a module on self-paced learning which the student reviews at the outset of the course. Faculty also have made an increased effort to explain to the student what can be expected. The program operates at a student-faculty ratio of 20:1, which is approximately 25% greater than the ratio for conventionally taught lower division science courses on the campus. Further, substantial savings have been made in the use of facilities and costs of laboratory equipment and supplies.

COMMENT: SELF-PACED LEARNING

The foregoing presents a mixture of findings, some of which support the usefulness of self-paced learning in providing flexibility for student, faculty, and institution. Other findings indicate that student responses and motivations, as well as the faculty effort required to develop programs on a self-paced format, may not support the use of the strategy in certain areas. Some projects have

overcome student motivational problems through greater structure and by reliance on tutorial approaches. What has not been reflected is the belief of many project directors, and others close to experimental efforts, that self-paced learning adds a dimension to the student's experience which he or she might otherwise lack. This is a dimension of responsibility and self-reliance for learning.

Many faculty believe a student should not be "forced" to take a portion of his program on a self-learning basis, that it should always be an option. But, by the same token, students are universally "forced" to pursue all kinds of studies in a classroom/lecture situation. Though motivation problems are encountered in self-paced learning — as they are throughout life — is this sufficient reason *not* to embark on a method which requires, and more than likely will increase, many students' self-direction?

Short of this fundamental educational issue, evidence from the projects supported by the Program to date, as well as the state of the art throughout higher education, suggests that there *is* a place for self-paced learning, that it provides a meaningful educational option for some students. Perhaps the nursing project demonstrates this potential most clearly through the development of module banks for use by many faculty using differing curricular approaches. In self-learning modules, prospective nurses review basic material at their own pace for application in a clinical setting under the supervision of faculty. Program flexibility, the potential to make the best use of faculty time, and independent learning of basic materials are all present.

Evidence to date does not demonstrate that self-paced learning approaches necessarily result in substantial cost savings in terms of faculty time and effort or student acceleration. Incentives for many students to accelerate are not great. Apparently few students for whom experimental programs have been made available are interested in completing college work as quickly as possible. It is, no doubt, more reassuring for some to seek college credit through the comfortable and familiar traditional classroom setting. To hazard failure through self-pacing and self-discipline is a risk that many students do not seem interested in taking — indeed how can they tell whether they will gain something any more significant than they would otherwise? More work needs to be done in investigating ways in which students can be trained and *motivated* to become more responsible for their own learning. Self-paced learning efforts should identify clearly the kinds of students to be served and their educational needs. It is important to know more about students than is usually the case in this, as well as other, kinds of innovations. If the goal of college is to provide for individual learning, then self-pacing is a valid option for those who wish to pursue it.

FOCUS: CREDIT BY EVALUATION AND ASSESSING ACADEMIC COMPETENCIES OF GRADUATES

A major direction of the Program in its three years has been to explore possibilities of increasing opportunities for students to demonstrate their competencies and knowledge at college entrance, during their college career, and at the completion of their major. There are three major rationales behind this effort. (1) Students who already possess the appropriate academic knowledge through life experience, self-study, or work should be able to avoid unnecessary repetition of class work. Advanced placement, with or without academic credit, should become the rule rather than the exception for qualified students. (2) Students should be called upon to demonstrate what they have learned in terms of knowledges and skills at the degree major level through evaluation procedures certifying competencies. For some, the opportunity may be provided to demonstrate competencies acquired beyond the classroom which are academically equivalent. (3) Especially important in the assessment of achievement at the degree major level is the potential for program feedback to students, faculty, departments, and campuses. The department which believes it is teaching certain

skills and knowledges may not be fully aware of its successes or failures without demonstrable evidence based on comprehensive assessments of its graduates.

Development of experiments to test the limits and determine the best applications of credit by evaluation and assessment of competencies has been perhaps the most difficult aspect of the Program. Several reasons can be cited for this difficulty.

The California State Universities and Colleges are teaching institutions, and as such, there is a strong tradition of viewing higher education solely from within the context of the classroom. The role of "certifier" for work accomplished beyond the classroom is foreign to most faculty, not only in our system, but in American higher education generally.

Faculty, to date, have had few incentives to provide opportunities to students to obtain academic credit by means of examination. In most instances the student seeking to challenge a course must find a faculty member willing to develop, read, and grade an examination, in addition to his regular workload.

Not only is credit by examination viewed as an add-on to workload, it is also viewed by faculty and administration as a potential threat to future teaching workload, for presumably (although it is not yet fully demonstrated) the student who might acquire the equivalent of a semester's work through credit by examination will be on the campus less time than would otherwise be the case.

Nationally available standardized examinations, such as the College Level Examination Program (CLEP) battery of General and Subject Examinations, are considered by many faculty to be inadequate in content and/or sophistication, and to measure only a portion of what they believe to be essential to a particular course or program.

In considering measurement of competencies at the degree major level, there is often limited agreement upon what minimum competencies a graduate in a given discipline should be able to demonstrate. One English major, for example, may have taken an entirely different set of courses covering different time periods and genre than another major in the same department. When the issue of "testing out" of given subjects is raised, many faculty assert that much is lost by not insisting that the student have the benefit of association with other students and the instructor in a learning situation. This they see as being as important as covering a given body of knowledge and demonstrating, through a paper and pencil test, knowledge of certain facts selected from the domain of material covered by the course.

Perhaps most significantly, the development of evaluation procedures, whether for one course or an entire major, is a complex task if the results of the evaluation are to be valid.

Credit by Evaluation

Several projects using different techniques have explored ways of expanding credit by evaluation. (The term credit by evaluation is used because of its broader connotations than "credit by examination.") In 1974-75, the Fund for Innovation has been supplemented by additional support ($134,000) specifically for these credit by evaluation activities, including continued offering of the English Equivalency Examination discussed below.

These efforts have included the administration, experimentation, and development of policies regarding standardized examinations including the CLEP battery and the New York Regents'

examination program in business. Projects also have been sponsored at the individual campus level to develop examinations together with self-study guides. In addition, one major experiment at San Francisco involves granting of general studies credit for past experiences assessed to be worthy of academic credit by faculty teams. The range of these activities will be described briefly:

CLEP General Examination Experiments. In fall 1971, two campuses in the system began experimentation with the College Level Examination Program's General Examinations using their extant campus policies regarding test acceptance and cutoff scores. At San Francisco, incoming freshmen were encouraged to take the five general education-oriented examinations which could lead to the awarding of a maximum of 30 semester units of credit. At Bakersfield, incoming freshmen were required to take the examinations. No costs were involved to the student in either case in this pilot administration. As Table 1 shows, substantial numbers of students at both institutions received credit, some the equivalent to a year of academic work. Follow-up studies of these initial test groups are continuing. Data collected to date indicate that those students receiving credit via these examinations on college entrance generally receive grades somewhat better than their classmates.

Lacking definitive data and norms in these first administrations, higher cutting scores for granting of credit were set at Bakersfield than at San Francisco. With some minor modification in policy, Bakersfield has continued to publicize the CLEP General Examination as an option for entering freshmen, while San Francisco has not. Table 1 summarizes available statistics concerning the 1971 San Francisco administration and for 1971-74 for Bakersfield.

Bakersfield: Follow-up studies of the 1971 group at Bakersfield disclose some significant findings. Of the 55 students who received 30, 40, or 50 quarter credits in 1971, 27 were still enrolled in spring 1974. These students would have had a headstart of approximately two-thirds of a year toward the baccalaureate. A survey of their records since 1971 showed that almost all of the 27 students were fairly consistent in taking a full course load each quarter. There was, however, no indication that these students as a group took advantage of the opportunity to hasten their graduation further by attending summer school. One student received additional credit by examination, seven completed one or two modularized courses. Grade point averages for the group averaged well above 3.00, with only one student earning less than a 2.5.

Fourteen of the 27 were eligible to graduate by the end of the spring quarter, including four eligible the previous quarter. Of the fourteen, eight graduated one full year early.

Of all students earning CLEP credit in 1971, 44% had dropped or transferred by spring 1974, compared to a rate of 53% for the entire 1971 freshman class. Finally, the students earning 30 units of credit had somewhat better grade point averages than those earning 40 or 50. They also carried more units per quarter. On the other hand, these students were more likely to leave the institution, while 79% of the students who had earned the maximum of 50 units and 61% of these earnings 40 were still enrolled in spring 1974.

San Francisco: Data from the San Francisco experiment show that 333 students received the equivalent of a year's worth of credit in fall 1971. (The actual number of the 333 who enrolled is not available, but is estimated at about 300.) By fall 1974, 152 or 47% were still enrolled. One individual graduated in June 1973 – after two years of full-time college work; 29 graduated in June 1974 and one in August 1974. An additional 30 are expected to graduate in January 1975. Thus, of the 333 who *could have* received a "three-year degree," 9% took full advantage of the opportunity, while an additional 9% will be graduating in three and a half years. The data also show that the average number of student credit hours (including the CLEP credits) completed by students remaining in fall 1974

TABLE 1

CLEP General Examinations Experiments
Bakersfield and San Francisco

TEST	Fall 1971 NUMBER TAKING	Fall 1971 NUMBER PASSING	Fall 1972 NUMBER TAKING	Fall 1972 NUMBER PASSING	Fall 1973 NUMBER TAKING	Fall 1973 NUMBER PASSING	Fall 1974 NUMBER TAKING	Fall 1974 NUMBER PASSING
ENGLISH								
Bakersfield	195	59	130	45	55*	21*	89*	29*
San Francisco	873	531	n/a	n/a	217*	79*		
MATHEMATICS								
Bakersfield	191	81	71	28	82	45	42	33
San Francisco	873	724	n/a	n/a	n/a	n/a	n/a	n/a
SOCIAL SCIENCE-HISTORY								
Bakersfield	176	54	113	41	91	38	59	19
San Francisco	873	583	n/a	n/a	n/a	n/a	n/a	n/a
HUMANITIES								
Bakersfield	156	57	108	19	82	18	56	18
San Francisco	873	594	n/a	n/a	n/a	n/a	n/a	n/a
NATURAL SCIENCE								
Bakersfield	144	61	118	58	83	47	54	34
San Francisco	873	567	n/a	n/a	n/a	n/a	n/a	n/a

PASSING	SAN FRANCISCO	BAKERSFIELD				TOTALS
	1971	1971	1972	1973	1974	1971-74
5 exams total	333	13	3	3	0	19
4 exams	158	23	8	16	4	51
3 exams	139	19	21	15	11	66
2 exams	101	25	25	22	17	89
1 exam	93	40	31	56	22	149
0 exam	51	77	53	29	12	171

Notes: Bakersfield cutting scores, 50th percentile; S.F. cutting scores, 25th percentile, 1971; S.F. policy currently suspended.

Bakersfield examinations mandatory for incoming freshmen in 1971; voluntary after 1972, no cost to student (usual charge $25). S.F., voluntary but with strong encouragement and no charge, 40% of eligible students took the examinations.

*English Equivalency Examination.

was 92, indicating that many of the "instant sophomore" group have not taken full loads during the past three years. One phenomenon may be at work as typified by this example. a nineteen-year-old student, because he feels he is ahead of the game already as a result of his CLEP credit, is far more likely to sample courses, drop courses he does not particularly find interesting, and generally feels more "flexible" in completing his program. Furthermore, he is in no hurry to graduate.

The academic performance of the group appears to be more than satisfactory: for those students who have graduated, the average G.P.A. was 3.31; for those still in attendance, the average G.P.A. is 3.08.

English Equivalency Examination (EEE). At the time of the 1971 administration of the CLEP General Examination test battery at Bakersfield and San Francisco, faculty criticism was directed particularly to the then existing English examination. The English Council of the CSUC, an organization of department chairmen, and freshmen English Coordinators from all nineteen campuses, agreed to survey other instruments with a view toward offering a substitute examination for future use. The result of their effort was the development of a new examination which combines a CLEP Subject Examination (Analysis and Interpretation of Literature) with two essay questions prepared and read by CSUC English professors. Essay scores are correlated with results on the objective examinations. The process has also included "control" essays written for benchmark purposes by students completing a year's work in freshman English on CSUC campuses, as well as by students at Stanford, UC Riverside, UCLA, and UC Santa Barbara in 1974.

As shown in Table 2, in 1973, 4,040 students took the examination; in 1974, 3,639. In the first year, 1,367, or over 33% passed,in 1974, 1,036 (about 29%) were successful. The slightly reduced numbers taking the examination in 1974 were most likely due to limited media interest in publicizing the examination in contrast to 1973 and, perhaps most importantly, the student grapevine which may have discouraged students who probably would not have passed in any event. Some evidence for the latter, was provided by results of the objective portion of the test which showed fewer scores at the very bottom and a rise in the mean scores by two points. There were recurring difficulties in 1974 in getting application forms and information to high school students through counselors. Pending University of California participation in the program may substantially increase the opportunities for publicity and student interest in 1975. The lower passing rate in 1974 was due primarily to slightly lower quality essay answers and more complex essay questions.

The program has disclosed one finding of no small importance. In the two years of the examination, readings of papers completed by students in freshmen English classes for use as norms in the reading process have disclosed little relationship between high course grades and high scores on the writing performance test. The Project Director concludes:

> Students are passing college freshman English, many of them with high grades, who either cannot or will not perform at the minimum passing level on the English Equivalency Examination.*** . . . If a passing, or even a high grade [in the course], does not mean the student can write passably, can we really claim that we have taught our students much about writing? If not, then perhaps a higher grading standard [in the course], closer to that which we use when grading the English Equivalency Examination, might preserve our claims for the course, even if such standards disagree with current fashions and trends in higher education.

Moving Beyond the EEE. In 1974-75 a concerted effort is being mounted to develop one or more additional statewide examination programs in general education at the lower division level. Three

committees are currently at work in the sciences, humanities, and social sciences. The task of these groups is to specify the kinds of evaluations required, review existing examinations, and recommend courses of action, possibly including development of new examinations or a combination of approaches, as in the case with the English Equivalency Examination. The work of these committees is difficult because of the concerns regarding the impact of credit by evaluation on faculty and program, limitations of existing, accepted evaluation instruments, and limits to the areas of agreement upon competencies desired in general education.

Coordinated with the above effort, is the continued review of CLEP subject examinations towards determining appropriate minimum system policies. A systemwide policy is currently in effect regarding a number of CLEP mathematics examinations as well as the English Equivalency Examination. In many instances campuses, such as Bakersfield, grant credit for passing of other examinations in the CLEP battery but they need not do so under existing system policies.

TABLE 2
CSUC ENGLISH EQUIVALENCY EXAMINATION

	1973	1974
Students Taking Examination Objective Test and Essay	4,040	3,639
Cost of test development and administration	$124,600	$110,585
Cost to Students, $15 to ETS for objective examination	$ 60,600	$ 54,585
Cost to CSUC system	$ 64,000	$ 56,000
Students Passing	1,367 (33.8%)	1,036 (28.5%)
Students Entering CSUC system[1]	1,104	829(est. @ 80%)
Student credit earned @ 6 semester hours students in CSUC	6,624	4,974
Resulting annual full-time equivalent students in CSUC	220.8	165.8
Cost to State per FTE student in CSUC	$295	$338

[1]Students not entering CSUC may receive credit at some private universities, community colleges or the University of California.

New York Regents' Examination in Business. A joint project of the Program and the statewide, degree-granting CSUC Consortium making use of state and Carnegie Corporation grant monies has been a two-year effort to administer the newly developed New York Regents examinations in business to appropriate groups of CSUC business majors on five campuses: Sacramento, San Luis Obispo, San Jose, Fullerton, and Los Angeles.

In the 1974 effort, 1,153 individual examinations were administered on five campuses. (Over 50 faculty were associated in the project.) The result has been the establishment of CSUC norms in respect to the tests as well as detailed critiques of the examinations and their content. Results are currently under review. Initial use of the examinations for credit granting purposes, perhaps in association with CSUC developed assessments, may occur within The Consortium's degree program in business administration. Individual schools of business will be provided results of the project toward considering use of the examinations for credit by examination in the regular major program.

Campus-Based Credit By Evaluation. Projects have also been supported through the Fund to test different approaches to encouraging credit by evaluation in the context of a single course.

The opportunity to challenge coursework has long been an option available to students. However, the availability of the option has often been more theoretical than real. For example, a recent review of challenge examinations procedures and policies on one campus concluded:

> What seems apparent is that, in practise, credit by examination has not developed into a *procedure* by which students are encouraged to challenge *any* college course, but rather certain courses have been identified as challengeable and specific examinations are being or have been prepared. This may not be unreasonable given the great amount of time needed to develop an examination that is to substitute for a course. A major concern of the departments continues to be the relatively large amount of time required to develop, administer, and grade examinations with no return to the department in the form of FTE.

Pilot projects in campus-developed evaluation procedures have been attempted in a variety of disciplines including: physics (Northridge), literature (San Diego); history (San Diego), sociology (San Francisco), administration (San Bernardino), psychology (San Bernardino); and industrial technology (Chico).

Results are not conclusive with respect to the extent of student interest and the relationship of faculty time investment to student credit hours produced. A program in credit by examination in lower division literature at San Diego, however, demonstrates a relatively successful effort. Over the four terms the program has been offered, enrollment data were as follows:

	Registered	Tested	Passed	
Spring 1973	30	13	8	
Fall 1973	29	16	12	
Spring 1974	29	28	24	
Fall 1974	25	17	13	(first part of exam.)
Totals	113	74	57	

Enrollments and student credit hours produced indicate that the program is marginal in terms of the 3 weighted teaching unit "fixed cost" assignment which it requires. Enrollments are modest despite significant efforts in publicity and the fact that the course meets campus general education requirements. There is apparent student interest, though it does not seem translated into registrations for the examination. A 1973 survey showed that, of the 1,736 students enrolled in literature classes, approximately 44% of lower division respondents indicated interest in taking at least one challenge examination. (The small number of students taking advantage of the option reduced concern on the part of other faculty that the program would replace classroom instruction.)

In great measure, this credit by examination course is a self-study program. Students are provided outlines of material to be covered and suggested readings. On the average, according to student evaluation questionnaires, it required 5.6 hours weekly during a semester to prepare for the examination. For those students who did take advantage of the option, 52% of the respondents stated that they would not, or probably would not, have enrolled in the course in *any* term if it had not been available on the credit by examination, self-study format.

Other projects have not met with satisfactory results. A 1972-73 project to offer credit by examination in Western Civilization at San Diego (a course which in the fall of 1974 had 25 sections) met with very limited student response. Twenty-seven students indicated interest, ten actually took the examination, and only two passed. The option was not offered after the initial test because of the low pass rate and limited student interest, even given the substantial numbers of possible enrollees. A sociology self-study credit-by-examination program at San Francisco seemed to meet initial success, but it could not be continued in its second year because of limited student enrollment. In the two semesters of 1973-74, about 30 students registered, but only one-third finally gained credit.

A different form of credit by evaluation has been under development at San Francisco during the past two years and has demonstrated much greater success. This program involves the assessment of student learning from experience outside the university for general education credit. The program has now reached a stage where it is economical to offer in terms of faculty resources required, as well as providing significant savings in the use of classrooms and other facilities which would be required if the students earned credits in the normal manner. The program includes student-faculty interviews, consultation, and preparation of reports or portfolios to demonstrate ways in which the student has learned from experiences. It has proved to be particularly attractive to older "non-traditional" students. A survey of 42 students who had completed the program, called Credit by Evaluation of Experiential Learning, disclosed the following:

- 60% believed the method of evaluation was "one of the best" and another 17% rated it between "average and one of the best."
- 69% believed the effort required to be above average, and 29% average to above average.
- The large majority of students found the process as demanding, or more demanding, in comparison with other courses; in the stimulation of new ideas, "excellent."
- 88% of respondents would have initiated the process even knowing what they now know.

Data from the project for the two academic years of full operation show the following:

	1972-73		1973-74	
Petitions completed	109		136	
Number of students	90		126	
SCU granted	453		709.5	
(Petitions referred to other areas)	13		32	
Petitions held for following fall term	7		14	
Petitions cancelled	–		23	
Attendance at initial meetings	164	@ 13 meetings	191	@ 10 meetings
F.T.E. per year	30		47.3	
Faculty assigned	1.25 FTEF		1.0 FTEF	
Student: Faculty Ratio	12:1		23.7:1	

Distribution of Experiences Presented for Evaluation for Which Credit Was Granted in 1973-74

Business – 26%	Media, writing, arts – 14%
Comm. Service – 13%	Science related – 9%
Education – 26%	Residence abroad, language – 12%

The San Francisco project by its second year appears to have demonstrated that a program and organized process for awarding credit by outside academically-relevant experiences can be maintained within resources comparable to those required to provide instruction at the lower division level. Student response continues to be significant. In fall 1974, 67 petitions were active indicating a level of about 130-140 petitions to be completed in 1974-75. A workshop for interested faculty within the system is planned for April 1975 to demonstrate the San Francisco approach.

Assessing Academic Competency of Graduates

During the past three years faculty on a number of campuses have examined ways in which knowledges and skills at the degree major level can be assessed apart from the student evaluation occurring within individual courses. These efforts have been sponsored by the Fund for Innovation and Improvement in Instruction and have identified a number of possibilities which could eventually lead to improvement in instructional quality. They have served, as well, to illustrate that developing valid measures of student accomplishment in various fields is a difficult task.

To date, the subject areas which have been under examination either at the departmental level or on an inter-campus basis have included recreation (Hayward), economics (Northridge), political science (San Francisco), business (inter-campus), international relations (San Francisco), and, in a preliminary fashion, history (Long Beach). Results of these experimental efforts have been supplemented by findings from other projects. Chemistry, accounting, political science, and international relations are areas which are building computerized test item data banks which can be used for competency assessment of students in their major as well as at the lower division.

The process of identifying competencies expected of the graduate of a given discipline goes to the heart of curricular organization. To develop measurement devices, faculty must be able to agree upon which competencies are, in fact, important to their graduates and consonant with the goals of the college or university. Typically, departments as yet do not go through a program of review which focuses on defining minimum skills and knowledges expected of graduates. The problem is more pronounced within disciplines where there is no agreed-upon course sequence required of *all* majors. Thus the more heterogeneous the requirements for a major, the more difficult it is to agree upon competencies for all majors. For example, in a predominantly sequential degree program such as mathematics, senior-level courses essentially perform the assessment of graduate competency functions. However, in subjects such as English, one graduating senior may have had a totally different course sequence experience from another graduating senior in the same program. Competency based education may have potential for reduced instructional costs by allowing for better course design and by making education more effective from the student's standpoint.

The most promising approach to date appears to be a taxonomy for each discipline of concepts, skills and knowledges jointly developed by many faculty, ideally across institutional lines. From such a taxonomy various kinds of possible measurements may be identified which could assess student competency in his major subject. Given departments stressing certain desired skills compared to others would select the appropriate measurement instruments. The political science "Major Assessment Profile" is pursuing this approach with support from the Program. The process is complex, and care must be taken lest the process result in an undesirable homogenization of programs. It is also initially costly in terms of faculty time and effort.

Perhaps the most important value of efforts to comprehensively assess graduates or students in mid-major is the opportunity this provides the program or department for assessing its own performance. A given course or requirement may be designed to meet a particular student skill need, but yet prove to be ineffective. On the other hand, certain elective elements may, in fact, contribute more substantially to desirable outcomes. Finally, in many disciplines, employers and alumni may provide the best source of feedback in terms of competencies required to effectively function in a particular occupational area. Their input thus becomes most important in the process of development of competency measures.

Though much has been said about the need to emphasize competency-based instruction and certification in terms of competencies, when the upper division, degree major level is reached, implementation is indeed a most complex and extended process.

COMMENT: CREDIT BY EVALUATION AND ASSESSING ACADEMIC COMPETENCIES

The effort required and limited incentives have hampered Program efforts to experiment with standardized examinations for the awarding of credit, with campus-based credit by evaluation programs, and with efforts to define and measure competencies at the degree major level.

In large measure dependent upon faculty initiative to develop and conduct pilot projects, too little experimentation has been undertaken with campus-based examinations to allow us to state categorically if there should be system encouragement of the credit-by-evaluation option beyond that which now exists. Available evidence raises doubts that there is interest among sufficiently large groups of students to warrant substantial expenditures of faculty resources on the development, publicity, consultation, and evaluation required to award credit to students who clearly can demonstrate familiarity with the subject matter of a given course. Programs to evaluate off-campus

experience, however, seem to hold promise at least for general education and to be of interest to sufficient numbers of students for efficient implementation.

Incentives for faculty to develop and administer challenge examinations are lacking. Given the apparent limited interest of students in given subjects for credit by examination, often there is a practical difficulty in being able to assign a professor appropriate workload credit at the time he or she is working with students pursuing credit by examination. If the option of credit by examination at the campus level is to be encouraged, new procedures and policies *must* be developed to encourage campuses and faculty to offer the option. Today, attitudes and procedures almost uniformly work to discourage it.

A somewhat different situation is apparent in the use of externally developed examinations which are administered systemwide, as is the English Equivalency Examination. This program is economical in cost to both student and to the system and, for substantial numbers of students, it provides an important option. Yet, the impact of the numbers of students "testing out" of English courses is not so great as to result in marked reduction in course sections at any one campus. (For example, the numbers of students passing the examination and registering at a CSUC campus ranged from 6 at Dominguez Hills to 114 at Fullerton, the average was 58.) Continued emphasis seems warranted in maintaining the English examination program as well as in identifying other appropriate evaluation programs in general education which can be made available to incoming lower division students.

Finally, the assessment of the competencies of the graduate has yet to be addressed effectively by the Program, or the system, as a whole. In the coming year, the political science project, perhaps as sophisticated as any of its kind ever attempted nationally, may shed some light on the potential for carefully organized processes for identification of disciplinary concepts, coupled with use of instruments to measure student and program progress toward defined objectives. This process is costly and requires the most able of faculty. Yet it continues to hold major potential for program self-improvement as well as for measurement of the quality of the program graduate. There is some evidence of increased faculty, as well as student, attention to the *meaning* of the baccalaureate. To some small degree this may be the result of Program projects, but to a greater degree it is the result of developing concern about programs in general, conclusions of campus self-studies, and the external environment in which graduates find themselves.

FOCUS: THE MEDIA AND INSTRUCTION

Education has long made use of a variety of media in the teaching and learning process. The spoken and the written word, pictures, motion pictures, recordings, television, and the computer have all been integrated into the educational process to a greater or lesser degree. One Program goal has been to increase the level of sophistication in the use of media in the CSUC system for use in solving learning problems. Several Program-sponsored projects have employed the newer media as the primary instructional vehicle. A sampling of these projects include:

Instructional Television Art Course	Chico
Self-paced, Mediated Art History Course	San Jose
Experiencing History	Long Beach
Computer-augmented Learning and Illustrating Facility	Pomona
Computerized Test Item Banks (SOCRATES)	System and Inter-campus

Video Tapes for Earth Science Curricula	Inter-campus
Lower Division Course Materials for Non-Science Majors	Inter-campus
Instructional Television in Nursing	Los Angeles and Inter-campus
Experimentation with Video-cassettes (Four courses SPIRIT project)	Northridge
Bibliographic Aids for Social Science	Fresno
Musical Ear Training	Northridge
Videotapes in Special Education	San Jose and Inter-campus
Self-guided Geography Field Study	Fresno

Experience in these projects, as well as others, reveals the importance of selecting the medium appropriate to the learning or instructional problem, rather than adapting the learning problem to the medium. Further, the selection of the least costly medium appropriate seems most often the best. If mistakes are made, revision is more likely to be feasible. Finally, in using media such as television, the smaller the module or unit, and the more adaptable it is to a variety of learning situations, the better. A course placed on videotape which must be used *in toto*, or not at all, will be difficult to adapt to another instructor's or department's approach to the given subject. If, however, television modules are developed on the basis of discrete concepts, usage by a variety of faculty for differing purposes and audiences is enhanced.

An Exemplary Project: Mixing Media

Use of media is often tied to self-learning or self-paced learning programs. A well-designed program may use a variety of media. One exemplary project, supported by the Program, is in art history at San Jose. In this course, which was developed in 1972-73, students view a weekly film from the Kenneth Clark *Civilisation* series, spend two or more hours in a learning laboratory viewing film strips and listening to audiotapes following an independent study guide, and complete readings in a textbook coordinated with the mediated materials. Short quizzes are administered in weekly discussion sessions conducted by the professor and graduate assistants to provide students with feedback of their understanding of material.

The success of the pilot phase is shown in several ways. In one semester only one of 89 students dropped the course. Evaluation of the program disclosed that 70% of the students preferred this method to conventional course sections; 80% spent more study time than in traditional classes; and 71% felt they learned more than they would have in a conventional course. More important is the fact that students completing the course scored significantly higher in content examinations than did students in the traditional art history sections. The program is continuing with an anticipated enrollment of 90 students in spring 1975.

In response to publicity given the program, duplicate sets of the media materials have been produced with Program duplication and dissemination funds for use at Dominguez Hills and Pomona. Once learning stations are available, each campus will be able to serve up to 100 students each term with the available materials. Interest in the program has also been expressed by community colleges and a private university in the state.

From a perspective of two years in the development and implementation of the project and with the benefit of student and outside professional evaluation, the project director summarized the

advantages and disadvantages of using the audio-tutorial method in art history. Her summary reflects in great measure the findings of other similar projects:

Advantages

- Most students learn more from the audio-tutorial method.
- Most students prefer the method for one or more of the following:

  They can learn at their own pace; they can work ahead, or make up missed materials.

  They can emphasize the instructional method that best suits their individual approach to learning.

  The visual materials can be repeated for study purposes.

  The clear designation of objectives helps them study efficiently.

  Small discussion groups create active, rather than passive, involvement with material.
- The course provides excellent training for the graduate students who serve as discussion leaders for academic credit.
- The materials have interdisciplinary potential.

Disadvantages

- Students spend more time studying.
- It is difficult to change material.
- Equipment failure creates frustration and wastes time.
- Some students seem to miss the "lecture mystique."
- There is a loss of direct control by the professor, who must depend on graduate students, media, and equipment technicians.
- The traditional lecture is the cheapest way to present art history to large groups.

Another course which makes use of a combination of media is the "Experiencing History" program at Long Beach. In this project, the computer, video, and audio-tapes are integral parts of the learning process. "Experiencing History" kits for five courses are being developed including: the Franco-German experience, 1880-1918; *War and Peace;* The Reformation; The Americans, 1740-1776; and the Craft of Rebuilding a Culture. A book also is being prepared to present the "experiencing history" technique to faculty.

The project is interdisciplinary in both content and implementation. Each class meeting places the student experientially into a historical situation which is maintained throughout the three hours of class meeting, usually held on Saturday. The experience is reviewed at the end of the class. In order to "simulate" the process of acculturation in the past, full use is made of social game theory, based on interactions among the students and with the instructor. Students participate directly in the development of the social games and the media, and they become productive elements in the class "culture." The approach is receiving favorable response from faculty from a number of institutions. Student interest is significant, though to date evaluation of the strategy in terms of learning results has not been completed.

Media and Field Experience

Independent study and field experience can be enhanced by mediated course packages. One example is a self-guided field study in the geography of the Sierra Nevada Mother Lode country currently being developed at Fresno. A package is being provided students which will include audiotapes, a field log, a trip guide, a bibliography of references cited on the tapes, a recorder, self-study exercises, maps, and pictures which show historical changes in the area over time. Students will take a three-day tour armed with these materials. On its completion they are examined and submit written materials prepared during the tour. Project directors report the only difficulty encountered in developing the course (apart from the usual one of requiring more than the expected amount of time to develop the modules) resulted from the inaccurate odometer of the state car used to make initial point-to-point measurements for the trip guide.

Unsuccessful Examples

Two projects supported through the Fund in 1972-73 which made heavy use of media could be termed "unsuccessful" because of their high costs in relation to the number of students involved. An experiment at San Diego was intended to make use of British Open University materials in mathematics. However, despite extensive publicity and local media support of the program, too few students were interested to warrant continuance of the project, which was cancelled in fall 1972. Experimentation with the British materials at other institutions in the country has shown that they appeal to students who have strong academic interests and who are accustomed to presentation of material in relatively traditional ways. Interest in the mathematics course at these other institutions has proven to be the least among the available courses.

The Weekend College at Long Beach, which presented two interdisciplinary, multi-media lower division courses each Saturday of its one year of operation, found substantial student response and faculty enthusiasm. Because of its heavy dependence upon film and video, much of which was developed in the context of offering the course and could not be reused, the courses proved too costly for the campus and the Fund to support on an ongoing basis. The concept of courses offered on the weekend is, however, being implemented by the campus in other subjects, but in more traditional ways.

The Computer: One Medium to Support Instruction

For a number of years the computer has been used for providing instruction. It has been used most often for providing drill in basic subjects, for performing and providing simulations and, of course, for the processing of data used in instruction. Coupling of the computer with visual display devices has further increased its capacity to either provide instruction or "manage" instruction in self-paced learning situations.

As an efficient storage mechanism for data, the computer can be most useful as an aid to instruction. The Program has supported, throughout the past three years, an effort to build test item data banks which can be accessed by the instructor for use in student evaluations. The potential advantages for computerization of test items are many. The professor, by indicating certain criteria, may have a test generated to his specification. Test items placed in the bank normally will be more carefully drawn than those which a professor can prepare on his own. The computer can maintain statistics on given test items including how often students answer the item correctly, and can provide feedback information to the professor on the performance of his students on given questions in comparison to other groups of students.

Beginning in 1972-73, the Program has supported the preparation of test items to be placed within the computer in subjects ranging from mathematics (San Diego), physics (Dominguez Hills), chemistry (Dominguez Hills and Long Beach), to accounting (Long Beach). Individual faculty are adding items in other subject areas as well as contributing to existing banks. In order to provide the most efficient computer program and system for providing examinations, the Program, in association with the CSUC Division of Information Systems and faculty at Chico, has sponsored Project SOCRATES, which is a computer program as well as a total system providing for the in-put of test items, the process of preparing examinations and their scoring. It also has the capacity to produce aggregate data on student performances on test items over time. The system is in the final stages of development and is moving into a phase in which it may be publicized to faculty.

The potential for use of this system is promising. At San Diego where mathematics test items have been available on the local system (they are now within the central system as well), over 2,200 students a year have been given tests generated from the college algebra, trigonometry and intermediate algebra bank. The tests are used for placement and course testing. The bank is now also being used at the campus in a self-paced, individualized course in pre-calculus mathematics supported by the Program in 1974-75. In fall 1974, 450 students in 9 sections of the course were taught on the individualized basis under the direction of one faculty member on a three-quarter time assignment, assisted by three graduate students and 31 proctors. In the spring term, 600 students are expected to take the course.

A status report on test items in place in the SOCRATES system as of December 1, 1974 showed the following:

Astronomy	475	Economics	264
Chemistry	3255	Tests and Measurements	1439
Biology	3107	Psychology	2551
Data Processing	1374	Mathematics	2810
Physics	1956	Counseling Theory	1472
History	10,000 +		

While many problems, both of a policy and a technical nature, have been successfully solved so that the SOCRATES system can become operational, many major areas of concern remain before the full impact of computerized testing can be determined in the CSUC. Special resources will continue to be required to maintained the system and to provide service to faculty. Furthermore, the development and revision of test item data banks is important if they are to keep pace with changing demands of instruction. Continued support for preparation of test items and their review by discipline "editorial boards" is required. The system is only now approaching the stage where controlled experimentation in faculty usage of the test banks can be performed. While encouraging, the San Diego experience is the only major system demonstration to date of the potential for its use.

A similar use of the computer as a repository for data for use in instruction is being made within a project at Pomona. During the current year, faculty and students are coding and placing into the computer data relating to all aspects of the environment and energy sources. These data can be accessed for use by students in an experimental instructional program in multidisciplinary techniques, supported by the Program in 1973-74, as well as being available to students, faculty and researchers on the Pomona campus.

Television and Instruction

The Fund has sponsored projects designed to explore effective use of instructional television (ITV). These pilot experiments were undertaken in light of continued legislative interest. For example, in 1972-73, the Budget Conference Committee recommended that funds for ITV should be allocated only to those campuses "which can demonstrate a high faculty demand and a program which maximizes the use of ITV facilities towards instruction activities."

Resources available to instructional television through the support budget are limited, and it is not considered feasible to fund pilot projects by transferring funds from on-going ITV programs on some campuses to new programs on others. Instead, the approach chosen was to hold a special competition which could be supported from the Fund for Innovation and Improvement. The selection criteria were consonant with recommendations of a 1971 report of the Office of the Chancellor on instructional television and paralleled the two criteria expressed by the budget recommendation: that is, campus willingness to mount ITV projects, and the existence of an active ITV program.

The campuses which met both criteria and were selected to implement pilot projects were Los Angeles, San Jose, Chico, and Fresno. In addition, Dominguez Hills was selected as a campus which demonstrated interest in the use of ITV, but which had no television capability of its own, and Northridge was selected as a campus which showed strong support for ITV and which had a developing TV facility.

Los Angeles: Nursing

In 1972-73 Los Angeles began work on two coordinated efforts designed to produce self-learning modules (discussed above) and videotapes for use in nursing core courses. The project produced 27 instructional television modules of 10-30 minutes duration, which could be used in a wide variety of nursing courses. The average cost per television module was $2,000. Throughout the project special techniques and procedures were used to capitalize on the unique nature of the subject matter and the special characteristics of television as an instructional medium. Avoiding the traditional illustrated lecture approach, the modules are presented from the standpoint of the nurse-patient relationship, interwoven with additional factual material. The result is what has been termed "instructional documentaries." During 1973-74 the modules were tested with positive results by 1000 nursing students at Los Angeles, in conjunction with other self-learning materials. A follow-up test was made with 17 faculty and 570 students on three other campuses, San Jose, San Diego, and Chico, using selected modules.

San Jose: Special Education

At San Jose the preparation of videotaped materials to serve as the principal learning resource in core courses in special education was supported by the Program. Over 40 hours of videotape were produced, at an average cost of $700 an hour. Extensive supporting written materials have been prepared as well.

The materials were prepared in the form of observation of different kinds of individual behavior and the techniques for dealing with them. They were designed to reduce the need for field visits by students, and to provide instead an opportunity to observe typical behavior situations in the classroom or in the self-learning mode. The videotapes were produced to be used in conjunction with other materials. In order to ensure widest possible applicability they were presented in a segmented library approach, each tape dealing with a single concept or small group of related concepts, rather than a complete course. The tapes are currently being used by 240 students at San Jose, and the project is entering a phase where they will be disseminated throughout the system. The potential audience is estimated at 2,800 – 3,000 students per year within the system. National distribution is also a possibility.

Chico: Art

In 1972-73 Chico received support for the development of the televised portion of a course in the fundamentals of art. The project resulted in the production of 13 half-hour videotape modules, plus another 40 ten-minute concept videotapes. The average cost for a block of televised instruction was $2,400. In addition to the televised materials, mediated teaching packages were produced for use within laboratory sections. An important aspect of the project was the successful effort to involve community college faculty as advisors in its development, with the intent of including community colleges in the implementation phase. The materials are being used in a course presented on the Chico campus with an enrollment of 42 students in fall 1974. Plans to include the community colleges through use of the local open-circuit public service television station have been delayed by technical difficulties. Approximately 140 students are expected to participate on the Chico campus in spring 1975.

Fresno: Business

In an attempt to determine the relative effectiveness of television as the principal teaching method as compared with live instruction, a project at Fresno in business used programmed learning materials, frequent testing, and simulation exercises for another group. Project results demonstrated that the non-televised mode of instruction was achieving better results than the televised lectures. The professor in charge then discontinued use of the television portion. He now uses a modified PSI approach to teaching the course.

Dominguez Hills: Tests and Measurements

To assist in making cost comparisons in a tests and measurements course, a project at Dominguez Hills used three different instructional methods:

1. Teacher centered – students attended conventional lectures with frequent testing and feedback.

2. Structured/mediated – students met for five periods each week. At four of these periods they were given a half-hour videotape presentation. The videotapes, which had been developed previously at Los Angeles, were followed by small group discussion. The fifth period was devoted to testing, using a computerized test item data bank.

3. Self-paced/mediated – students had very little contact with an instructor and viewed the videotapes at their own convenience without a following group discussion. When the students felt ready to do so, they took progress tests. (Unlike the other two groups, which consisted principally of undergraduates, this group was made up predominantly of graduate students in education.)

The results showed no significant difference among the three groups in performance on the final examination. Comparative drop-out figures, however, were significant. The teacher-centered group had 29 of 32 students complete the course; and the structured mediated group had 48 completions for 49 students. The self-paced mediated group, however, had only 36 completions out of 100.

The comparative costs of conducting a structured mediated program indicated that, over a three-year period with an annual enrollment of 800 students, this mode of presentation would result in a savings of about 30% over a traditional teacher-led curriculum. This scale of enrollment, however, probably could be achieved only by offering the instruction on a multi-campus basis.

Northridge: Four Courses

At Northridge a program was developed in the use of ITV combined with self-pacing techniques. The project, named "SPIRIT" (Self-Paced Individualized Retrieval of Information by Television), extended over a two-year period, and resulted in the production of 120 discrete half-hour videotaped lectures and demonstrations in support of four courses in geology, art, engineering, and radio-TV-film. The average cost of a half-hour TV program was $550. Approximately 400 students are using the video cassettes each term.

In one of the courses, evaluations showed that student performance on final examinations was markedly superior to that of students taught in the conventional format in the preceding two years. Student reaction to the mediated format was 64% positive, 13% neutral, and 23% negative, moreover, 82% of the students said that they would enroll again in such a program. An inter-campus extension of the geology section of the original project will serve 1000 students on three campuses by 1975-76. Demonstrations of these mediated materials will be held during spring 1975 to encourage other faculty to participate.

The SPIRIT project had five specific objectives:

1. To develop an innovative, but realistic, new format for the use of television in the instructional system specifically utilizing cartridge/cassette technologies.

2. To devise a flexible instructional approach which makes more efficient use of faculty and student time, with less structured contact (and provision for more informal contact) than the traditional lecture-discussion format.

3. To structure an instructional configuration which encourages and necessitates more student responsibility for his or her own individualized learning program.

4. To utilize credit-by-examination techniques whereby students are assigned credit on the basis of successful completion of examinations or other measures of attainment of terminal course objectives.

5. To accomplish the above instructional objectives, and increase or at least maintain the present level of instructional quality, while potentially increasing the actual student/faculty ratio, yet at the same time providing opportunities for individual student faculty contact.

Based upon the project director's evaluation supplemented by third-party data on student reaction and learning, it can be concluded that the above objectives have been met or are being met as the program continues. A new format has been devised using video cassettes. Presentation and learning

time, for both the instructor and the student, has been rearranged in a much more flexible pattern. The student has had to assume much more responsibility for his own learning program. To varying degrees in the four courses, the credit-by-examination approach has been adopted. And, as nearly as can be determined at the present time, the level of instructional quality is being maintained while the student/faculty ratio is being increased.

Subjective assessment by the project staff and faculty involved showed several weaknesses relating to the design of the pilot project. Not enough money was included in the original proposal for tape production which involved personnel and graphics, photographic, and staging support. The attempt to include four different courses during the first year of the project was too ambitious. It was too much to expect that a complete color television installation could be designed, specifications drawn up, proposals solicited, purchase orders finalized, equipment ordered, delivered, installed, and checked out in less than one semester. Instead of three-quarters released time for one semester for faculty developing materials, more solid planning could have been accomplished by arranging for one-quarter released time (for planning) in one semester, followed by one-half released time (for production) the following semester.

COMMENT: MEDIA AND INSTRUCTION

The Program through its several projects has not set out to determine if one medium of instruction is superior to another. Many, many projects have experimented with all types of media. On the whole these efforts tell us that one medium is about as effective as another, including the lecture medium. The Program, however, has sought to identify those specific situations in which a particular medium can be used more effectively than another. Further, the projects sponsored by the Program, as well as workshops and demonstrations over the past three years, have raised, to some degree, the level of interest in, and sophistication about, the media and the educational technologies available within The California State University and Colleges system.

Project directors have found perhaps the single most important element in placing courses and course materials on a mediated basis is the need for a systematic approach to course design. Further, the role of the media or learning resources center has become increasingly important, not only because of demands placed upon existing instructional support services by projects formally sponsored by the Fund, but by a general heightened interest in using media in instruction.

Projects have illustrated that faculty do find good and appropriate uses for media to improve their instructional programs. The videotapes produced in special education have met a need which could not have been met otherwise – field observation is simply too haphazard to guarantee that students will see the various types of behaviors which they are studying at any given point in time. Similarly, clinical experience for nurses can be enhanced by a student's previewing via videotape what she or he will encounter in a hospital situation. The audiotape permits the professor to develop self-guided field tours, or simply to record his lectures for students to review.

Attention, however, always must be paid to balancing the potential improvement of instruction through use of media with developmental and other continuing cost. In this case, special comment should be made about the use of television. Beginning in the 1950's many people believed that television would have an imminent and major impact upon all of education, as it displaced the live lecturer. Student, faculty, and administrative responses, however, quickly showed that a revolution was not in the making. Those who thirty years before had anticipated that radio would make fundamental changes in education also had been proved wrong.

Television, for many faculty, is an important teaching and learning tool, but primarily through supplementing or enriching courses offered on conventional formats. From results of projects conducted within the system, there is an indication that faculty are more likely to use instructional television materials developed by others when these materials consist of flexibly reorganizable modules, rather than as fixed courses of instruction.

In considering the use of any medium of instruction, the learning objectives and how they may best be presented should precede a decision for that medium. Too often in the past, the decision to use television has been made without determining if it is in fact the most appropriate medium. Production of quality television materials requires up-to-date equipment, trained technical personnel, and a stable budgetary base. Students are far more critical of "low-budget" televised instruction as they compare them with commercial products rather than a "low-budget" lecture. Limited budgeting levels for campus instructional television programs generally prevent the retention of professional personnel experienced in producing instructional materials. Television projects supported by the Program called for the hiring and training of technical assistants who were then discharged at the end of grant period, thus losing a "memory" for future project development.

Finally the cost-effectiveness of using television as the major instructional strategy must be considered over a three- to five-year period, taking into account the initial level of production costs, extent of continued revision costs and the numbers of students enrolled. The nursing and special education projects described have the clear potential of demonstrating the value of the investment of these resources. However, it is important to note that the wide distribution and use of materials in these projects, including the videotapes produced, have required the establishment of inter-campus consortia with special support from the Program for Innovation. Had this support not been available, inter-campus use would have been limited, and indeed this may still be the case if formal inter-campus organizations cannot be maintained through campus contribution, system support and/or outside income resulting from the sale of materials to institutions outside the system. Relative to this latter point, the bulk of income which may be derived from the sale of materials from such projects should be returned to projects for program maintenance and further development. If all income derived should be immediately returned to the state's General Fund to reimburse the state's initial investment, this would do little to enhance faculty enthusiasm for continuing to develop new materials and exchange one another's products, although the principle of recovery of initial costs is, of course, justifiable.

FOCUS: TIME-SHORTENED DEGREES

Ways in which students may be provided the option of shortening the time spent in meeting degree objectives have been explored by several different kinds of projects: credit by evaluation, self-paced learning, and independent study are among them. Since 1972 a major experiment in time-shortening has gone forward within the Small College at Dominguez Hills. In this college within a college, a faculty team has sought to reconceptualize general education and major programs so that a student may more quickly progress than would be the case in the conventional four-year program. Students are guided through the program which features modularized courses, credit by examination, credit for experience, independent study and thematic projects with the assistance of a faculty mentor.

The student body of the Small College is not an honors group; it reflects the student body as a whole at Dominguez Hills. For example, 28% of the students in the program were admitted under one of the several special admissions policies, including 10% who were admitted through the educational opportunity provision.

Not all of the options tried in the Small College are new, but collectively they have proved useful and profitable from the student standpoint, according to program evaluations. The approaches tried have included intensive one-week courses, variable length courses, variable unit courses; use of of courses in the larger college (70% of the students typically take some work outside the Small College); student teaching under the direction of faculty; peer tutoring; and self-paced, modularized courses.

Data show that in some measure the program is demonstrating through these options that a student may pursue his college work on a more intensive basis. Seventy-four (40%) of 182 continuing students recently surveyed have successfully completed 16 or more credit hours per quarter on the average. A total of 74.18% of Small College students carry normal loads (12 units or above) – a percentage significantly higher than for the system as a whole where the average CSUC student completes some 38 quarter units per year.

The California State University and College system is characterized by high student mobility. A comparatively small percentage of students enter a given college, remain in continuous student status and graduate from the same institution. The Small College seems to be no exception, based upon these continuation rates:

TABLE 3

CONTINUATION RATES

	F 1972	W 1973	S 1973	F 1973	W 1974	S 1974	F 1974
Fall 1972	130	89	68	51	50	45	33
Winter 1973		20	19	18	17	17	11
Spring 1973			26	22	15	15	19
Fall 1973				107	90	93	72
Winter 1974					24	22	13
Spring 1974						19	10
Fall 1974							134
TOTAL	130	109	113	198	196	211	292

The continuation rate of 40% of the entering fall 1972 student body to the following fall was disappointing. However, the total spring 1973 to fall 1973 rate of over 80% continuation exceeds the estimated systemwide 60% rate from the freshman year to the sophomore year. Improvement in the continuation rate from fall to fall occurred by fall 1974 where a rate of 73% was recorded, spring 1974 to fall 1974 showed 75%. The reasons for attrition in the Small College program are not fully

clear. The evaluator reports: "Students seem to be unafraid to be both critical and laudatory of the program while they are enrolled, but seem to be reluctant to express their feelings once they leave."

The Small College student body median and mean ages have increased to some degree since the beginning of the program as older women and veterans have entered. The program also has seen a shift from a fifty-fifty, male-female distribution, to 60% female. Ethnic surveys show the program includes 18% black, 12% Chicano, 5.5% Asian, and 63% caucasian.

An independent evaluator of the Small College program in 1973 concluded that the goal for the Small College in respect to time-shortened degrees should be:

> To test whether a means can be provided whereby a number of students (from one-quarter to one-third) may obtain a bachelor's degree in three years, with the remainder taking proportionately fewer years than the systemwide range of time to degree completion.

Of the 33 students remaining from the original fall 1972 class, it is estimated that ten (less than 8% of the entering group of fall 1972 and 30% of those students remaining) will receive their degrees by June 1975; that is, in the three-year period. In addition, 12-15 students who entered with some previous collegiate work will have been graduated, many after accelerated progress in the Small College. (Nearly 40% of the students have had some college work including 9% who have completed the lower division.)

Finally, student interest in completing the degree in three years seems to remain high. A spring 1974 survey showed that 55% responded "yes" to the question, "Do you want to complete the baccalaureate degree in less than four year?" Another 30% stated they "would like to."

COMMENT: TIME-SHORTENED DEGREES

The Small College experiment seeks to attain time shortening through comprehensive curriculum changes and a variety of learning strategies. In foregoing sections, different types of projects and activities have been described which can lead, for some students, to time shortening of degree programs – or at least the potential for it. A small number of students who received credit through the 1971 CLEP experiment have graduated in three years from Bakersfield. A greater number graduated from San Francisco. Students passing the English Equivalency Examination have the option of taking six semester units-worth of classes less during their college career, or they may take other subjects including more advanced English courses. Modularized and self-paced work may enable students to complete a given course before the end of a term and perhaps to move on to pursue additional work which they could not do otherwise.

Another option is available to some students to pursue college-level work while in high school. A project supported in 1973-74, also at Dominguez Hills, explored a number of issues and models regarding the interface between high school and college. (See, *Project Overlay*, CSUC, January 1975.)

There is, as yet, no clear indication of the number of students in our system who are interested in making use of options which may result in their completing degree programs earlier. The very limited use by students of three-year degree options available nationally, together with anecdotal data, suggests that the prevailing attitude is one of "What's the hurry?" Despite the Carnegie Commission

reports, the average student does not appear in any rush to leave the academy. Those who are motivated to do so are, however, a significant enough number to warrant the opportunity being available. There is evidence that many high school seniors are motivated to begin college work earlier than they now do. To the extent that this is facilitated, one kind of time shortening occurs.

Looking at the college experience itself, the Program's results to date suggest that self-paced courses in themselves lead only indirectly to time shortening of *total* programs. No academic programs are presently available which provide an extended sequence of self-paced, modularized courses sufficient to determine if students, in fact, actively will seek this approach to reduce the time required to complete degree programs. Testing at entrance in lower division, general education subject matter continues to be a promising vehicle for time shortening. But as described earlier, many freshmen who tested out of up to a year's worth of work did not seem to take full advantage of this potential for acceleration.

Time-shortened degree programs require a reconceptualization of the meaning of the baccalaureate. As indicated in the discussion of assessing competency at the degree level, this is a major task, and one which cannot be accomplished by piecemeal approaches. The Dominguez Hills experiment is merely a suggestion that there is a significant, possible interest.

On the Third Day . . .

Regardless of where participants spent last night, by the foregoing instructions find the parking lot at the south end of Columbia. Begin the day's work from the parking lot. Before turning on the tape have all ready for use the Columbia 1:62500, Columbia 1:24000, Columbia SE 1:24000 and the Sonora 1:62500 topographic maps, the 1858 map of Columbia . . .

— *From an audiotaped self-guided field trip in geography.*

Some Reactions to Innovations Are Negative . . .

As you will no doubt figure out by my test scores. I believe this course was a total flop . . . I hope to repeat this course under a human, not a cassette player.

—*On an audio-tutorial art course.*

Student Self-direction . . .

In the spring semester, I took much less of a role in organizing and directing the seminar. The encouraging thing . . . was the way students took over responsibility for the direction of the course. Students led us in Gestalt awareness exercises, listened to a Fritz Perls tape, saw film of Perls doing therapy, had a guest from the Gestalt Institute. . . . The whole semester was carried out primarily through student ideas, energy and planning.

— *Faculty member, Alternate Psychology Major, San Francisco*

The "New" Math . . .

Despite taking three years of advanced math in high school, my basic background was extremely weak. When I first registered for this class, I was wary of the method of teaching, but four months later I am recommending it to my friends.

— *From a student evaluation sheet, individualized mathematics course.*

From a Tape Recording . . .

But today I would like you to think about some of the reasons why man has created art. On your study guide there is space for you to write six reasons why you think man has created art objects. But if you feel particularly productive today, and can come up with more reasons, feel free to list them too. Now turn off the recorder, make your list, and start the tape again when you have finished.

The tape will suggest a few reasons you might have written down, as well as others you have not considered. However, those discussed on the tape are by no means exhaustive. Be prepared to discuss some of the other reasons you have written down when you meet in your discussion section.

— *From Unit 1, Script for Filmstrip and Audio Tape, Art History, San Jose*

Work and More Work . . .

I felt that a great amount of time and effort had to be put into this course. For just three *lower* division units and a requirement for graduation — it was ridiculous! I I felt the method of teaching was good and the time was needed. But the standard one-hour-per-unit-a-week routine would never hold here.

— *A student evaluation of PSI mathematics course.*

A Caution . . .

It is probably most important to caution instructors who are considering developing or using individualized courses of the vast amount of instructor time which is involved. No matter how much that is stressed, it must really be experienced to be realized. Without a real belief in the superiority and efficacy of personalized instruction, many an instructor may falter and return to the easier, if less effective, teaching methods which were previsouly used.

-- *A Project Director's Final Report*

Nursing Faculty Comment on Self-learning Modules . . .

"I hope the intercampus process continues. We shouldn't be so isolated on the campuses. I think it's good to see ourselves as parts of a system."

"My students now come to the lab more prepared on the subject, so that less clinical supervision time is necessary."

"The hospital staff felt our students were better prepared. When I lecture now, I sense that the students are understanding me more. They can do the exercises and review at their own pace."

Experiencing History . . .

One 'Congregational' student wouldn't convert unless the 'Methodist' evangelist offered him some 'live units' for doing so. The Methodist reported this to me with some disgust, *after the class was over!* Both students were right in role, without instruction. And one continued in role after class. Or maybe it was not a role any more, but his experience.

-- *Faculty Journal, Experiencing History, 1740-1776, Long Beach*

Irksome Words . . .

"The words that we use in training for improvement of instruction are beginning to be irksome to some of the faculty. We are finding alternative words for things like 'performance objective,' 'validation of instruction,' 'modular development,' 'learner based criteria,' and the like."

--*Project Director's Report, Faculty Development*

How to Measure Competency -- One Recipe...

Faculty in international relations at San Francisco are seeking to develop a comprehensive bank of questions to measure student competency. With the help of the Program for Innovation, they sought to identify, through a content analysis of leading textbooks, the knowledge and skills the authors felt were essential in international relations. The task was not easy. They employed eighteen textbooks and analyzed their indices. "A critical problem surrounded the mediocre quality of definitions often found in the textbooks. Some could be described only as tautologies, while others consisted of scattered words or phrases which required considerable metaphysical prowess on the part of the student in order to figure out what the author meant by the term." The initial list included over 1,500 concepts which appeared in the texts nearly 2,500 times. A panel of consultants narrowed the original list, added some, and produced a list considered essential to a "core" or foundation level of knowledge.

II. WHAT HAVE WE LEARNED ABOUT CAMPUS, FACULTY AND STUDENT PARTICIPATION?

FOCUS: CAMPUS PARTICIPATION

Most campuses have participated in the Program to an extent roughly proportionate to their size on three scales: dollars allocated, number of projects (including renewals) and participation in inter-campus and systemwide activities. Chart 1 and Appendix B summarize relevant data. Figures do, however, disclose a range of participation. For example, Chico, a campus of medium size in the system, has received the largest number of individual grants along with the second highest dollar allocation. At the other end of the spectrum, Stanislaus, the smallest campus, has also received the smallest number of grants and similarly the smallest allocation. Long Beach received the greatest total funding from the Program, and six grants as compared to Chico's eleven. The Weekend College, funded in 1972-73, accounted for over half of the grant allocations received by Long Beach.

No campus has received more than 11% of the total funding available in the three years for its campus-based projects as indicated below:

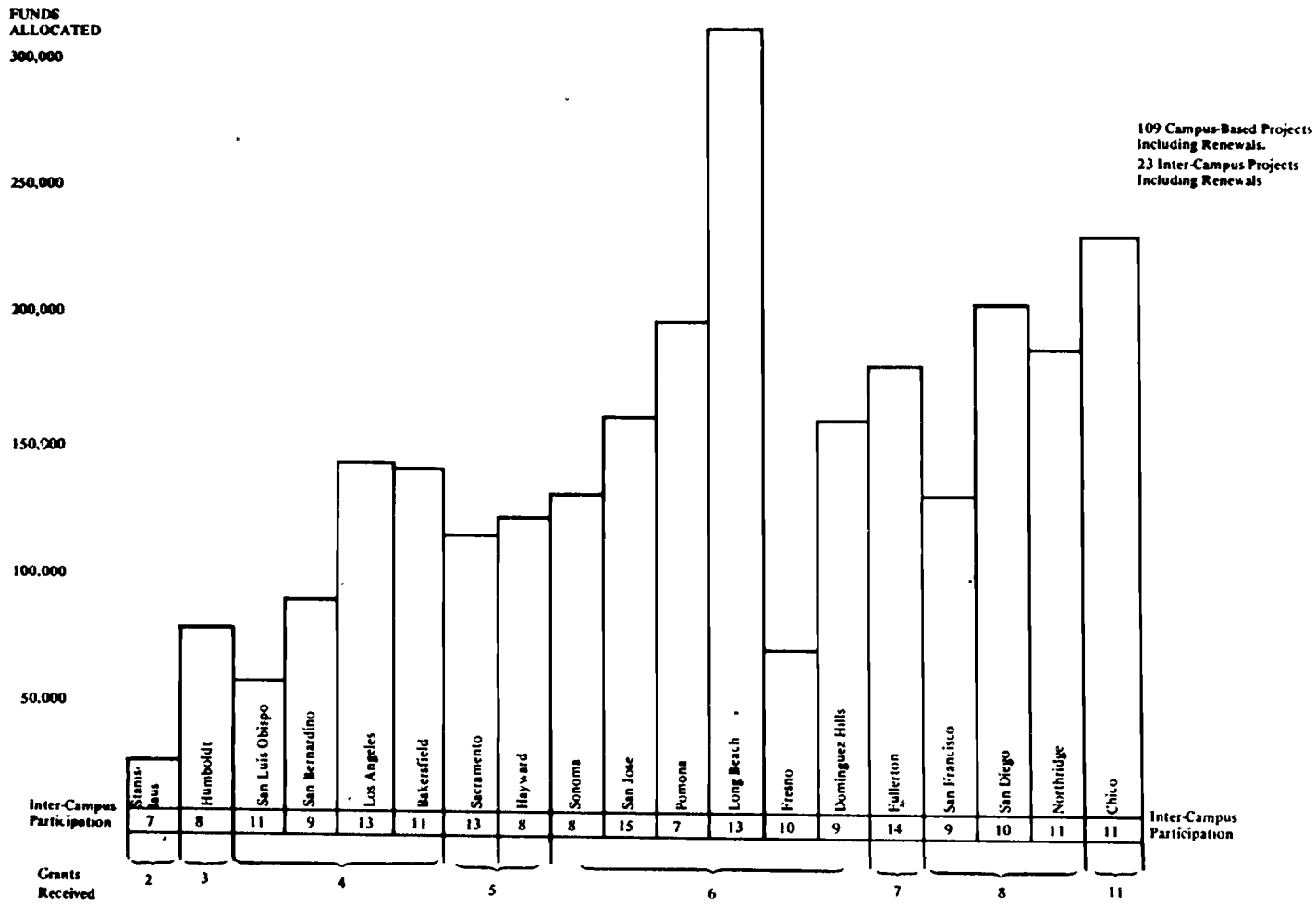
Bakersfield	5.0%	Northridge	6.9%
Chico	8.0	Pomona	7.1
Dominguez Hills	5.6	Sacramento	4.2
Fresno	2.7	San Bernardino	3.3
Fullerton	6.4	San Diego	7.3
Hayward	4.6	San Francisco	5.3
Humboldt	3.0	San Jose	6.2
Long Beach	10.7	San Luis Obispo	2.3
Los Angeles	5.2	Sonoma	5.1
		Stanislaus	1.0

The "quality" and kind of participation, as well as the number of students and faculty involved, is important. San Jose, with six individual projects funded (one of which in fact encompassed five distinct activities) has participated in nearly every system and inter-campus program possible, including participation as one of the six pilot faculty development programs associated with the federal- and state-funded Center for Professional Development. The campus serves, as well, as the center for an inter-institutional effort involving the development of lower division course materials in science for non-science majors. Similarly, Northridge manages the English Equivalency Examination, and serves as the coordinating campus for both a six-campus effort to develop programmed materials in English composition and a three-university program to expand a videotape bank in earth sciences. Ten campuses are involved in San Francisco's project to develop assessment examinations at the degree-major level in political science. Los Angeles serves as the focal point for a fourteen-campus project to develop self-learning modules in nursing. Bakersfield, through participation in the Program supplemented by federal and foundation funding, has engaged in the largest single campus-wide effort to test various approaches to self-paced learning.

Criteria for measuring participation are varied and require qualification in most instances. The measurements suggested in Chart 1, when coupled with an overview of project activities themselves and interviews with each project director and campus staff, suggest that substantial levels of

CHART 1

TOTAL DOLLARS ALLOCATED CAMPUS-BASED PROJECTS RANKED BY NUMBER OF GRANTS RECEIVED, 1972-75



participation proportionate to campus size have been achieved at Bakersfield, Chico, Northridge, Fullerton, and San Jose. In some measure, a wave effect seems to be operating: at some campuses such as Fresno and San Diego, interest in innovation, reform, and faculty development has increased markedly over the past three years. At others faculty and administrative support is only now developing. In the final analysis, projects and their impact on host campuses must be judged by their results, not by their cost or how many discrete projects were in fact mounted.

FOCUS: IMPACT OF INNOVATION ON FACULTY

Statistics relating to the total numbers of faculty participating in one manner or another in a project or activity sponsored through the Program say little about whether or not the Program has had substantial real impact on faculty throughout the system. However, interviews with nearly all current and past project directors and, in some instances, faculty associated with the project directors, disclosed satisfaction with having participated in the project in nearly all cases. In no instances did faculty indicate they were presently less interested in innovation than they were at first, even where their experiences were not entirely as expected.

A very mixed picture is presented by faculty who have served as project directors or active project participants with respect to relationships with colleagues, particularly within the retention, promotion, and tenure context. While the number of cases is not great, and all facts are not necessarily apparent, it appears that participation in an innovative project on many campuses has little effect one way or another upon tenure and promotion. There are, of course, notable exceptions. In some cases active participation in an innovation in instruction has been used to offset a limited publication or paper production effort.

On the other hand, an innovator at one of the older, larger campuses in the system may find the pressure to produce papers in his discipline to be such that he or she simply cannot afford the time to try new teaching strategies. At some of the newer campuses where there has been strong faculty and administrative interest in new approaches, there is a more supportive atmosphere. It must again be emphasized that the number of cases where promotion and tenure decisions have occurred during or since project activity is quite small. Indeed, it is significant to note that innovation is not the exclusive property of the young faculty member as the following figures show:

Rank of Project Director(s) at time of Application for Grant (1974-75 Applicants)

Professor	21%
Associate Professor	30%
Assistant Professor	31%
Lecturer & Other	4%
Administrator/Counsellor	15%

It is often asked why one faculty member is interested in innovation and not another. The evaluator for the Alternate Psychology Major at San Francisco, after interviewing six faculty in the program, wrote:

> The reasons the alternate major's professors give for deciding to teach in the program come directly out of the reasons they have for their dissatisfaction with traditional teaching: they wanted students to be able to plan a unified program growing out of their own interest; they anticipated being able to work more closely with students and colleagues; they wanted greater freedom to define their own roles and find new ways of teaching.

Dissatisfaction with traditional teaching situations appears to enter into many faculty members' decisions to attempt the new. In other instances there does not seem to be a marked dissatisfaction, but rather a belief that their instructional approaches could be improved through more variety and stimulus, both to themselves as well as their students. One project director observes. "I consider myself a good teacher, but I know that I have perhaps only a dozen truly excellent lectures in a given course – I do not have 40 or 45. Why not try some other alternatives to total dependence on lectures?"

Other faculty may find themselves part of a trend which is not of their own making and may be caught, as it were, on a wave of change. The project evaluator for the 1973-74 statewide nursing project, following intensive and repeated interviews with 16 faculty who had experimented with using self-learning modules prepared by other faculty, gained the *impression* of a process of innovation and change which varies in some measure with conventional wisdom about how change comes about.

First, he believes, the faculty noted that there was a trend toward the use of modules (the innovation) in nursing, second, the system, through the Program, seemed to be encouraging the use of modules in its projects, third, the faculty noted others interested in the innovation, fourth, the faculty member became a user and developer of modules, and, lastly, a real commitment to the innovation developed.

There is an extensive literature concerning the fostering of change within organizations such as those of higher education. One significant point gathered from research findings which is supported by CSUC Program experience is that the extent to which a faculty member or an administrator accepts new roles is closely linked to his perception of chances for gain and recognition. If the norms of the group to which he belongs are sufficiently divergent from the role he is called upon to play, either he is less likely to take on the role or be successful in it. (See, Ronald E. Hull, "A Research and Development Model," *Educational Administration Quarterly* 10 (Autumn, 1974), 33-45.)

Innovation must carry with it rewards of one sort or another. It must also be generally accepted and supported by colleagues, both faculty and administrators. Some notable successes which have occurred in terms of faculty response to innovation indicate that the overall climate within the CSUC is sufficiently supportive to encourage those who seek further innovation and change.

Faculty Development: A Reflection of Interest

One major reflection of faculty interest in innovation – hopefully in part the result of the Program's efforts – has been the increasing support for faculty development programs on CSUC campuses. Indeed, three years ago few administrators and faculty were aware of the potential of those activities which are now commonly placed under the "faculty development" or "professional development" label.

The Fund in 1972-73 supported a model program at Long Beach which became the first campus in the system to establish a Faculty Development Center. Since that time several campuses have developed programs, in some instances as part of a Learning Resources Center, designed to provide assistance to faculty in exploring new techniques of instruction, student evaluation, instructional design, better understanding of student learning problems, and improving skills in personal relations.

The evolution of these efforts has been enhanced by the establishment of a CSUC Center for Professional Development under a grant from the Federal Fund for the Improvement of Postsecondary Education (HEW). The Center is also supported through campus and system matching dollars through the Program. The Center Policy Board, composed of representatives from all

campuses of the system, selected six model campus programs from 13 proposals. Center staff will work closely with these campuses in the coming months to expand faculty and professional development activities. The Center also sponsors workshops and provides consultation services to all campuses in the system.

That thirteen campuses devoted effort to developing proposals, that six campuses selected received endorsement for their particular strategies from key faculty groups on the campus, and that continuing support has been provided by the Statewide Academic Senate is most significant in a system such as the CSUC. Without the continuance of the Program and the strong support on many campuses for change in the instructional process and environment, it is doubtful if the Center could have developed in the orderly fashion it has.

Finally, another sort of faculty development has been encouraged through the Program. In 1973-74, a project of the Statewide Academic Senate was supported through the Fund which enabled the design of a system for exchange of faculty within the system. State support for a permanent program has been included in the 1975-76 Governor's Budget as an outgrowth of this project.

A Study of Faculty Responses to Innovation: Bakersfield

The most detailed study made to date of a significant number of faculty who have participated in innovative projects (modularized courses) was conducted at Bakersfield in 1974. In this study 26 professors completed a detailed questionnaire including questions relating to use of time, attitude toward the innovation and other questions. Major findings are shown in Table 4, Table 5, and Table 6.

The data indicate that the typical professor in an experimental course spent less time in the classroom, more time in reading and critiquing exams and papers, a substantially greater number of hours with students individually out of the classroom, more time in preparation of assignments, and less time in preparation of lecture notes and discussion outlines. The professor believed that the total amount of work demanded of students was probably greater than in a traditional course and felt that the total investment of instructor time was the same, or greater than would otherwise be the case (Table 4).

Fifty-eight percent felt the "overall effectiveness of the present course in terms of learning outcomes" was greater than expected within a more traditional format, while only 15 percent indicated a loss of effectiveness in this regard (Table 5). A strong case for the innovative mode is made in terms of 1) opportunities to meet individual needs and interests of students, 2) opportunities to assist students in terms of personal growth; 3) opportunities to work with students on a one-to-one basis, and 4) maintaining a good rapport between student and instructor.

Faculty teaching an innovative course were asked whether they would "prefer teaching the course in about the same way" the next time around. In this instance, 52 percent agreed that they would, 36 percent felt they would not, while 12 percent were uncertain in this regard. Next, the question was posed whether the objectives planned for the course were fully realized. Fifty-eight percent felt that course objectives had been fully realized, 38 percent indicated they had not, while 4 percent were not sure. Finally, one of the key items in Table 6 concerns faculty members' opinions regarding the method of instruction employed in their course. The results were skewed in a positive direction as 32 percent "strongly agreed," and 28 percent "agreed" that the innovative mode was superior.(See p.48.)

TABLE 4

Distribution Of Faculty Responses
Comparing Results Obtained In
Experimental Course To Expectations
Associated With A More Conventional Format
In Respect To Instructor Input

"Compared to a more traditional teaching mode, how would you describe the results obtained in the present course relative to what you might expect in a more conventinal offering?"	– Scale of Responses – 1	2	3	4	5
	much less		about same		much greater
"Hours spent in the classroom":	42%	31%	19%	4%	4%
"Reading and criticizing exams, papers, or other student products":	0	15	19	31	35
"Time spent with colleagues, committees, etc., directly related to operation of this course":	15	10	43	21	20
"Hours spent with students individually out of class":	4	8	27	19	42
"Hours spent with groups of students outside of class":	8	19	47	16	10
"Preparation of assignments – reading lists, instructions for written reports, projects, field work, etc., was probably":	15	8	19	27	31
"Preparation of lecture notes, discussion outlines, etc., for your own use":	27	19	42	4	8
"Preparation of exams or other measures of evaluating students' work":	23	12	32	25	8
"Difficulties in presenting the materials in the instructional units thoroughly":	12	16	40	20	12
"Total amount of work demanded of the students was probably":	4	15	23	50	8
"The total investment of instructor time for all activities related to this course was":	8	8	34	23	27
"The total effort required of the instructor was probably":	8	8	35	15	34

TABLE 5

Distribution of Faculty Responses Comparing
Overall Results Obtained In Experimental Courses
To Expectations Associated With A More Conventional Format

"Compared to a more traditional teaching mode, how would you describe the results obtained in the present course relative to what you might expect in a more conventional offering?"	– Scale of Responses –				
	1 much less	2	3 about same	4	5 much greater
"The overall effectiveness of the present course in terms of learning outcomes was":	0%	15%	27%	39%	19%
"The number of opportunities to meet the individual needs and interests of students was probably":	0	4	15	23	58
"Opportunities to assist students in terms of personal growth":	4	0	8	19	69
"Opportunities to work with students on a one-to-one basis":	4	0	11	54	31
"Maintenance of a good rapport between student and instructor was probably":	0	8	15	54	23

Impact of Projects on Faculty

Another perspective from which to assess the Program's impact on faculty and campus is the extent to which a given project or project director has encouraged, through example and by advice, other faculty to attempt innovation on their own. Many of the 1974-75 campus-awarded mini-grants described below can be ascribed to this kind of spin-off.

In interviews with present and past project directors, particular attention was paid to whether or not the project director could identify one or more faculty who, from his or her perspective, had been influenced by the original project activity. From interviews with project directors where spin-off was feasible, it is possible to identify such firm spin-off in 45 of 60 cases, or 75%.

Several examples may be cited to typify the range of spin-off. The General Education Science curriculum project at Humboldt, which involved several faculty, has provided assistance to other non-project faculty engaged in modularizing a mathematics course and an economics course. In addition, the project is providing data to the Director of Institutional Research as a basis for assessing whether the objectives of the campus' general educational requirements are being met. A comprehensive examination program in lower division science is also under development, a partial result of the project.

A P.S.I. course in business finance has encouraged faculty to develop similar courses in quantitative methods and marketing on the Fullerton campus. A learning unit bank for communications courses at San Jose, first developed for use by four faculty, is now being used, and contributed to, by ten faculty while another five make occasional use of it. The art history project at San Jose, originally viewed with some hesitancy by other members of the department, has to date encouraged four art faculty to develop mediated materials for their own courses or make use of the materials developed for the project.

At Stanislaus, a speech pathology course developed on a P.S.I. format, now in its second year of offering, has helped to encourage the campus department to move toward a modified competency-based program. Interest in P.S.I. on campus is now such that a workshop is planned for February 1975. The efforts of two faculty at Sonoma, who worked first upon computer modules in social science methods and more recently on competency-based materials in American government, have encouraged development of P.S.I. courses on the campus in German and exercise physiology. The televised fundamentals of art project at Chico has been followed by a campus-supported beginning printmaking course using video to be offered in spring 1975. A small faculty development grant from the Program to the School of Business at Chico contributed to the decision by the accounting department to offer six to eight sections each term on a P.S.I. basis.

TABLE 6

Distribution of Faculty Responses Structure And Outcomes of Innovative Course

	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
"Though I have guided the students and acted as a resource person, I felt more a member of the group than an authority figure."	11%	23%	23%	31%	12%
"In terms of the format that was applied, this course was relatively unstructured."	23	19	8	23	27
"I would prefer teaching this course in about the same way as I did during [this] quarter."	24	28	12	24	12
"I would say that the objectives planned for this course were fully realized."	8	50	4	38	0
"The method of instruction employed in this course is superior to the traditional mode of instruction."	32	28	24	16	0

A project to provide experimentation with the Learning Through Discussion method (LTD) at Pomona has led 18 faculty to use the instructional technique in their course sections. The method is a controlled discussion strategy which can be adapted to large classes.

The impact of innovation and change can be visualized. For example, associate dean, Robert Picker, of the San Francisco School of Behavioral and Social Sciences project, developed what he terms a "crude scale for measuring the impact of innovation." On this scale of seven points the highest, the first order change, is the stage when the experiment or innovation is fully implemented and faculty and administrators are involved who were not part of the original experiment. His scale is as follows.

SCALE FOR MEASURING INNOVATION IMPACT

1st Order Change
Experiment/innovation approved and implemented by the University as a regularly offered program or a permanent organizational change. Faculty/administrators involved are not persons associated with original experiment. Continued for more than one semester.

2nd Order Change
Experiment/innovation approved and implemented by the University as a regularly offered program or a permanent organizational change. Faculty/administrators involved are the persons responsible for original experiment. Minimum of one semester.

3rd Order Change
Variant of an experiment/innovation approved and implemented by the University as a regularly offered program or a permanent organizational change. Minimum of one semester.

4th Order Change
Experiment/innovation is utilized as basis for proposals for additional change and development.

5th Order Change
Experiment/innovation formulated and introduced as part of instruction/administration.

6th Order Change
Initiate discussions covering planning/development of experimentation/innovation.

7th Order Change
Program Review.

COMMENT: IMPACT OF INNOVATION ON FACULTY

There are many positive indicators which suggest that the Program has had significant impact upon faculty. Continued interest in projects, growing awareness of faculty development, and identifiable spin-off from projects among other faculty are some favorable signs.

A fundamental and complex problem remains, namely the providing of incentives for change. Promotion practices, workload demands, and academic reward systems do not usually favor the instructor seeking to improve techniques of teaching or to improve skills in working with students. Through special project support, the Program has enabled faculty to pursue some efforts toward innovation in instruction, but it cannot, in itself, build in incentives which are required for assuring continuing change on campus.

Most certainly a large number of faculty within the system today are more knowledgeable than they were about many kinds of instructional approaches and teaching techniques. Program activities have served to highlight for faculty the need for, and potential of, campus instructional support services in media, instructional design, and applications of the computer. Increasing demands on these services attest to faculty becoming more familiar and comfortable with educational technology and all that it entails.

FOCUS: STUDENT REACTION TO INNOVATION

Throughout the foregoing there have been references to student reactions to innovation in terms of their responses either to availability of options such as credit by examination or to an innovative course or program. The majority of these reactions are favorable and often enthusiastic.

The most detailed investigation of student reactions and attitudes has been conducted at Bakersfield. Using a combination of questionnaires and interviews, the characteristics and attitudes toward the learning situation were compared between students registered in experimental (modularized, self-paced) courses and those in courses taught in the traditional manner. Sixteen experimental classes and 24 conventional courses were surveyed in spring 1974 with a total of 396 students including 158 students in the experimental courses. This latter figure represents 60% of all enrollments in such courses during the term.

The survey found that female students were more likely to be in experimental courses. It also disclosed that the women students in both kinds of courses were more favorably inclined toward frequent tests, unstructured classes, and memorization of facts in preparation for exams, while males were more likely to express preference for independent study, doing a research project, and being called on in class.

Considering the effect of the college experience, certain significant differences were found between students in experimental courses and in the conventional or "control" classes. More students in the experimental group felt "they were able to use their creative abilities a lot better," as a result of the college experience than in the control classes. Eighty-six percent of the experimental group indicated that their "intellectual curiosity is now more genuine" as contrasted with 74% of the control group students. These and other comparisons are presented in Table 7.

The control students and those in experimental courses exhibited many similarities. Among them was a similarity of views concerning their self-reported progress in the course. The large majority of both groups enjoyed the particular course, experimental or traditional, in which they were registered. 79%

TABLE 7

Distribution of Responses Relating to Effects
Of Students' College Experience:
Bakersfield Survey

Differential Effects of College Experience:	Experimental		Control	
	Agree	Disagree	Agree	Disagree
"More intellectual stimulation than expected"	68%	32%	58%	42%[a]
"Learned to think more independently"	84	16	79	21
"Able to use creative abilities a lot better"	77	23	61	39*
"Have a better understanding of others"	87	13	80	20
"Intellectual curiosity is now more genuine"	86	14	74	26*
"Able to give more of myself"	74	26	67	33
"More well-rounded intellectual and feel I am a more complete human being"	82	18	74	26

*Statistically significant at the .05 level or below, a - approaches significance.

in the experimental and 84% in the control (differences not significant). The experimental group students did, however, have higher grade expectations (83%) in contrast to the control students (72%) and were more likely to believe the class size "just about right." Both groups viewed their course, its methods and objectives favorably and in a remarkably similar manner as shown in Table 8.

The Bakersfield data, which include a variety of analyses not summarized herein, suggest that there exists a favorable attitude toward innovation on the part of the student, but, at the same time, student perspectives of traditional courses are also favorable. This survey, as well as data developed in the context of other projects, suggests that certain characteristics and preferences lead students into particular innovations. For example, the Bakersfield data show that the student who indicates a preference for independent study will view the experimental course more favorably than the student who does not hold such a preference. Similarly, students who do not care for lectures find the experimental mode a superior teaching method. The more compliant the student, the less likely he or she is to favor the innovative course.

TABLE 8

Distribution of Student Responses Regarding Evaluation of Courses: Bakersfield Survey

Assessment Items:	Experimental		Control	
	Agree	Disagree	Agree	Disagree
"Content of course useful to career goals"	85%	15%	75%	25%
"Course useful to personal/social growth"	84	16	77	23
"Method of instruction is a superior one"	69	31	69	31
"Focus of course on following and comprehending knowledge rather than on problem solving"	65	35	67	33
"In terms of meeting important objectives, course was average or better"	28	72	33	67
"Objectives of course were specific and clear"	88	12	81	19
"Instructor provided adequate feedback"	81	19	76	24
"Instructor more a member of the group than an authority figure"	61	39	64	36

Student evaluation may be a reflection of the demands placed upon them. A project using a P.S.I. – mastery learning strategy in a mechanical engineering (statics) course at San Luis Obispo indicated strong student support among those students who were able to complete the work. The Project Director, however, draws some significant conclusions in describing the situation faced by students and faculty in using this strategy. He writes:

- The requirement of mastery (75-80% level) placed the students in a position which they had never really faced before, namely, being held accountable for demonstrated understanding of subject matter material. Many of the students were unable to cope with the demands of "knowing" rather than "memorizing."

- The repeated difficulties encountered by many of the students brought to light dramatically their unpreparedness, especially in the areas of mathematics, graphical representation, and effective study habits.

- The specific demands of the course further emphasized the . . . breadth of . . . abilities and readiness to learn.

- Although student reactions were mixed on some questions, their overall reactions were negative Their unpreparedness to meet the level of performance expected for the course (locally and nationally) resulted in their being frustrated and in spending far too much time on the course. Some of the C students observed that they would have received a B or and A for the same amount of work in a conventionally taught course.

- It is quite apparent that many students have passed prerequisite courses (principally mathematics) without being held accountable for demonstrating a reasonable understanding of the basic concepts and procedures.

- Although the specific subject matter demands were wholly in line with normal standards of course content and course expectations both locally and nationally, the requirement of demonstrated mastery was overall so severe that the requirements in the experiment will be relaxed and modified beginning with the winter 1975 quarter. Without academic "companionship" with other courses where similar requirements are established, too great a burden is placed on the one course.

The above reactions are related to modularized courses. Another set of reactions was obtained regarding mini-courses originally offered on the Fullerton campus under a grant from the Program, and now being continued within campus resources. A 1973 survey indicated that the majority of students enrolled in a mini-course for one unit because they like the concentrated study of subject matter, the scheduling flexibility, and the subject matter as it contrasted with the usual general education offerings. In comparisons between the mini-course and other general education courses, a clear majority indicated that the mini-course was better than other general education courses. "The mini-course format is generally better than the usual education courses." The overwhelming majority also found the concept a good one: "As an educational concept, mini-courses are a good idea."

In another context, student endorsement of one project has occurred through a financial contribution of the Fullerton Associated Student Body to the Center for Community Internships and Cooperative Education. This Center was begun under Program support and has served to consolidate and develop off-campus internships and other learning work experiences for the Fullerton campus. In fall 1974, 825 students were being served through 24 department and school programs. Thirty-one faculty are presently involved A student testimonial perhaps best serves to indicate a response to this program:

> The internship helps you discover that you can do the things the University teaches. There are pressures on campus, and there are expectations on the job. Learning comes slowly on the job, but it stays with you. It is a good way to ease into a job, and I secured full-time employment starting immediately upon my graduation.

The ninety employers participating in the program in 1974 include. Bowers Museum (art and anthropology); Rockwell International (art), U.S. Forest Service (biology), Internal Revenue Service (business); *Los Angeles Times* (communications), Community Treatment Center (criminal justice); Youth Guidance Center (ethnic studies); and the Federal Records Center (history).

The student sometimes finds himself within a learning situation wholly different from that previously experienced. At San Luis Obispo a project conducted by a professor of chemistry has applied what is called the Braithewaite Taxonomy of Unity, derived from Bertrand Russell's concept of wholeness in mathematics. This educational strategy challenges the students to gain directed mind-improving experiences by practicing problem solving. If an individual can ask the correct questions concerning a problem, then the potential solution to that problem also lies within the mind of that individual. In this method, the instructor does not read the text to the students, nor does he do examples of each type of problem assigned. By lectures and other course materials, he leads the student to the understanding needed to perform the routine course assignment. A faculty observer of the project writes:

> If a teaching method such as described above is skillfully employed, the results observable by an outsider . . . are striking. The classroom becomes a meeting place for ideas. The instructor is no longer an alternative to studying, or an oracle of slick problem-solving devices. He is the organizer in the student's quest for understanding and knowledge.

For such a course, student evaluations are somewhat different than the typical. For example, 40% of the students were most strongly influenced in the selection of the course by the appeal of the course instructor, followed by recommendation of friends or another instructor. The course resulted in a positive, though modest, shift in attitude toward chemistry. Surveys, when correlated with grades, showed that under the methodology the student who completed his homework assignments was virtually assured to top grades. Students have indicated that they have learned more than chemistry in the process, as evidenced by a number of special projects voluntarily submitted. Attrition in the course was low during the spring quarter of 80 enrollees only six withdrew, despite the fact that there ultimately were 8 D's and 3 F's.

COMMENT: STUDENT REACTION TO INNOVATION

No simply stated conclusions are appropriate. One cannot say that *all* students favor non-traditional and innovative approaches to their instruction. Many clearly prefer the conventional lecture even when exposed to other approaches. Similarly, it can not be stated, even by implication, that large groups of students clearly favor any one, single, alternative approach to education, and certainly not for their total program.

If a possible generalization is to be made, it is that, for the most part, students are quite willing to attempt the experimental, perhaps to bring variety and flexibility to their education. This desire for flexibility is borne out by findings of an "Ideal Course Survey" conducted at San Francisco as a part of the School of Behavioral and Social Sciences activities. From this survey of one group of students, a composite picture emerges:

> Degree Program. A flexible program in which options enable a student to complete a degree ranging from two to four years.
>
> Course. A flexible schedule and unit assignments with pace to be determined by the class as a whole.
>
> Model of Instruction. A class of not more than twenty students in which combinations of instructional activities take place. Of these, classroom discussion is the most desired activity.

Instructional Characteristics: Ideal course is one in which student instruction is emphasized. Professor should be open and responsive to students.

Conclusions such as these suggest that how, when, and in what manner students wish to learn are questions which *all* programs should periodically consider. The system, campuses, and faculty may well find there is a need for increased flexibility in their approaches to program offerings, be they "innovative" or not.

FOCUS: DISSEMINATION STRATEGIES – INTER-CAMPUS PROJECTS

Dissemination of project results in innovation and change is difficult to accomplish unless the environment provides the faculty with an opportunity to become involved. A strategy of encouraging inter-campus projects involving several faculty is being followed. This deliberate extension of innovation may be unique in contemporary higher education as most innovation lives (and often dies) in the desert of its host campus.

Inter-campus and system activities in most instances build upon individual pilot projects funded in the first two years of the program. For example, an enthusiastic response from special education faculty systemwide led to an extension for 1974-75 of the San Jose University-based project which has produced videotapes for special education core courses. As noted, the Fund currently is supporting duplication of these tapes for use by some 2,000 students throughout the system. Continuation of the project is projected for 1975-76 with campuses producing additional materials on a joint basis.

Similarly, in 1973-74, a CSU, Northridge, project resulted in the completion of programmed learning materials for freshman English composition. Following pilot testing on that campus and external evaluation, the 1974-75 Program is supporting a six-campus project involving the testing of materials on other campuses as well as the joint revision of some units found to be inadequate in the pilot test stage. What began then as a single campus department project has been extended sixfold. 1975-76 could well see the continued extension of this innovative grant program to other campuses in the system.

Multi-campus projects underway in 1974-75 include:

Discipline	Campuses	Innovations
*Nursing	14	Mediated, modularized courses; self-pacing
Business	5	Standardized examinations, norming and experimentation. Purpose: credit by examination.
*English	6	Programmed learning; self-pacing
Interdisciplinary Science Course for Non-Science Majors	3	Mediated, modularized, system-oriented course materials

Discipline	Campuses	Innovations
*Earth Sciences	3	Self-paced, videotaped materials
*Political Science	10	Development of assessment examinations at the degree major level
*Special Education	12-16	Dissemination of videotape materials
English	Systemwide	English Equivalency Examination
Interdisciplinary	Systemwide	Computerized test item data bank, science, history, math, accounting and chemistry (SOCRATES)
Faculty Development	6	Testing of models for training faculty to use new techniques (combination with Federal grant program)

*Developed from single-campus project

It is anticipated that the majority of multi-campus activities designed to extend and embed innovation will continue to stem from single-campus projects funded in the first three years of the program. However, it is also planned to select other disciplines in which to launch inter-campus projects which may not have been previously included in the Program for Innovation. The lower division science course project listed above is one such project begun in 1974-75.

FOCUS: DISSEMINATION STRATEGIES – MINI-GRANTS

The program has emphasized a strategy of funding faculty in pilot efforts on a statewide basis to test educational and instructional strategies. Obviously not all faculty can be funded at the same level to accomplish much the same objectives as another. However, some funds may be particularly useful in assisting a faculty member to adapt the product, process or findings of another to his own courses. Consequently, a new dimension – mini-grants – was added to the Program in 1974-75.

Block grants were provided each campus, the amount varying from $7,500 to $15,000 according to campus size. No single grant could exceed $2,500. (Projects of larger scope were submitted to the systemwide competition.) Often, however, the mini-grant requested was far less. One of the smallest was a $100 grant for development of teacher training methods in environmental education at Fullerton. It is apparent that only a small financial investment is needed for some faculty to launch their innovative experiments.

Within broad general guidelines individual campuses set their own review procedures. The search "machinery" differed from campus to campus but faculty and students were usually a part of the review process. Specific requirements were stipulated by several campuses. Some, for example, especially the campuses with the smallest block of funds, decided not to provide the project director with assigned time. The fact that many faculty are prepared to develop an innovative project,

whatever its scope, on non-reimbursed time suggests a high degree of interest in moving in new directions.

Other campuses concentrated on a particular area of innovation. An example is San Luis Obispo, where the campus called for project proposals which would relate to the activities of the career resources center. San Francisco and Sacramento funded individual mini-projects with a career education focus. Pomona applicants filed letters of intent, which were first reviewed by a working committee. Successful faculty were then asked to develop proposals. An overview of funded projects shows that the mini-grants are fairly evenly distributed between the three broad areas of general education.

Following are some examples of the more than 145 funded mini-projects. Titles and directors are listed in Appendix G.

At Fresno a political science faculty member has organized workshops for senior citizens at two local retirement centers off campus to determine both the extent and variety of interest in social science courses among this population of potential students. Information is also being sought from more than 300 regularly enrolled students at Fresno who are over the age of 55.

Initially, San Diego funded 11 projects from a total of 24 submitted. These range from a seminar for native American language teachers to a program in general biology. In its second phase of the mini-grant program, the San Diego review board, the Teaching and Learning Council, is encouraging the submission of proposals from student organizations.

San Bernardino music majors will participate in a Band for all Seasons in which students will gain in-depth experience ranging from a sixteenth century Stadtpfeifer band to a twentieth century Aleatori ensemble.

At Fullerton funds were provided for developing a project for training instructional aides in the bilingual/bicultural teaching of mathematics.

Out of a total of 26 submitted, San Jose funded eight projects including a self-paced course in stagecraft; validation of a course utilizing the concepts of computer stimulation in business management; and learning modules in contemporary history and art.

A number of proposals were concerned with the need for better advising and counseling assistance to students. Others stressed faculty development workshops and seminars, some with specific disciplinary focus. At Stanislaus, a central resource center will be established to provide assistance to faculty on self-paced and individualized instruction methods.

Other projects employ films and other audio visual aids. Students in a Northridge history course contrast historical reality with movie myths as depicted in some of Hollywood's classic films. The course has proved so popular that some sessions had to be moved to an off-campus auditorium.

COMMENT: MINI-GRANT PROGRAM

The mini-grant program has widened the circle of active innovators. There is already an important "ripple effect" reported by the campus coordinators. Paradoxically in terms of their size, mini-grants may well prove to have great impetus for encouraging faculty to explore new methods. The mini-grants have also tended to stimulate matching resources. The dollar spent in the mini-grant program often has meant another dollar spent from elsewhere in the instructional budget.

Preliminary evaluation indicates that the mini-grant program has met expectations and should be continued. On some campuses it has created an interest among faculty far beyond the very modest funds available. It has had the further benefit of enhancing the role of the Campus Coordinator for Innovation as well as encouraging the organization of representative campus committees dedicated to the encouragement of innovation.

FOCUS: DISSEMINATION STRATEGIES – WORKSHOPS, PUBLICATIONS, CLEARINGHOUSE

Workshops and publications have been, and continue to be, a primary vehicle to disseminate information about projects within the system as well as developments in other programs. *Future Talk*, a newsletter sent to all 16,000 faculty, has provided information about each project and features articles on a variety of topics: faculty development, credit by evaluation and independent study. In addition, a monograph and an occasional paper series have been launched in the past year. Monographs are available on the English Equivalency Examination, *Comparison and Contrast*, a project on the relationship of learning to the complexity of the instructional "message," *Instructional Efficiency Through Message Design;* San Jose's Audio-Tutorial Course in Art History; on the mathematical-physics project at Northridge, the high school-college interface experiment, *Project Overlay*, and the report of the project on special education *Development of a Media Oriented Core in Special Education*. An occasional paper is available on Self-Paced Learning, and a paper on evaluation is projected.

Throughout the Program, workshops have been held focusing on the program as a whole and/or special innovative strategies. Notable among these meetings has been a systemwide Workshop on Creative Change which brought experts from around the country to meet with key system faculty and academic administrators. In 1973 a major conference on the Meaning of the Baccalaureate was also sponsored through the Program and its central staff.

Other workshops have focused on organizational development, the personalized systems of instruction, faculty development, computer applications in many disciplines, and on the role of the campus coordinator for innovation. In the coming months, much workshop activity will be conducted in association with the Center for Professional Development.

The staff for the Program visited each of the more than 100 projects at least twice during the past three years. They established and maintained contact with project directors and other personnel and provided continuing assistance in the development of new procedures and policies to deal with the problems which inevitably arise when innovations are developed within the traditional framework. In several cases, the staff has cooperated with faculty in the development of inter-campus proposals and has continued to monitor these efforts during their implementation stage. This mutually beneficial interaction has led to an expansion of the staff's role as a central contact for faculty who are interested in knowing how others are dealing with common problems, or identifying persons with expertise in specific instructional strategies. This clearinghouse function is being expanded in the current year.

III. CONCLUSIONS AND CHANGING DIRECTIONS

In such an overview it is not possible to fully evaluate each project, each learning strategy or the program as a whole. No evaluation is ever complete. We have found from experience that a project which at times seems close to failure, can have the greatest impact in terms of positively influencing faculty and administration attitudes toward the innovation over a period of time. Conversely, the "successful" effort of one year, for one reason or another, may not survive the test of time. The great majority of Program supported projects, however, were proved to be of sufficient curricular worth for continuing support by the campus when the external funding ended. The fact that over 85% of the projects funded in the first two years are being continued within campus resources *does* attest to a significant success.

One can never be certain what would have been the case had there not been a Program. There is, however, more than sufficient evidence to show that the funds invested in the Program have had a significant impact upon faculty, campuses and students. This document has sought to describe the impact. In 1974-75, the funds available for innovative projects, campus and inter-campus, amounted to about three-tenths of one percent of the total system appropriation and represented only somewhat more than $6 per F.T.E. student and roughly $112 per full time equivalent faculty member. There are, of course, alternative ways in which these funds could have been (or could be) spent. The Program, however, does seem a most fruitful and direct way to encourage faculty to experiment with new approaches to instruction. In this regard it should be viewed in a different category from very necessary programs such as sabbaticals, creative leaves and exchanges, which assure a dynamic faculty.

The Program, its activities and results must be assessed within the context of a large and complex system operating within a larger system of state government. Many of the projects have encountered procedural and policy issues with which neither they nor, for that matter, the system coordinating office can be expected to deal. Indeed, project results are often obscured because of reporting mechanisms established to meet the needs of the total system. (A case in point is one project, since terminated, which could not identify students who received credit for the work completed as a part of the project because campus reporting procedures called for student credit hours to be merged with those of conventional classes.) The system of reporting faculty workload, utilization of facilities, and other data concerning students remains closely linked to traditional classes taught in the traditional manner. These problems are apparent to many beyond the projects themselves, but the changes in reporting systems which are required for effective system management and accountability are not developed and adopted overnight. *The Program, however, has brought about a general awareness that non-traditional instructional and learning methods require some non-traditional approaches to record keeping.*

With these concerns noted, the following is a summary of the conclusions about the instructional strategies tested in the program, faculty and student responses, and the overall Program itself. These conclusions necessarily are tentative and will be changed in some degree with time. Conclusions made a year ago based on preliminary experience have led to some modifications in the Program during the current year and to further planned changes in 1975-76.

A SUMMARY OF CONCLUSIONS

The Value of the Individual Innovation

Project evidence suggest that each instructional strategy tested has some educational value depending upon discipline, student characteristics, faculty experience, and campus environment. Some projects have encountered difficulties, but most often these seem to be due to project director inexperience, lack of support from colleagues, limited campus experience in supporting innovative projects, changing campus academic requirements which affect the individual course(s) involved rather than project content, or inadequate numbers of students in the subject area to support the *option* of an experimental program alongside the traditional.

Credit by evaluation through externally prepared tests continues to show promise for providing an option to students on a modest cost basis. On-campus credit-by-examination projects raise questions about student interest and long-term cost. A better system of incentives to faculty to offer the option is much needed. **Independent study** covering blocs of a student's program are desirable for selected kinds of students and can be cost effective once development has been completed.

Experience with **comprehensive/core examinations** at the degree-major level has shown the need for continued experimentation. Faculty interest has been slow to develop in part because of the complexity of the task. Models designed to accommodate a variety of student emphases within their major program require a sophisticated approach to the identification of skills and competencies expected of graduates.

Many of the projects funded have included elements of **self-paced modularized instruction**. Most have demonstrated substantial educational value in terms of the quality of student learning and the flexibility this method provides for both students and faculty. Student motivation, however, continues to be a major problem. The more internal deadlines in the program of self-pacing, the more likely the student is to complete his work on time or earlier. These deadlines, however, vitiate some of the intent of such programs. As a general rule, programs emphasizing self-pacing show every indication of being easily built into the regular program, assuming student enrollments are sufficient to maintain appropriate student-faculty ratios and necessary assistantships and other support are available. The extension of self-pacing and other innovations, however, may require additional outlays to permit planning and start-up. While some campus funds may be available to accomplish this, there is a continued need for special developmental funding through system and campus budgets, such as the mini-grant program, and/or a flexibility in the methods of determining faculty workload for these programs and for other non-traditional methods of instruction.

Projects encompassing new **modes of instruction**, such as peer instruction and new applications of instructional television and audio-tutorial, are educationally desirable in that they greatly enhance student learning experiences. Marked increases in learning due *exclusively* to new modes of instruction, however, are not to be expected. Project data suggest that substantial investment in instructional television course programs should be made only when television provides a new dimension to instruction not otherwise possible and/or creates program flexibility such as in projects using the video-cassette. Inter-campus efforts at developing mediated courses, rather than single-campus projects, appear to show greater promise in justifying the substantial development costs required.

Campus-based **faculty development** programs have been tested and there is an indication both of their worth and the potential for substantial positive faculty response. These programs should be extended

through normal budgetary channels as soon as it is feasible to do so. In the meantime, the CSUC Center for Professional Development is experimenting with several models and approaches.

Continued long-term evaluation is required to determine the worth of time-shortened degree programs. The experiment at Dominguez Hills is a major test of the reorganized curriculum approach designed to permit degree completion within three academic years. Other approaches may lead to students completing degree work somewhat earlier. Evidence to date indicates that, for some students, a time-shortened degree program can be a sound educational reform. At this point, however, self-pacing in combination with credit by examination and advanced placement provides the most generally available opportunity for students to accelerate their collegiate work. Finally, evidence suggests that a relatively small proportion of students may take full advantage of time-shortened degree opportunities.

Student response to innovation in most instances has been good. The most enthusiastic interest seems to have been expressed in projects where there is close faculty-student group identity, even if the student's learning takes place primarily through independent, individual projects. Others benefit from alternatives to the classroom situation and would not have studied the subject had the option not been available. Students have shown themselves willing to try new approaches and to take advantage of the opportunity to add flexibility to their programs. This does not mean, however, that there is an apparent, across-the-board disenchantment with traditional coursework.

Faculty response to innovations is significant as exhibited through their interest in the Program and its newly established mini-grant component. Morever, there is an increasing awareness of the need for faculty development programs, and a willingness to participate in various kinds of learning activities about new instructional strategies. Other faculty have been influenced by colleagues who have received Program grants and are experimenting on their own. However, the reward structure on some campuses still does not fully recognize those faculty who seek to try the new approaches in their instruction and classrooms.

Development of data on the costs and benefits of innovation continues to be difficult. Project results suggest that most instructional approaches can be cost-beneficial in certain contexts, but not in others. Use of television, for example, can be cost-ineffective if the course produced is used by only one professor for a modest number of students a large student audience plus many faculty making use of the material is required to warrant the high development cost. A P.S.I. course which makes use of student proctors and tutors, on the other hand, can be quite cost-effective if the size of the course is not held to an arbitrary limit, as is often the case with conventional sections taught by the single professor. Faculty workload guidelines at time confuse the efficient operation of different types of innovation. In most cases a project has been considered cost-effective if it can be continued by the campus within regular resources. This "no greater cost" proposition, when coupled with increasing options accorded the student, leads to a cost-beneficial project. (Some projects are demonstrably cost-effective: the English Equivalency Examination, certain P.S.I. courses, savings in facilities through open-laboratories, etc.) Finally, the cost-benefit equation must take into account the extent to which the Program as whole, and individual projects in themselves, have served to enhance the vitality of the academic program.

New uses of student and faculty time have resulted from some project learning strategies. For the student, the bulk of innovative activities requires more independent work with its attendant demands for self-discipline. More opportunity exists for individual faculty-student consultation, though many students do not appear to take advantage of this opportunity. The faculty member engaged in an innovative activity spends substantial time reviewing and reorganizing curriculum. He or she also

performs a number of administrative tasks. The time spent in evaluation of student performances and work produced is substantial, as is student consultation time. Conversely, classroom lecture or laboratory demonstration time is less.

Almost without exception each approach to innovation requires review and adaptation of curricula. In most instances this process has been extensive, especially in self-pacing and other projects which involve a redesign of curricula on a behavioral objective basis. Probably the curricular impact is one of the most significant outcomes of innovations.

Extending innovation in the broadest sense is the most important task facing the Program. Essentially this involves the extension of a *process*, not a product. Project results and efforts to extend their impact by directors, as well as system staff, have led to the conclusion that the most efficient method of extending innovations is through the widest possible involvement of faculty in designing materials, testing them in their courses and, in turn, working with other faculty. Professional staff at the system and campus level must have as a part of their assignment responsibilities to facilitate this kind of effort. This conclusion has led to particular emphasis of the Program in recent months upon inter-campus projects, in several instances based upon efforts funded originally on a single campus. The Office of the Chancellor is also permanently assigning staffing to the function of monitoring and encouraging a variety of programs for change.

CHANGING DIRECTIONS

The process of innovation and change within The California State University and Colleges should be continuous. Efforts to improve the program of instruction are essential if the system is to remain responsive to the public and its students. During the last three years, the Program for Innovation has provided a systemwide focus and special support for faculty, staff and students to experiment and to apply the results of those experiments to the total college program.

The principle of investment in research and development in the instructional process has been recognized through the Program. Increased faculty interest in curricular revitalization, positive student responses, and expanding options have been the results. These results, we believe, have demonstrated the value in the years of ahead for some investment in experimentation. Special support, reallocation of resources, and the setting of new priorities at both the campus and systemwide levels will enable this investment to continue. As a part of their assignments professional staff at all levels must take on responsibilities for serving as catalysts for change.

The Program has served to highlight the need for organizational and program changes in the system, as well as testing alternative instructional and learning strategies. Among these changes has been learning assistance programs for students who lack one or more of the basic skills necessary to successfully complete a college education. The Program has also demonstrated that faculty development is an important aspect of institutional and system responsibilities. In addition, the Program has contributed to recognition of the need for more effective campus-based media and instructional development support organizations, and steps are now being taken by campuses and the system as a whole to meet these needs. These steps require adjusting campus and system priorities and reassignment of campus staff, as well as special funding recognition.

Moreover, the agenda for the Program for Innovation should be a changing one. Three years of open competition for experimental pilot projects has provided the basis for new directions. In the coming year, primary emphasis will be placed upon inter-campus projects designed to involve substantial

numbers of faculty in the process of innovation. The small grant program will be continued to enhance campus research and development capacities and to provide faculty with modest funding to take full advantage of the results and products of previous experimental projects. A primary task of those within the Program must be to develop permanent methods through which support, stimulus, and administrative recognition can be provided for faculty attempting the new.

Of particular importance in the months ahead is the need to closely examine, in cooperation with campus and system staff, those procedures which tend to hamper the continuation and expansion of those methods of instruction which are not solely dependent upon the traditional classroom and laboratory. As pilot projects have moved into stages of permanent installation, problem areas have been identified regarding workload assignment, space utilization considerations and other accounting and record-keeping matters.

The Program has been, and will continue to be, *objective generating* as it move forward. It has had multiple foci and few predetermined notions about which learning strategies or new programs should be encouraged, and which not. Its limits have been basically of two kinds. First, special support has not been provided for projects to review curricula unless, as a part of that review, new approaches to instruction are included. Second, projects involving substantially increased costs have not been encouraged unless it is clear at the outset that these costs could result in corresponding or greater increases in the effectiveness and quality of the educational process. Operating within these two broad guidelines the Program has demonstrated that a coordinated and significant effort for creative change *can* be carried out within a system of higher education.

APPENDICES

APPENDIX A

PROGRAM OBJECTIVES AND IMPLEMENTATION

Goals and objectives are modified as situations change. The national higher education environment and that of The California State University and Colleges system today is significantly different from the time of the Program's conception. In late 1970, the system was faced on the one hand with pressing fiscal problems, and on the other with the need to encourage a dynamic and vital undergraduate instructional climate in response to the student unrest of the 1960's. During the 1960's faculty throughout higher education tended to look beyond campus boundaries for professional recognition. Institutional reward systems seldom took full account of the individual faculty member's interest in research and development in the instructional and learning process itself.

Today, the system has reached a period of stabilized enrollments. Some campuses have experienced enrollment declines. Student mix is changing and program demand has modified significantly in recent years. Faculty face reduced opportunities to be promoted within their own departments and to seek other teaching opportunities. Student participation in campus and decision-making processes has become more systematic and continuous. Though enrollment growth has slowed, inflation, recession and other pressures upon the state budget dictate continued fiscal restrictions. These factors, as well as others, combine in a variety of ways to affect the perception of faculty, administrators, students and the public of the need for change.

Though up-to-date comprehensive faculty and student opinion surveys are not available, interest in innovation and change within the system is generally viewed as substantially greater than at the beginning of the decade, based upon overall response to the Program as well as developments on several campuses. The Program for Innovation and Improvement in the Instructional Process has contributed significantly to this heightened interest.

Phase I – 1972-73

The intent of the program in its initial phase was to identify, test, and evaluate innovations in the instructional process which would lead to increased efficiencies in student learning, greater student self-reliance, qualitative improvement in instruction without significant net cost increases, and greater student and faculty satisfactions with the higher education process.

A proposal to the Carnegie Corporation, funded in December 1971, on behalf of projects at Dominguez Hills, San Francisco, and Bakersfield stated:

> Though differing in detail, the three programs all stress the need to make it possible for students representing the broad spectrum of backgrounds and abilities to accelerate their programs toward the baccalaureate degree by certification procedures apart from the standard lecture-discussion and laboratory courses. ... For substantial numbers of students, these approaches, singly or in combination, will mean the opportunity to complete their undergraduate education in the equivalent of three academic years.

Similarly, the material supplied the state Department of Finance in December 1971 to support the special State Fund for Innovation said:

> The objective of the program for increased efficiency and innovation is to develop new methods and options through which students in the CSUC may obtain their education and meet degree objectives making the most effective use of their time and efficient use of the resources of the institution. Emphasis is placed on student self-reliance in covering established units of subject matter. ... These new approaches require the development of

new skills on the part of faculty and a variety of changes in college management and administration. ... The intended outcome of these approaches is a more efficient educational process in which greater numbers of qualified students may be served effectively and at a sound level of quality than might otherwise be the case.

Of particular importance in a retrospective view was the intended result or goal of the proposed Program:

> The long-term result of these programs will be to establish optimum levels for the time to be spent by the student in the classrooms, the extent to which he should be encouraged to move at his own pace in learning subject matter and to establish appropriate work experiences which are relevant to this degree objective. The role of the faculty member will be redirected so that he may increasingly serve as an advisor and academic counselor, rather than a lecturer, to large numbers of students pursuing a rigidly defined program.

This statement of the projected result prefaced a proposed $4.5 million program covering a two-year time span, which was ultimately funded at approximately one-third the amount, for a one-year period. Nevertheless, the statement is one upon which progress made by the Program may be assessed.

Phase II – 1973-75

By summer 1973, program results indicate a need to adjust program focus during the 1974-75 academic year. Budget request supporting material set forth these immediate objectives:

1. The primary objective of the Program will be to embed, within the ongoing campus and system operations, innovations and strategies for change which have been demonstrated to be cost-effective both in the sense of reduced unit costs, as well as increased quality for the same cost.

2. A second related objective of the program will be testing the workability and impact of campus-based funding for innovation and change as recommended by the joint Legislative Committee on the Master Plan.

3. A third objective to be served in 1974-75 will be to continue the program begun in 1972 of identifying and supporting significant proposals and innovative concepts through campus-based and system-organized projects.

4. Finally, the program for 1974-75 will stress approaches to build into the ongoing program and budget for the system provision for continued innovation and self-renewal.

Phase III – 1975 and Beyond

The outline of plans and objectives for a third phase is now being developed. This phase stresses establishment of permanent mechanisms facilitating change and innovation at the campus and system level, continuing the investment in educational research and development, increasing student satisfaction, improving faculty morale, and furthering efforts to embed both "proved" *processes* for innovation in instruction and the *products* and *results* of pilot efforts.

Program Implementation

Several assumptions have guided the Program since its inception in 1972:

1. A multi-campus system of higher education can, through articulated and coordinated pilot efforts, develop significant innovations in the instructional process which will receive a high degree of visibility not only on the host campuses, but throughout the system as well.

2. Results of individual experimental efforts, if proven worthwhile, *are* exportable either in the form of actual product materials or as a *process* of instructional reform.

3. The benefits to individual campuses as a part of a system can be demonstrated through the pooling of faculty talent, facilities and experience derived from experiment.

Results to date appear to support the general workability and applicability of these assumptions.

Since early in 1972, focus for the Program has been the responsibility of a specially organized staff section within the Office of the Chancellor. This Division of New Program Development and Evaluation has been charged with the administration of the Program, including monitoring funded projects, the coordination of dissemination results, and the overall evaluation efforts. In addition, the staff of the Division organizes workshops and conferences designed to encourage new instructional and program directions, and faculty and professional development.

Open competition among faculty for special support and recognition has been the primary method for identifying and sponsoring projects designed to meet the general objectives of the program. Guided by the advice and counsel of a Task Force on Innovation representative of the system and including two college presidents, three representatives of the Statewide Academic Senate, as well as system administrators, it was early determined that available funds would not be allocated on the basis of campus size or other arbitrary criteria. At the time of this decision few of the campuses were prepared immediately to begin the administration of special funds devoted to the purposes of innovation. Further, it was believed that it was more equitable for faculty to compete with *all* their colleagues in the system, rather than only those on their own campuses.

In recognition of increased campus interest and experience with local project administration, small campus-based and campus-administered mini-grants were instituted in 1974-75. These relatively small grants also assist in the dissemination of results of other project efforts.

In the Program's first three years of state funding emphasis was placed upon more extensive projects which usually involve faculty-assigned time during the academic year. Such release is needed because of heavy teaching loads. Though some project efforts have been limited to single courses and one faculty member, a number have involved several courses and teams of faculty, more recently across institutional boundaries. The average campus-based project grant in 1972-73 was $32,194; in 1973-74, $24,486; and in 1974-75, $18,216 (excluding campus mini-grants). Personal services have accounted for about two-thirds of the grant allocations.

Selection of projects for funding during the three years of the Program has involved a process of staff review, consultant advice and an intensive reading of proposals by the Task Force on Innovation. A final review of Task Force recommendations is made by the Chancellor before announcement of the grant awards. A further step involves the negotiation of the final budget among project director,

campus coordinator and staff of the Division of New Program Development and Evaluation. A project, even if recommended throughout the review process, may not go forward if it is found during the final on-site review that for one reason or another what was proposed cannot be carried out, or that budget adjustments cannot realistically be made. Typically, as a result of this review each year, one or two projects do not go forward.

At the outset of the Program, in spring 1972, campuses were asked to designate coordinators for innovative projects. These coordinators initially were responsible primarily for assisting faculty to apply for funds. More recently, they have assumed additional responsibilities for staffing the campus mini-grant programs, and in some instances local campus innovative programs including faculty development. The campus coordinators are taking on an increasingly important role of "change agent" on their respective campuses. Systemwide workshops sponsored through the Program and the Division of New Program Development and Evaluation have been organized to assist them in carrying out this role - a role unique to most institutions of higher education nationally. Coordinators vary in title, and include deans of Academic Planning, undergraduate deans, coordinators for Indisciplinary Studies and assistant academic vice presidents.

As the Program has developed, the number of inter-campus projects, often based upon earlier single campus efforts, has increased. These projects have developed with the close cooperation of New Program Development office staff. In some cases, special funding from state or foundation monies has been devoted to the proposal development process itself, before a decision was made to support the overall project. An important element in the Program, dictated by the fiscal limitations of funding for the system, is a requirement that, following the development and testing phase, campuses carry forward successful innovations within campus resources.

Faculty were invited to develop formal proposals involving a variety of instructional strategies which included. self-paced instruction, programmed learning, audio-tutorial approaches to learning, expanded use of technology such as television, audio-cassette, or computers, credit by examination, advanced placement and related independent study, comprehensive/challenge assessments of achievement for the degree major, new approaches to academic and career counseling, assessment of off-campus experiences for academic credit, peer instruction, inter-disciplinary programs and courses involving aspects of innovation in instructional method and design, increased linkages between academic programs and occupations, assistance to faculty and staff in learning about, and experimenting with, innovative modes of instruction, and increasing student awareness and familiarity with new modes instruction.

The above listing was not considered as wholly inclusive of all that is called "innovative." In campus visits during the application period, staff encouraged ideas beyond the specially suggested areas. Applications were discouraged, however, if they involved curricular revision which should normally occur, if they would clearly result in an add-on cost to the program without the promise of increases of efficiency or enhanced quality, or if they were research oriented, rather than directed toward improving the instructional process.

In the three years of the open competition, the greatest spread of ideas, as well as the greatest number of applications, occurred in the second year (1973-74). The third year saw increased quality in the proposals submitted, but a repetition of ideas, making the definition of truly *pilot* projects difficult. The third year found, as well, a more limited *variety* of ideas - suggesting that there was a need to change focus and grow from experience.

Projects often involve more than one instructional strategy or approach to innovation. As shown in Table 9 many have stressed, in one fashion or another, self-paced learning coupled with new modes of instruction often involving increased use of media. Many project efforts have included applications of instructional design or instructional development approaches. The more sophisticated of these efforts include the identification of the learning problem, pre-test or diagnosis of student needs, specification of detailed learning objectives for the student, and then a determination of the appropriate methods of instruction use of media, reliance on printed, programmed material, peer and tutorial assistance; self-study; and lecture and classroom discussion. All projects increasingly depend heavily upon support services. Such services are being provided by campus learning resources centers, which combine traditional audio-visual services and instructional television with professional instructional design consultation. In the ideal situation, expert assistance in student evaluation, as well as program evaluation, is provided.

Curricular Focus

In the Program's initial year sciences and occupational curricula were more heavily represented in project applications and projects funded, in the subsequent two years particular emphasis was placed upon encouraging development of project ideas in the social sciences and humanities. An examination of the distribution of projects (Table 10) by broad discipline areas indicates that, in some measure, projects were reasonably well distributed during the second two years of the fund. Data available on campus mini-grants made in fall 1974 shows approximately the same distribution.

Table 10 also indicates that roughly 20% of the projects in the first two years were multi-disciplinary and not classifiable within single broad discipline categories. Notable among these projects was the time-shortened degree program at Dominguez Hills a true mini-college of liberal arts and sciences. In addition, included in the category are projects supporting the modularization of courses at Bakersfield in the social sciences and humanities funded in 1972-73 and 1973-74, supplementing a similar activity in the sciences supported through the National Science Foundation. In great measure, multi-disciplinary projects have tended to broaden the disciplinary spectrum spanned by Program-supported projects.

TABLE 9

AREAS OF EMPHASIS
STATE GRANT PROGRAM, 1972-73/1974-75

	Independent Study	Credit By Examination	Comprehensive Core Examinations	Self-Pacing	Time-Shortened Degrees	Testing Modes of Instruction	Mediated Instruction Emphasis	Faculty Development	Dissemination of Innovations	Reduction of (Attrition	New Use of Time & Facilties	Improvement of Efficiency
PRIMARY EMPHASIS												
a. Campus	4	7	4	26	2	13	11	4	–	4	6	8
b. Inter-campus	–	1	3	2	–	1	1	4	4	–	–	4
SECONDARY EMPHASIS												
a. Campus	19	6	6	23	1	27	30	1	6	4	9	30
b. Intercampus	2	3	–	3	–	3	4	2	7	1	3	6

Note: Project renewals not listed. Projects beginning as single campus projects and later becoming an inter-campus or system project are listed in both cases.

TABLE 10

STATE GRANT PROGRAM, DISCIPLINARY EMPHASIS CAMPUS AND INTER-CAMPUS PROJECTS

Discipline	1972-73	1973-74*	1974-75*
Humanities			
Art	2	1	–
Literature	1	1	–
History	1	–	1
Communications	1	2	1
English	2	3	2
Music	–	1	–
Drama	–	–	1
	7	8	5
Social Sciences			
Psychology	2	–	2
Economics	1	1	–
Political Sci.	2	3	2
Soc. Sci.	–	3	1
Geography	–	–	1
	5	7	6
Multi-disciplinary	10	8	1
Not Applicable (Workshops, internships, etc.)	10	12	11

Discipline	1972-73	1973-74	1974-75
Science & Math			
Mathematics	4	1	1
Physics	2	1	–
Nat. Sci.	1	–	–
Gen'l. Educ. Sci.	2	2	3
Biology	1	1	1
Chemistry	2	1	2
Earth Sci.	–	–	1
	12	6	8
Prof. & Occup'l			
Human Devel.	–	1	–
Business	5	2	1
Recreation	1	1	–
Nursing	2	1	1
Engineering	3	1	1
Spec. Educ.	1	1	1
Accounting	–	–	1
	12	7	5

*Includes refunded projects, campus and inter-campus; English Equivalency Examination.

Note: Totals for each year differ slightly from other tables. A project defined for fiscal and accounting purposes may encompass more than one definable program in a given discipline.

APPENDIX B
STATE GRANT PROGRAM
PARTICIPATION BY CAMPUS AND AMOUNTS ALLOCATED

	1972-73		1973-74		1974-75		1974-75
	Campus Based	Inter-Campus Participation	Campus Based	Inter-Campus Participation[1]	Campus Based	Inter-Campus Participation[2]	Mini-Grants
		Participations		Participations		Participations	
Bakersfield	1 Grant(s)	4	1 Grant(s)	2	2 Grant(s)	5	4 Grant(s)
Amount	$74,622		$54,296		$17,969		$ 7,500
Chico	4 (Grant(s)	4	4 Grant(s)	2	3 Grant(s)	5	4 Grant(s)
Amount	88,184		84,865		62,506		10,000
Dominguez Hills	3 Grant(s)	4	2 Grant(s)	2	1 Grant(s)	3	5 Grant(s)
Amount	73,218		73,407		18,856		7,500
Fresno	1 Grant(s)	4	1 Grant(s)	2	4 Grant(s)	4	6 Grant(s)
Amount	26,324		4,889		40,568		10,000
Fullerton	3 Grant(s)	5	2 Grant(s)	3	2 Grant(s)	6	22 Grant(s)
Amount	73,854		78,470		35,460		10,000
Hayward	2 Grant(s)	4	2 Grant(s)	2	1 Grant(s)	2	5 Grant(s)
Amount	49,974		66,254		14,009		10,000
Humboldt	1 Grant(s)	3	1 Grant(s)	2	1 Grant(s)	3	7 Grant(s)
Amount	43,946		27,846		11,192		10,000
Long Beach	3 Grant(s)	4	1 Grant(s)	3	2 Grant(s)	6	9 Grant(s)
Amount	234,571		28,103		51,181		15,000
Los Angeles	3 Grant(s)	5	1 Grant(s)	4	0 Grant(s)	4	10 Grant(s)
Amount	132,715		12,296		–		15,000
Northridge	3 Grant(s)	4	5 Grant(s)	2	0 Grant(s)	5	10 Grant(s)
Amount	103,797		92,653		–		15,000
Pomona	2 Grant(s)	3	3 Grant(s)	2	1 Grant(s)	2	5 Grant(s)
Amount	80,112		98,876		27,365		10,000
Sacramento	3 Grant(s)	5	1 Grant(s)	3	1 Grant(s)	5	4 Grant(s)
Amount	68,932		26,242		23,937		10,000
San Bernardino	3 Grant(s)	3	1 Grant(s)	2	0 Grant(s)	4	5 Grant(s)
Amount	62,899		30,807		–		7,500

APPENDIX B
STATE GRANT PROGRAM
PARTICIPATION BY CAMPUS AND AMOUNTS ALLOCATED

	1972-73		1973-74		1974-75		1974-75
	Campus Based	Inter-Campus Participation	Campus Based	Inter-Campus Participation[1]	Campus Based	Inter-Campus Participation[2]	Mini-Grants
		Participations		Participations		Participations	
San Diego Amount	5 Grant(s) 128,757	3	1 Grant(s) 7,703	3	2 Grant(s) 72,191	4	11 Grant(s) 15,000
San Francisco Amount	3 Grant(s) 32,139	4	4 Grant(s) 88,194	2	1 Grant(s) 26,703	3	12 Grant(s) 15,000
San Jose Amount	2 Grant(s) 99,217	5	4 Grant(s) 76,743	4	0 Grant(s) —	6	8 Grant(s) 15,000
San Luis Obispo Amount	0 Grant(s) —	5	2 Grant(s) 39,169	3	2 Grant(s) 20,651	3	8 Grant(s) 10,000
Sonoma Amount	3 Grant(s) 75,458	3	2 Grant(s) 52,735	2	1 Grant(s) 19,801	3	5 Grant(s) 7,500
Stanislaus Amount	0 Grant(s) —	3	1 Grant(s) 11,412	2	1 Grant(s) 13,004	2	5 Grant(s) 7,500
Total-No. Grants	45		39		25		145
Total Campus-Based Projects	1,448,719		954,960		455,393		207,500
Inter-Campus/	6 Projects		8 Projects		9 Projects		NA
System Projects	189,857		217,367		555,656		NA
Total Allocated To Projects	$1,638,576		$1,172,327		$1,011,049		$207,500

(1) Excludes Organizational Development Project; Political Science Comp. – (MAP); Development of SOCRATES; Career Education Committee; Senate Faculty-Exchange. Includes English Equivalency Examination.

(2) Includes English Equivalency Examination: Excludes Use of SOCRATES, workshops for 1974-75.

APPENDIX C

INNOVATIVE PILOT PROJECTS, TABLES I-III 1972-73/1974-75

TABLE I
INNOVATIVE PILOT PROJECTS
1972/73
Final Allocations

P = Primary Emphasis — Cost Assignment
S = Secondary Emphasis

Campus/Project Title	Independent Study	Credit By Examination	Comprehensive Core Examinations	Self-Pacing	Time Shortened Degrees	Testing Modes of Instruction	Mediated Instruction Emphasis	Faculty Development	Dissemination of Innovations	CTSS	Reduction of Attrition	New Use of Time & Facilities	Improvement of Efficiency
BAKERSFIELD													
Modules for Individualized Instruction				$74,622 P		S							
CHICO													
Credit by Examination		$24,840 P											
Faculty Development in Business								$ 6,921 P					
Use of Media in Mathematics				$ 6,490 P			S						
ITV in Art				S		S	$49,933 P						
DOMINGUEZ HILLS													
Large-Group Televised Instruction in Psychological Statistics				$ 4,635 P		S	S						
Computerized Data Test Items: Science										$36,028 P			
Support for Small College Program	S	S		S	$32,555 P								
FRESNO													
Evaluation of Instructional Modes in Business						$26,324 P	S						
FULLERTON													
Alternative Approaches to General Education				S								$21,347 P	
Multi-Media Minicourses in Natural Sciences				$29,012 P			S						
Self-Paced Modules in Basic Finance				$23,495 P									
HAYWARD													
Competency-Based Programs in Business Administration				$37,747 P			S						
Competency Assessment Processes in Recreation Curricula			$12,227 P										
HUMBOLDT													
New General Education Sequence in Science				$43,946 P								S	
LONG BEACH													
Learning Assistance Support System				S		S	S				$35,549 P		S
Weekend College						S	S		S			$184,022 P	
Career Development Institute								$15,000 P	S				

TABLE I
INNOVATIVE PILOT PROJECTS
1972/73
Final Allocations

P = Primary Emphasis - Cost Assignment
S = Secondary Emphasis

Campus/Project Title	Independent Study	Credit By Examination	Comprehensive Core Examinations	Self-Pacing	Time Shortened Degrees	Testing Modes of Instruction	Mediated Instruction Emphasis	Faculty Development	Dissemination of Innovations	CTSS	Reduction of Attrition	New Use of Time & Facilities	Improvement of Efficiency
LOS ANGELES													
Self-Paced Learning in Nursing	S	S		$23,395 P			S					S	
Nursing Equipment Fund	S	S		$39,779 P			S					S	
ITV in Nursing				$69,541 P		S	S						
NORTHRIDGE													
SPIRIT: Self-Pacing Individualized Retrieval of Information by Television				$84,560 P		S	S						
Comprehensive Final Exam in Economics	S		$12,237 P										
Credit by Examination in Mathematical Physics		$ 7,000 P	S	S									
POMONA													
Project Alliance – Inter-Multidisciplinary 3SC Program	S				$68,112 P	S	S						
Audio-Tutorial Labs in Biological Sciences				$12,000 P			S						
SACRAMENTO													
Assessment of Productivity in Engineering													$32,406 P
Self-Paced Instruction in Engineering				$20,460 P			S						
U-Curve Plotting Project						$16,066 P							
SAN BERNARDINO													
Self-Paced Labs in Chemistry				$10,128 P			S						
Credit by Examination	S	$32,997 P		S			S						
Comprehensive Examinations	S		$19,774 P										
SAN DIEGO													
Open University						S	S					$57,339 P	
Advanced Chemistry Labs				$35,063 P		S							
Mathematics Classroom Teacher Support System										$27,048 P			
Credit by Examination in Literature		$ 7,000 P											
Credit by Examination in History		$ 2,307 P											

TABLE I
INNOVATIVE PILOT PROJECTS
1972/73
Final Allocations

P = Primary Emphasis — Cost Assignment
S = Secondary Emphasis

Campus/Project Title	Independent Study	Credit By Examination	Comprehensive Core Examinations	Self-Pacing	Time Shortened Degrees	Testing Modes of Instruction	Mediated Instruction Emphasis	Faculty Development	Dissemination of Innovations	CTSS	Reduction of Attrition	New Use of Time & Facilities	Improvement of Efficiency
SAN FRANCISCO													
Small Group Pe instruction						$ 9,386 P							
General Studies Credit for Experiential Learning	S	$17,753 P											
Comprehensive Exam in Political Science		$ 5,000 P											
SAN JOSE													
ITV in Special Education				$37,243 P			S						
Instructional Development Project (61,974)													
a. Art				S		S	$18,650 P						
b. Math				$ 4,140 P									
c. Electrical Engineering				$ 8,286 P			S						
d. Speech				S		S	$13,818 P						
e. Instructional Development Services				S			$17,080 P	S					S
SONOMA													
Alternative English Major	$19,806 P			S		S							
Mentorship Teaching Model						$29,749 P							
Integrated Studies for BA Degree	$25,903 P			S									
SYSTEMWIDE													
Computer-Based Curricula Interchange								$46,677 P					
Assessment of Standardized Examinations in Business	S	S	$26,180 P										
Equivalency Testing in Freshman English		$64,000 P											S
Departmental Chairman Development								$31,000 P					
Workshops for Innovation								S	$20,000 P				
Faculty Workshops								S	$2,000 P				S
	P-2 S-9 P=$45,709	P-8 S-4 $160,897	P-4 S-1 $70,418	P-18 S-10 $565,162	P-2 S 0 $100,667	P-14 S-13 $81,525	P-4 S-18 $98,581	P-4 S-3 $99,598	P-2 S-1 $22,000	P-2 S-0 $63,076	P-1 S-0 $35,549	P-3 S-3 $262,708	P-1 S-4 $32,408

TABLE II
INNOVATIVE PILOT PROJECTS
1973/74
Final Allocations

R = Renewal
P = Primary Emphasis of Project
S = Secondary Emphasis of Project

Campus/Project Title	Independent Study	Credit By Examination	Comprehensive Core Examinations	Self-Pacing	Time Shortened Degrees	Testing Modes of Instruction	Mediated Instruction Emphasis	Dissemination of Innovations	Reduction of Attrition	New Use of Time & Facilities	Improvement of Efficiency
BAKERSFIELD											
Carnegie/Cosip. Implementation and Evaluation		S	S	R $54,296 P		S				S	
CHICO											
Innovative Uses of Media in Mathematics				R $16,347 P							
Inter-University Video Link											
Faculty Development: School of Business							S			S	$40,000 P
											$ 5,484 P
New Approach to Accreditation			S								$23,034 P
DOMINGUEZ HILLS											
Small College Program Development and Evaluation	S	S		S	R $46,603						
Project Overlay: Concurrent High School/College Education					S					$26,804 P	S
FRESNO											
Comparative Modes of Instruction, Bibliographic Aids for Social Sciences				S			$ 889 P (est)				
FULLERTON											
Alternative Approaches to General Education				S						R $26,489 P	
Center for Community Internships and Cooperative Education				S		S					$51,981
HAYWARD											
Human Development Program: A Comprehensive Curriculum and Evaluation System	S	S	S	S		$43,149 P					
Competency Assessment Processes in Recreation Curricula			$23,105 P								
HUMBOLDT											
New General Education Sequence in Science				R $27,846 P						S	
LONG BEACH											
Learning Assistance Support System Center				S		S	S		R $28,103 P		

TABLE II
INNOVATIVE PILOT PROJECTS
1973/74
Final Allocations

R = Renewal
P = Primary Emphasis of Project
S = Secondary Emphasis of Project

Campus/Project Title	Independent Study	Credit By Examination	Comprehensive Core Examinations	Self-Pacing	Time Shortened Degrees	Testing Models of Instruction	Mediated Instruction Emphasis	Dissemination of Innovations	Reduction of Attrition	New Use of Time & Facilities	Improvement of Efficiency
LOS ANGELES											
The Relation Between Student Evaluation and Learning											$12,296 P
NORTHRIDGE											
Credit by Examination: Mathematical Physics		R $15,563 P	S	S							
Comprehensive Final Examination: Economics	S		R $17,114 P								
SPIRIT: Self-Pacing Individualized Retrieval of Information by Television				R $15,483 P		S	S				
Self-Paced Programmed Instruction: Musical Ear Training				S			$ 5,136 P				
Individualized Instruction: Freshman English Composition	S			S		$39,357 P			S		
POMONA											
Institute for Advanced Systems Studies	S				R $68,494 P	S	S				
Biological Sciences Audio-Tutorial Learning				R $ 8,864 P			S				
Optimizing Effectiveness of the Discussion Method						$21,518 P (est)					
SACRAMENTO											
A New Approach to Independent Learning	S			S		S				$26,242 P	
SAN BERNARDINO											
Comprehensive Examination: An Alternative to Multi-Course Classroom Instruction	S		R $30,807	S							
SAN DIEGO											
Credit by Examination Program: Literature		R $ 7,703 P									
SAN FRANCISCO											
Project for Planned Change: Behavioral and Social Sciences	S	S		$52,626 P		S	S			S	
Evaluation of Experiential Learning: General Studies		R $ 5,730 P									
Comprehensive Examination: International Relations	S	$19,050 P	S	S							
Political Science Comprehensive Exam	S	$19,050 P	S	S							

TABLE II
INNOVATIVE PILOT PROJECTS
1973/74
Final Allocations

R = Renewal
P = Primary Emphasis of Project
S = Secondary Emphasis of Project

Campus/Project Title	Independent Study	Credit By Examination	Comprehensive Core Examinations	Self-Pacing	Time Shortened Degrees	Testing Modes of Instruction	Mediated Instruction Emphasis	Dissemination of Innovations	Reduction of Attrition	New Use of Time & Facilities	Improvement of Efficiency
SAN JOSE											
Competency Programming: Special Education (ITV)				R $57,645 P			S				
Audio-Tutorial: Art History							R $ 4,000 P				
Resource-Oriented Instruction in Speech Communication				S		S	R $ 5,000 P			S	
A PSI Approach to the Basic English Composition Course	$10,098 P			S			S		S		
SAN LUIS OBISPO											
Individualized Large-Group Instruction: Chemistry						$27,875 P					
Program for Teaching Mastery: Engineering						$11,294 P					
SONOMA											
CAI: Social Science Methods Course				$30,896 P		S	S				
New Approaches to the Bachelor of Arts Degree	R $21,839 P (est)										
STANISLAUS											
A Programmed Course in Phonetics: Speech				$11,412 P (est)			S				
SYSTEMWIDE											
College-Level English Proficiency Examination		R $15,741 P									
Career Education Committee											$24,706 P (max)
Innovative Education Program Information Dissemination								$39,546 P (est)			
Computerized Test Item Bank Implementation (CTSS)											$32,855 P (est)
A Program for Faculty Exchange											$13,007 P (est)
Inter-Campus Development, Distribution and Use of Self-Learning Modules: Nursing		S		$77,117 P		S		S			
Assessment of Standardized Examination: Business			R $11,895								
Organizational Development Workshops											$2,500 P

TABLE III

INNOVATIVE PILOT PROJECTS
1974/75
Final Allocations

P = Primary Emphasis – Cost Assignment
S = Secondary Emphasis
R = Renewed Funding

Campus/Project Title	Independent Study	Credit By Examination	Comprehensive Core Examinations	Self-Pacing	Time Shortened Degrees	Testing Modes of Instruction	Mediated Instruction Emphasis	Faculty Development	Dissemination of Innovations	Reduction of Attrition	New Use of Time & Facilities	Improvement of Efficiency
BAKERSFIELD												
Academic Advising Models for Innovative Instruction Based on Student Characteristics				S		S				P $7,419 S		S
Innovations in Introductory Psychology to Facilitate Integration into Self-Paced Courses				$10,550 P		S				S		S
CHICO												
Cadre Development of Faculty								$33,808 P			S	
Evaluation of Progress Toward University Goals			S			S						R $23,984 P
Specification of Graphics Language Requirement and Software Development of Computer Graphics for Interdisciplinary Use						S	$ 4,714 P		S			
DOMINGUEZ HILLS												
Interdisciplinary Games for Social Science, General Education						P $18,865 S	S		S			
FRESNO												
Programmed Self-Instruction to Prepare Students for Classroom, Laboratory Work in Immunology and Virology	S			S			$11,840 P				S	S
Development of a Self-Guided Geography Field Study of the Southern Mother Lode Country	P $10,826 S			S			S				S	S
Project I.D.E.A. (Identification, Development, Evaluation, and Assignment)										$5,897 P		S
Project Stop-Out										$11,729 P		S
FULLERTON												
University Center for Internships and Cooperative Education				S		S						R $24,508 P
A Bi-Cultural Approach to Communication Skills						$10,952 P						

Campus/Project Title	Independent Study	Credit By Examination	Comprehensive Core Examinations	Self-Pacing	Time Shortened Degrees	Testing Modes of Instruction	Mediated Instruction Emphasis	Faculty Development	Dissemination of Innovations	Reduction of Attrition	New Use of Time & Facilities	Improvement of Efficiency
HAYWARD												
Peer and Video Instruction for Development of Skills in Acting and Pantomime Courses						$14,809 P	S					S
HUMBOLDT												
New General Education Sequence in Science				R $11,192 P		S					S	S
LONG BEACH												
Career and Personal Explorations Course				$14,592 P		S	S			S		
Experiential Instructional Mode						S	$36,589 P		S			S
POMONA												
Computer-Augmented Learning and Illustrating Facility (C.A.L.I.F.)	S					S	$27,365 P					S
SACRAMENTO												
Resource Units in Individualized Learning	S			S		S					R $23,937 P	
SAN DIEGO												
An Instructional Development Program for University Professors							S	$40,500 P				S
Modularizing and Individualizing Pre-Calculus Mathematics	S			$31,691 P			S					S
SAN FRANCISCO												
Major Assessment Profile			$26,703 P									S
SAN LUIS OBISPO												
Individualized Large-Group Instruction II: Diagnosis/Prescription			S			R $19,651 P			S			S
Teaching Mastery of Engineering Mechanics						R $1,000 P						
SONOMA												
Introductory American Government An Auto-Tutorial Self-Paced Approach to Political Science	S			$19,801 P		S	S					S
STANISLAUS												
Teaching and Research Roles in Undergraduate Education	S					S					$13,004 P	S

Campus/Project Title	Independent Study	Credit By Examination	Comprehensive Core Examinations	Self-Pacing	Time Shortened Degrees	Testing Modes of Instruction	Mediated Instruction Emphasis	Faculty Development	Dissemination of Innovations	Reduction of Attrition	New Use of Time & Facilities	Improvement of Efficiency
SYSTEMWIDE & INTER-CAMPUS*												
An Interdisciplinary Modularized Program for Non-Science Majors				$68,411 P		S	S		S		S	S
Assessment of Exit-Level Examinations in Business Administration	S	S	R $ 7,772 P									
Competency Programming in Special Education							S		R $29,017 P			S
Development of Comprehensive Examinations: Chem. & Acct.	S	S	R $73,623 P				S		S			S
Earth Science Curriculum Development Consortium				S			$64,044 P		S		S	
Individualized Instruction in Freshman English	S			S		R $88,852 P			S	S		
Modularized Instruction/Learning in Nursing within the CSUC System	S	S		R $85,709 P		S			S			S
Student-Oriented, Classroom Analysis and Test Evaluation System (SOCRATES)		S		S			S		S		S	$50,172 P
Faculty Development — System Program								$88,056 P				
Mini-Grant Program	$207,500	Approx. 125 projects through December 1974 on 19 campuses										

*Other projects under development to disseminate results and materials developed from prior year's projects.

APPENDIX D

SUMMARY OF PARTICIPANTS
PILOT PROJECTS FOR INNOVATION
1972-73

LOG	TITLE	CAMPUS	STUDENTS	FACULTY
72-03	ITV/Nursing	Los Angeles	867	18
72-06	B.A.L.S.	Sonoma	120	4
72-07	ITV Art	Chico		5
72-10	Data Bank	Dominguez Hills		6
72-12	ITV/Competency Programming Special Education	San Jose	129	7
72-13	Instructional Development	San Jose	116	4
72-16	CTSS (System)	San Francisco	0	540
72-18	General Education	Fullerton	1,387	23
72-19	SPIRIT	Northridge	38	4
72-20	Weekend College	Long Beach	160	13
72-24	Alliance	Pomona		25
72-25	Open Labs/Chemistry	San Diego	160	4
72-26	CTSS Math	San Diego	2,200	8
72-39	Eval 2 Mode	Fresno	50	9
72-41	Self-Pacing Nursing	Los Angeles	228	14
72-22	Equipment Nursing	Los Angeles		1
72-51	Comp Based/Bus Ad	Hayward	49	1
72-60	SP/Financing	Fullerton		1
72-64A	Faculty Center	Chico	16	65
72-64B	Credit by Examination	Chico	16	38
72-65	Media/Math	Chico		3
72-66	C-B-X/Independent Study	San Bernardino	62	4
72-68	SP Labs/Chemistry	San Bernardino	49	1
72-71	Gen Ed/Science	Humboldt	24	4
72-74	Assessment Productivity/Engineering	Sacramento		1
72-81	SP/Engineering	Sacramento		4
72-82	U Curve Plotting	Sacramento	82	1
72-89	SP Mini-Courses/Science	Fullerton	318	4
72-106	Learning Assistance	Long Beach	3.500	1
72-114	Individual Instruction	Bakersfield	1,500	75
72-116	Open U	San Diego		1
72-126	Exper. Course Large Scale	Dominguez Hills	176	2
72-127	Credit for Experience	San Francisco	174	4
72-130	A/T Bio Science	Pomona	300	9
72-133	Peer Instruction	San Francisco	946	5
72-136	Mentor Model	Sonoma	650	58
72-137	Carnegie Support	Dominguez Hills	150	11
72-138	Alt. Major/English	Sonoma	68	13
72-139	Multi Course Comp Exam.	San Bernardino	41	5
72-140	Prog.-Eval Business	Sacramento		8
72-141	Dept. Chairman Development	FSA		45
72-142	Career Development	Long Beach		29
72-143	Engl. Equiv Exam.	System	4,100	40
72-144	Comprehension Economics	Northridge	20	2
72-145	C-B-X	Northridge		3
72-146	History C-B-X	San Diego	30	3
72-147	Comp Assessment/Recreation	Hayward		5
72-148	C-B-X Literature	San Diego	32	3
72-149	Workshops for Innovation	New Program Development and Evaluation		300
72-150	Comp Xs. SS	San Francisco	8	6
72-151	Dept Chairman/Dean W/Shop	Dominguez Hills		50
	PSI Institute	Long Beach		590
	Baccalaureate Conference	System	18	150

APPENDIX D

SUMMARY OF PARTICIPANTS
PILOT PROJECTS FOR INNOVATION
1973-74

LOG	TITLE	CAMPUS	STUDENTS	FACULTY
73-01	Small College	Dominguez Hills	250	22
73-02	Learning Assistance	Long Beach	3.000	1
73-04	Project Alliance	Pomona	69	21
73-09	Faculty Development	Chico		65
73-13	Inter-university Video Link	Chico		30
73-16	Discussion Method	Pomona	350	6
73-17	AT Bio Science	Pomona	765	5
73-20	Media Math	Chico	217	5
73-27	Alt. App. G.E.	Fullerton	800	30
73-37	Community Internships	Fullerton	1,238	30
73-59	Large Group Instruction	San Luis Obispo	400	4
73-61	Mastery/Engineer Mechanics	San Luis Obispo		1
73-63	Phonetics	Stanislaus	18	1
73-76	Cx. Ex. Literature	San Diego	88	3
73-77	Students Evaluation & Learning Relationships	Los Angeles	700	1
73-89	Overlay	Dominguez Hills	75	4
73-94	Comp. Exam. Multi Course	San Bernardino	41	6
73-95	Gen'l. Educ/Sci	Humboldt	92	5
73-105	Eval Progress to U Goals	Chico		5
73-107	Bibliog Aids in SS	Fresno	93	3
73-120	CAI/SS Methods	Sonoma		2
73-126	BALS	Sonoma	120	4
73-133	PSI/Basic Comp	San Jose	95	3
73-139	Comp Programming Special Education	San Jose	560	60
73-140	AT/Art History	San Jose	89	3
73-141	Resource-Oriented Speech Communication	San Jose	200	5
73-146	Individ Instruct Freshman English	Northridge	200	4
73-148	CXE, Math Physics	Northridge	49	4
73-150	SP Musical Ear Training	Northridge		1
73-155	SPIRIT	Northridge	400	9
73-156	Faculty Exchange	System		1
73-162	Credit for Experiential Learning	San Francisco	161	4
73-177	Project for Planned Change	San Francisco	1,081	23
73-197	Resource Units	Sacramento	70	5
73-204	Human Development Program	Hayward		5
73-210	Competency Assessment Recreation	Hayward		5
73-212	Assessment Standardized Exams/Business	System	1,293	6
73-214	PACE	Bakersfield	2,500	70
73-215	Computerized Test Bank	System		40
73-216	Career Education Committee	System		8
73-217	College Level English Proficiency	System	3,639	40
73-218	Dissemination Innovation	System		325
73-219	Inter-Campus Development Nursing	System	500	30
73-220	Alternative Model	System		5
73-221	Competency Exam Poli Science	System (SF)		25
73-222	Organizational Development	FSA		125
	Creative Change Conference	New Program Development and Evaluation		150

APPENDIX E

SELECTED BIBLIOGRAPHY OF DOCUMENTS RELATING TO THE CALIFORNIA STATE UNIVERSITY AND COLLEGES INNOVATIVE PROGRAM

TITLE AND DATE	COMMENTS
Program for Innovation, The First Two Years. November 1973.	Summary and evaluation of pilot projects which test innovative approaches to instruction.
Pilot Projects for Implementation of Planned Change in a System of Public Higher Education. September 1971.	A proposal to the Carnegie Corporation of New York for a grant to support innovative projects for the California State Colleges.
Evaluation of Projects for Planned Change: A First Report to the Carnegie Corporation of New York. June 1972.	Plans for evaluation of pilot projects funded by the Carnegie Corporation.
Implementation of Pilot Projects for Planned Change, Phase I, 1972-73. December 1973.	Evaluation of projects funded by a grant from the Carnegie Corporation of New York. Included are discussions of the three-year baccalaureate, self-pacing and student attitudes.
Toward Planned Change: A Case Study of Innovation in a Large System of Public Higher Education. October 1974.	A case study of innovation in the CSUC system – prepared for the Forum for Chief Academic Officers of Multi-Campus Universities, San Diego, California, October 9, 1974.
The Meaning of the Baccalaureate. April 1973.	Proceedings of a systemwide conference concerned with the quality and purposes of undergraduate education.
The Future of General Education in The California State University and Colleges. January 1973.	Proceedings of a systemwide conference which addressed the purposes and directions of liberal education and considered new approaches to general education.
Future Talk, Issue No. 1, Fall 1972.	A quarterly newsletter about developments in academic innovations; both within the CSUC system and nationwide.
A Proposal for Change in the California State Colleges. January 1971.	A major policy statement by Chancellor Dumke stressing the need for continued assessment of the instructional program and proposing new directions for the CSUC.
New Approaches to Higher Education with The California State University and Colleges. September 1974.	Accomplishments of the system since the initiation of the "New Approaches" program.
Comparison and Contrast, The 1973 California State University and Colleges Freshman English Equivalency Examinations. October 1973.	Analyzes the results of the Freshman English Equivalency Examination implemented under the CSUC Fund for Innovation and Improvement in the Instructional Process.
A Report of the 1973 California State University and Colleges Systemwide Research Project on the College Level Examination Program General Examinations in Humanities, Natural Sciences and Social Science-History. August 1973.	Descriptive data of the performance of representative CSUC sophomores on the CLEP general exams 1972.
Self-Paced Learning: A Perspective. January 1975.	A discussion paper on self-paced methods of instruction.

TITLE AND DATE	COMMENTS
Project Overlay: An Experiment in Curricular Cooperation Between the College and the High School. January 1975.	Examines the feasibility of combining the last year of high school and the first year of college into a concurrent year of education.
Instructional Efficiency Through Message Design. February 1975.	Details the results of an innovative project which tested the relationship between the degree of complexity of course materials and student ability.
Competency Programming in Special Education. April 1975.	A monograph detailing the development of a performance-based, media-oriented program involving generic and advanced specialization courses in special education.

APPENDIX F

SUMMARY OF PROJECTS PROGRAM FOR INNOVATION 1972-75

INDEPENDENT STUDY

TITLE: New Approaches to the Bachelor of Arts Degree — **LIBERAL STUDIES**
PROJECT DIRECTOR: *Eugene Soules, Professor of English*
CSC, Somona

The project is to develop a model Liberal Studies program consisting of four upper-division modules in English, humanities, natural science, and social science. The student progresses from the first unit dealing with skills and intra-disciplinary relationships, to the application of skills and cross-disciplinary relations. An alternative to a more traditional undergraduate approach, students participate in intra-disciplinary seminars each semester. Independent study is stressed within the program. The program has developed and served 132 students in 1974-75.

TITLE: Alternative Major in English — **ENGLISH**
PROJECT DIRECTOR: *Richard H. Hendrickson*
Associate Professor of English
CSC, Sonoma

The objectives of this project are to: (1) To develop a model program at the department level that is innovative in form but traditional in subject-matter. (2) To provide maximum opportunity for mature, self-reliant students to tailor their majors to replace particular career goals or interests and complete them as rapidly as possible. (3) To improve educational effectiveness and efficiency by exploring a wide range of alternatives to conventional instruction. (4) To evaluate student progress directly in terms of competencies and experiences gained rather than courses and units completed.

The pilot program is a highly individualized, project-oriented major offering greater freedom and responsibility in the study of English. Independent study, both on and off the campus, largely replaces classroom instruction, with faculty members acting chiefly as advisors and resource persons. Credit is granted on completion of each phase of a student's study plan, with frequent reviews of progress. The program is ongoing and is in full implementation. Approximately 70 students have chosen the option in 1974-75.

TITLE: Resource Units in Individualized Learning — MULTI-DISCIPLINE

PROJECT DIRECTOR: *John Hester, Associate Professor of Mechanical Engineering, Sacramento*

The aim of this interdisciplinary experiment, begun in 1973, is to introduce a flexible form of individualized, interdisciplinary instruction at the advanced undergraduate level in economics, engineering, English, government, history, journalism, psychology and social work. The basic formula assigns up to 20 students to one faculty member for a full teaching load, and a 15-unit course load for each student. The project provides enhanced opportunities for upper-division students to engage in individualized and personalized inquiry, involving them in close working relationships with faculty and other students. The program, in its second year of operation is serving approximately 70 students.

TITLE: Teaching and Research Roles in Undergraduate Education — PSYCHOLOGY

PROJECT DIRECTORS: *Thomas Gentry, Gary Novak, and Frank Wallace, Assistant Professors of Psychology, Stanislaus*

After an introductory psychology competency screen, junior-level undergraduates join "colleague groups" composed of graduate students and faculty to conduct research and then design and present a course in one of the subject areas of psychology. The project allows undergraduates to assume the role of teacher and researcher, with the objective of evaluating this type of early career role experience, leading to a more rapid development of professional interest and ability.

TITLE: Development of a Self-Guided Geography Field Study of the Southern Mother Lode Country — GEOGRAPHY

PROJECT DIRECTOR: *Merrill M. Stuart, Associate Professor of Geography, Fresno*

The project will develop materials for self-guided field trips in the southern Mother Lode country. It will provide geography students with an out-of-the-classroom self-learning experience via audio tape commentaries on significant geographic features of the region. The project also provides time flexibility to students with scheduling problems.

CREDIT BY EXAMINATION

TITLE: Credit by Examination: Mathematical Physics — **PHYSICS**
PROJECT DIRECTOR: *M. N. Moore, Professor of Physics, CSU, Northridge*

The pilot project aims to teach students to teach themselves Mathematical Physics, using the Keller Plan format of self-paced modularized learning. Evaluation of the effectiveness of the methods includes an evaluation of student learning by examination; and an evaluation of the success of the project by comparison with students enrolled in the regular program. A project monograph is to be available in spring 1975. The program is continuing with several instructors using the approaches and techniques.

TITLE: Credit by Examination Program in Literature — **LITERATURE**
PROJECT DIRECTOR: *William A. Perkins, Professor of Literature, San Diego State University*

This project involves credit-by-examination program in literature and was begun in spring 1973. Challenge examinations test competence in literary survey courses on the sophomore level. The project is continuing with about 30 students each semester seeking credit.

TITLE: College-Level English Proficiency Examinations — **ENGLISH**
PROJECT DIRECTORS: *Richard Lid, Professor of English, CSU, Northridge; and Edward White, Professor of English, CSC, San Bernardino*

In May 1973, more than 4,000 students took a combination objective and essay examination sponsored by the system and the English Council. The examination was offered once again in spring 1974. Funds provided ensure articulating the program within the system, preparing the necessary public information documents, and establishing liaison with each campus for the administration of the examinations in the spring. The program is continuing in 1974-75 through a special State appropriation.

TITLE: Evaluation of Experiential Learning: General Studies — **GENERAL EDUCATION**
PROJECT DIRECTOR: *Bernice Biggs, Undergraduate Studies, San Francisco State University*

Under an initial grant in 1972/73, faculty members from four academic areas participated in developing credit-by-examination procedures for assessing the academic credit to be awarded for learning in non-academic (off-campus) situations. The number of students who submitted petitions for credit by examination, the

student-credit hours produced, and faculty time used in evaluation provide the basis for a workload proposal for regular assignment of faculty time for the purpose. The program serves about 130 students per year and is a permanent part of the San Francisco curricula.

TITLE: Credit by Examination **MULTIDISCIPLINE**
PROJECT DIRECTOR: *Ralph H. Petrucci, Dean*
Academic Planning, CSC, San Bernardino

The principal objectives of this pilot project fund in 1972-73 were to strengthen independent study and to increase the number of successful challenges in the credit-by-examination program of the college; to develop resource materials to improve the performance of regularly enrolled students, and to provide a mechanism which will provide additional opportunities for high school students to gain college credit.

Four courses in the college curriculum were established utilizing recent developments in educational technology in such a fashion that selected students could study these courses and challenge them on a completely independent study basis. The most successful program, a statistics course, has continued and registers about 35 students per term. A literature course was offered on the independent study – credit-by-examination mode for several terms and may be offered again as student demand was substantial. A biology and educational psychology course are no longer offered in the credit-by-examination mode for various reasons.

TITLE: Credit By Examination **MULTI-DISCIPLINE**
PROJECT DIRECTOR: *Phyllis Bush, Associate Vice President, CSU, Chico*

To encourage student learning based upon diverse entry levels and professionally determined goals for individual courses, sequence courses and progress completion; to pre-establish levels of competence for experiential learning. Several courses were offered for credit by examination to fulfill project objectives. Limited student response led to discontinuance of the program.

TITLE: Credit By Examination in Western Civilization **HISTORY**
PROJECT DIRECTOR: *Oddvar Hoidal, Professor of History, San Diego State University*

A challenge examination program for credit in Western Civilization was developed as an alternative to the course currently offered in history. The examination in the form of essay questions filled General Education requirements in the Scope of Civilization. The objective of the project was to provide

a means by which students may receive credit for demonstrated mastery of a specified body of knowledge normally covered by the parallel regular course. After a semester's experimentation, the program was cancelled because of limited student interest and success on the examinations.

COMPREHENSIVE/CORE EXAMINATIONS

TITLE: Assessment of Standardized Examination in Business **BUSINESS**
PROJECT DIRECTOR: *Malcolm White, Associate Professor of Business, CSU, Sacramento*

Under 1972/73 funding, a team of faculty from business programs at Fullerton, Los Angeles, Sacramento, San Jose and San Luis Obispo directed experimental administration of subject matter examinations in business developed by the University of the State of New York (New York Regents), as well as the Undergraduate Program Examination in business available through the Educational Testing Service. The project was continued in 1973-74 to validate the New York tests and norm them in terms of California student populations.

Outcomes of this project include: comparison of California and New York scores; score comparison among CSUC campuses; correlation of scores with grades; and an analytical critique by faculty on each campus of each examination. Final reports on the project will be available in spring 1975. Results are being studied closely by the CSUC Consortium for its program in business.

TITLE: Competency Assessment Processes in Recreation Curricula **RECREATION**
PROJECT DIRECTOR: *Edward W. Niepoth, Professor of Recreation, CSU, Chico*

This multi-campus project defined required competencies for a recreation major by the use of systematic assessment processes at different points in the program of study leading to the baccalaureate.

Initially funded in 1973, the project in 1973/74 tested processes to further identify and refine appropriate assessment models.

The project study team was composed of recreation faculty from the San Francisco and San Jose campuses, and recreation and educational psychology faculty from the Hayward campus. Campus departments in 1974-75 are reviewing results for implementation on the separate campuses. Project materials developed as a part of the project are being used at Hayward and San Jose.

TITLE: Comprehensive Examination: An Alternative to Multi-Course Classroom Instruction — MULTI-DISCIPLINE

PROJECT DIRECTOR: *Leslie E. Van Marter, Professor and Department Chairman, Philosophy, CSC, San Bernardino*

This project attempted to achieve revision, refinement and expansion of four three-course Comprehensive Examinations in Upper-Division subject matter that registered their first students during 1973. The subject areas were sociology (two programs), upper-division general education, psychology, criminal justice and administration. The comprehensive, core program in upper-division general education is serving 37 students who have registered for 10 quarter units during winter 1975 and an additional 11 who are pursuing 15 units of work. The program is operating at a 36:1 student-faculty ratio. The administration program is under revision as it has been found that most students in the major are part-time and could not attempt a 15-unit self-study program as was required in this instance.

TITLE: Comprehensive Final Examination in Economics — ECONOMICS

PROJECT DIRECTOR: *James L. Esmay, Chairman, Department of Economics, CSU, Northridge*

The primary objectives of the project were to develop a comprehensive examination for graduating senior economic students and to improve teaching effectiveness in the economics department.

An examination was developed and administered to seniors. Results led to departmental program review.

TITLE: Major Assessment Profile — POLITICAL SCIENCE

PROJECT DIRECTORS: *DeVere E. Pentony, Dean of the School of Behavioral and Social Sciences, and Ralph Goldman, Professor of Political Science, San Francisco State University*

This project seeks to develop and implement a strategy for the systematic identification of desired competencies in the political science major. Through this process, it is hoped to construct prototypic comprehensive competency instruments to be tested, validated and extended in several stages. It is anticipated that this model will be useful for undertaking similar efforts in other social science disciplines. Representatives from several campuses have been actively involved in the project's development.

TITLE: Development of Comprehensive Examinations in Chemistry and Accounting — CHEMISTRY ACCOUNTING

PROJECT DIRECTOR: *Gene Geisler, Associate Director, CSUC Division of Information Systems*

The project through the use of a computerized test item data bank (SOCRATES) is developing test items for use in comprehensive testing programs in chemistry and accounting. (See also related computerized test item data projects.)

SELF-PACING

TITLE: Biological Sciences Audio-Tutorial Learning Centers — BIOLOGY

PROJECT DIRECTOR: *Howard W. Brown, Professor of Biological Science, CSPU, Pomona*

The objective of the project was to increase learning effectiveness in the biological sciences. The project included development of an audio-tutorial program in science courses begun in 1972/73. An anticipated outcome, now being realized, is the more effective use of physical facilities and faculty through flexible scheduling. Over 200 students make use of the open, self-paced laboratory. In addition, other faculty have placed their courses on a similar format making use of the facilities.

TITLE: Carnegie/Cosip: Implementation and Evaluation — MULTI-DISCIPLINE

PROJECT DIRECTOR: *Thomas M. Watts, Dean, School of Behavioral Sciences, CSC, Bakersfield*

This college-wide program has included the development and offering of modularized courses, interdisciplinary programs in a living-learning setting, and credit by evaluation. The program is continuing in various forms throughout the campus. A comprehensive report on the program will be available in spring 1975. The program has received support from the Fund for Innovation, the Carnegie Corporation and the NSF/COSIP.

TITLE: Computer-Aided Instruction in Social Science Methods Course — SOCIAL SCIENCE

PROJECT DIRECTORS: *John F. Kramer, Associate Professor of Political Science; and Donald Dixon, Assistant Professor of Political Science, CSC, Sonoma*

This project included the production of a sequence of computerized instructional modules designed for the time-sharing system designed for students studying techniques of social science research, i.e., data analysis, sampling and statistics, and measurement. The system is auto-tutorial and self-pacing. It provides the student with immediate feedback, and maintains a record of each student's progress for himself and the course

instructor. It has been tested and evaluated in two political science methods classes during the spring semester 1974. Delay in extending the use of the materials was encountered due to availability of system computing resources.

TITLE: Innovative Uses of Media in Mathematics — MATHEMATICS
PROJECT DIRECTOR: *Thomas A. McCready, Professor of Mathematics, CSU, Chico*

The principal objective of this project was to develop and pilot test modular, single-concept instructional packages for intermediate algebra, calculus, and other mathematical subjects. The packages developed consist of slides, synchronized tape recordings and workbooks, suitable for either classroom use on a PSI mode or individual study. The calculus sequence has not been fully completed.

TITLE: Inter-Campus Development, Distribution and Use of Self-Learning Modules (Nursing) — NURSING
PROJECT DIRECTOR: *Lee McNall, Assistant Professor of Nursing, CSU, Los Angeles*

This inter-campus project involves 14 campuses. The project is designed to test whether or not inter-campus collaboration in the identification and development of common nursing content into self-learning modules will produce modules acceptable to both curricula. It is anticipated that distribution of self-learning modules from one State University program into another will provide data to predict the feasibility of establishing an inter-campus storage and retrieval system. The project also seeks to demonstrate that a nursing faculty on another campus that indicates readiness to use self-learning materials can be prepared to develop and administer self-learning modules. A self-learning module bank has been developed for the use by the system, which includes to date 70 modules. The intent is to establish a permanent inter-campus exchange program in self-learning materials.

TITLE: Program for Planned Change in Behavioral and Social Sciences — MULTI-DISCIPLINE
PROJECT DIRECTORS: *DeVere Pentony, Dean; and Robert Picker, Associate Dean, School of Behavioral and Social Sciences, San Francisco State University*

Under an initial grant from the Carnegie Corporation, this project involved the ten academic disciplines of the School of Behavioral and Social Sciences. It offers a variety of alternatives for learning and faculty utilization by curricular innovation. The project has included development of competency diagnostic examinations and post tests; refinement of self-pacing materials, and an

evaluation of the total program. The project has included an alternative psychology major, a new curriculum in international relations, comprehensive examinations in international relations and political science (MAP program), peer instruction in political science, self-paced courses in economics and history and credit by examination in sociology. A comprehensive report will be available in spring 1975. A report on the international relations aspect is available from the campus.

TITLE: Modularizing and Individualizing Pre-Calculus Mathematics — MATHEMATICS

PROJECT DIRECTOR: *Herbert A. Gindler, Professor of Mathematics, San Diego State University*

The objective of the project is to modularize and individualize pre-calculus mathematics in such a way that each student will be able to proceed at his or her own pace to complete those modules identified as needed for his or her own educational program and goals. (This will benefit primarily the non-science majors who will be able to have the course tailored to their specific needs.)

TITLE: New General Education Sequence in Science — SCIENCE/ GENERAL EDUCATION

PROJECT DIRECTOR: *Raymond W. Barratt, Dean of School of Science, Humboldt State University*

This project is one of a series of alternative pathways offered by the new General Education Science program, which matches student profiles with various instructional modes to insure maximum educational benefit with optimum efficiency of resources.

The project has designed and pilot-tested inter-disciplinary, self-paced modularized courses based on the Individually Prescribed Instruction Mode. A learning center has been established. The project is continuing, with savings being achieved in use of equipment and supplies. Spin-off programs have also developed in mathematics.

TITLE: A Programmed Course in Phonetics: Speech — SPEECH

PROJECT DIRECTOR: *Susan E. Kellogg, Lecturer of Speech Pathology and Audiology, CSC, Stanislaus*

This pilot project developed a self-paced, programmed course in phonetics, consisting of units of subject matter arranged in a linear program format, and audio and videotaped transcription practice material with study guide answer sheets. A final comprehensive examination was administered to both experimental and control groups taught by traditional methods and the scores of the two groups statistically compared. The

materials continue to be used at Stanislaus and the project has resulted in increased interest in PSI approaches on the campus.

TITLE: A PSI Approach to the Basic English Composition Course — **ENGLISH**

PROJECT DIRECTOR: *Marylou Lewandowski, English Department, San Jose State University*

The project included development of a personalized instructional approach to basic English composition. The composition competencies of entering students are diagnosed, and mediated materials and activities are prescribed to ensure that students overcome weaknesses and achieve satisfactory competency levels and positive attitudes toward written communication. The method was tested in six sections on the campus in spring 1974 and was offered in four sections in fall 1974.

TITLE: Teaching of Experimental Course Appropriate for Large-Size Classes — **PSYCHOLOGY**

PROJECT DIRECTOR: *Quentin C. Stodola, Department of Psychology, CSC. Dominguez Hills*

The project objectives were to: (1) demonstrate the feasibility of teaching a standardized repeatable course in tests and measurements, providing effective instruction with the use of limited resources through ITV and other techniques; (2) prepare a teacher's guide to accompany the demonstration course which would provide specific direction for course instruction; (3) estimate the cost of teaching such a course after the initial development.

The project resulted in a comparison of different teaching strategies. The television mode proved the least successful in terms of student interest and persistence. A report on the project is available from the project director.

TITLE: The Application of Mini-Courses in the Natural Sciences, A Multimedia Approach to Self-Paced Learning — **SCIENCE**

PROJECT DIRECTOR: *Kenneth L. McWilliams, Associate Professor of Zoology, Department of Biology, CSU, Fullerton*

There were five major objectives of the project funded in 1972-73: (1) to create a laboratory learning center of approximately 32 student-learning booths, each equipped with appropriate hardware (cassette players, projectors, etc.); (2) to develop, prepare, and evaluate a large number of mini-courses on selected subject matter appropriate to three ongoing traditional courses at California State University, Fullerton; (3) to compare

and evaluate competence levels achieved by "traditional" students and "learning for mastery" students; (4) to create an "open-module" system whereby the student can take any "mini-course" at any given time. This allows advisors and their students to develop programs of selected "mini-courses" which would best suit the interests or career objectives of the individual student; (5) to develop, prepare and evaluate mini-courses on selected subject matter appropriate to the general education courses offered by the Biology Department.

The program is continuing and has since developed additional materials with widening faculty interest in the use of mediated materials and learning modules.

TITLE: Self-Paced Learning Modules: An Application in Basic Finance **BUSINESS**

PROJECT DIRECTOR: *Dennis J. O'Conner, Professor of Finance, CSU, Fullerton*

The objective of this 1972-73 pilot project was to organize the material in the Basic Finance course so the student may: (1) accomplish more in the course; (2) proceed through the course at his own pace; (3) attain a prescribed minimal level of competence in the subject area. In addition, an attempt was made to achieve a more efficient utilization of faculty resources.

The repeated module (or unit) format emphasizes the division of the subject matter of Basic Finance into discrete modules. The modules are presented in sequence and the student completes each module before moving on to the next module in the sequence. The format calls for a reduction in the number of classroom hours. Multimedia demonstrations and programmed learning aids are important features of the system. The student will be able to complete the course in as little as two months. The project is going forward serving a large number of students. Additional courses in business may be placed on the same format.

TITLE: Competency-Based Program in Business Administration, Department of Management Sciences, Industrial Relations Option **BUSINESS**

PROJECT DIRECTOR: *Allen J. Schuh, Assistant Professor, Department of Management Sciences, CSU, Hayward*

Designed to develop and implement a time-flexible, performance-based program, this 1972-73 project was at the undergraduate level for an Industrial Relations option within the School of Business and Economics. The pilot project consisted of: (1) reviewing existing programs outside the system; (2) planning the required and optional competencies within the

option; (3) implementing a workshop for the other universities and colleges in the system; (4) development of modules to replace existing courses in the option. The program, though achieving success in its trial run, could not be continued by the campus because of the reallocation of resources required.

TITLE: Development of Courses and Procedures to Employ the Principles of Self-Directed Learning and Self-Pacing in Prescribed Nursing Study Programs **NURSING**

PROJECT DIRECTOR: *Ann Sloat, Assistant Professor, Department of Nursing, CSU, Los Angeles*

The 1972-73 project demonstrated that faculty using self-learning materials and media can increase the numbers of students they teach and shorten student achievement time without decreasing student achievement level. The project investigated possible administrative changes needed to implement principles of self-directed learning and self-paced progress.

The program involved preparation of three nursing courses using mediated self-learning materials and offering them as experimental courses which allow the student to study, test and progress, based upon achievement. The comparison between the findings in these courses and their traditional counterparts served as the basis for recommending implementation in a new nursing curriculum. The materials developed in the project are in use at Los Angeles and, in part, served as the basis for an inter-campus project.

TITLE: Measurements in Engineering by Self-Paced Instruction **ENGINEERING**

PROJECT DIRECTOR: *John Zickel, Professor of Mechanical Engineering, CSU, Sacramento*

This 1972-73 project sought to utilize latest techniques and equipment for use in the laboratory, the machine shop and industrial plant. The learning process was reinforced by a number of experiments in the actual use of the demonstrated tools. Measurement techniques were divided into the three areas of mechanical, electrical power, and electronic engineering. Modules for each were prepared in a programmed text form and on tape for self-paced instruction. The project was only partially completed before funding ended.

TITLE: Self-Paced Labs in Chemistry **CHEMISTRY**

PROJECT DIRECTOR: *Kenneth Mantei, Associate Professor of Chemistry, CSC, San Bernardino*

This pilot project's basic objective was to eliminate tight scheduling of labs. The experiment sought to: (1) avoid problems

of schedule conflicts; (2) allow students to work more effectively at their own pace; (3) alter the faculty role by reducing the need for faculty presence in the lab and providing more individualized assistance. Experience with this approach could lead to an efficient means of evaluating lab skills of students wishing to receive credit by examination. Laboratory instructions for carrying out experiments and evaluating the results were put on videotape cassettes. The project was not fully implemented, in part due to curricular changes made by the Department of Chemistry.

TITLE: Integration of Advanced Chemistry Laboratory — **CHEMISTRY**
PROJECT DIRECTOR: *Walter D. Jones, Professor, Department of Chemistry, San Diego State University*

This program created a single laboratory for upper-division chemistry by (1) using integrated projects in the laboratory that involve interdisciplinary instruction; (2) using new methods of evaluation including credit by practical examination; and (3) using audio-visual instruction. The project integrated instrumental analysis and physical chemistry laboratories centering on multiple objective laboratory projects. The laboratory is in current use and has resulted in a more efficient use of student and faculty time.

TITLE: Introductory American Government: An Auto-Tutorial Self-Paced Approach to Political Science — **POLITICAL SCIENCE**
PROJECT DIRECTORS: *Donald A. Dixon, Assistant Professor, and John F. Kramer, Associate Professor of Political Science, CSC, Sonoma*

An emphasis on self-pacing characterizes this project which seeks to familiarize American Government students with the complex society in which they live, and to generate sufficient interest in politics to ensure informed, active citizenship. Work begun in conjunction with the 1974 summer workshop on new materials for American Government, funded by the American Political Science Association, the Inter-University Consortium for Political Research and the National Science Foundation, together with additional modules and supporting materials, will be adapted for application in the CSUC system. Based on the Keller Plan format, 15 self-paced, auto-tutorial modules will be designed, each with a built-in set of testing and learning objectives.

TITLE: Career and Personal Explorations Course — **ADVISEMENT**
PROJECT DIRECTORS: *Kenneth Weisbrod, Dean, and Tom Stevens, Counselor, Counseling and Testing Department, CSU, Long Beach*

This course will provide an intensive career and life planning experience for undeclared majors, using a combination of self-paced individualized instruction, psychological testing, group discussion and world-of-work experience. It aims to increase students' knowledge of general career information in their intellectual areas of interest; to demonstrate their own abilities, skills and personalities, and see how these relate to college and career success; and to aid students in developing job search skills.

TITLE: Innovations in Introductory Psychology to Facilitate Integration Into Self-Paced Courses — **PSYCHOLOGY**

PROJECT DIRECTOR: *Mary J. Allen, Lecturer in Psychology, CSU, Bakersfield*

The Psychology Department on this campus implemented a core sequence for upper-division majors that involved modularized self-paced courses. A substantial number of students experienced difficulty adapting to the freedom and emphasis on individual initiative required by self-paced instruction. The project will develop a series of experiences for the introductory psychology course that will increasingly approximate those of self-paced courses in presentation, content and evaluation. These units will be designed to operate independently and in any sequence, so that the introductory instructor can select and order the units to supplement and enhance his or her course.

TITLE: An Interdisciplinary Modularized Program for Non-Science Students — **SCIENCE/ GENERAL EDUCATION**

PROJECT DIRECTOR: *Jerrold Kemp, Coordinator of Instructional Development Services, San Jose State University*

This inter-campus project is developing mediated, modularized materials for use in courses for non-science majors. The project seeks to apply instructional design approaches. Faculty engaged in the effort represent three campuses: San Jose, Bakersfield, and Fullerton. Course materials developed will be pilot tested on the respective campuses.

TITLE: Individualized Instruction in Freshman English Composition — **ENGLISH**

PROJECT DIRECTOR: *Robert Y. Noreen, Associate Professor of English, CSU, Northridge*

This project provided individualized instruction in a one-semester skills development course of freshman English. The project provides for diagnosis of individual student achievement levels in each of the three skills areas; for self-paced instruction to acquire needed skills; and for a variety of teaching-learning situations including modular instruction, peer group instruction and evaluation, and individual and group tutoring. The program is

being implemented in six English sections at Northridge and has been extended to include four other campuses in 1974-75: San Diego, Sacramento, Fullerton, and Chico.

TIME-SHORTENED DEGREES

TITLE: Project Alliance — **SYSTEMS TECHNIQUES**

PROJECT DIRECTOR: *Lenard R. Troncale, Coordinator, Institute for Advanced Systems Studies, CSPU, Pomona*

The project, begun in 1972-73, aims to implement a rigorous Bachelor of Science curriculum in Multidisciplinary Techniques, capable of graduating a proportion of entering students in three years. The project makes full use of media and the computer instruction.

TITLE: Small College Program — **MULTIDISCIPLINARY**

PROJECT DIRECTOR: *Barbara Chrispin, Director, Small College*

The project provided for the program development and evaluation of the Small College model program in which some students may obtain the baccalaurate in three years. The Small College opened in fall 1972 and enrolls approximately 250 students. Several students have graduated from the program with time-shortened programs. Others will be graduating in June 1975.

TESTING MODES OF INSTRUCTION

TITLE: Human Development Program: A Comprehensive Curriculum and Evaluation Systems — **HUMAN DEVELOPMENT**

PROJECT DIRECTOR: *Ivan D. Kovacs, Professor, Human Development CSU, Hayward*

This project undertook the development of several approaches to fulfill the objectives of an interdisciplinary undergraduate Human Development program. These approaches were the development of sets of modularized, mini-courses with built-in time flexibility, multiple alternatives in delivery and evaluation systems, and comprehensive exams. Policy research and skill training for students, faculty and members of the community will further the development of new approaches to deal with individual and cultural differences. Modules are available for use by students and faculty. A learning center open day and night is a feature of the project which is being implemented on the Hayward campus.

TITLE: Optimizing Effectiveness of the Discussion Method — **DISCUSSION TECHNIQUES**

PROJECT DIRECTOR: *William F. Hill, Professor of Behavioral Science, CSPU, Pomona*

The discussion method of college instruction has not been subjected to rigorous evaluation. This project investigated the effectiveness of the Learning Thru Discussion (LTD) method in classes representing different disciplines, by varying student composition of discussion groups according to interpersonal-interaction preferences based on GPA, sex and minority group status. The LTD method is used in groups, with discussion sessions monitored, selected sessions tape-recorded, and LTD training film video-taped from an actual group session of an optimally-composed group. The method is in use in several sections at Pomona.

TITLE: A Bi-Cultural Approach to Communications Skills — **ENGLISH**

PROJECT DIRECTORS: *Wacira Gethaiga, Associate Professor, Afro-Ethnic Studies, and Priscilla Oaks, Associate Professor, English, CSU, Fullerton*

Students in this project, drawn from different cultural backgrounds, learn communication skills in English composition through the production of a book created out of material drawn from the oral traditions of the Santa Ana ghetto community. Team teaching and peer group teaching techniques are utilized.

TITLE: Peer and Video Instruction for Development of Skills in Acting and Pantomime Courses — **DRAMA**

PROJECT DIRECTOR: *James O. Costy, Coordinator of Drama, CSU, Hayward*

This project aims to test if it is possible to handle large numbers of students in pantomime and acting courses, which traditionally are restricted in size, without a loss of instructional quality. Undergraduates serve as peer instructors to small groups of students whose work will be recorded on videotape and played back to evaluate success or failure.

TITLE: Program for Teaching Mastery of Engineering Mechanics — **ENGINEERING**

PROJECT DIRECTOR: *J.L. Meriam, Professor of Mechanical Engineering, CPSU, San Luis Obispo*

The project aims to develop a comprehensive course in engineering mechanics which will improve the student's comprehension and self-reliance and increase student-faculty interaction. The course is under pilot testing in 1974-75, using a combination of learning strategies including PSI.

TITLE: Individualized Large-Group Instruction Diagnosis/Prescription

CHEMISTRY

PROJECT DIRECTOR: *Grant D. Venerable, Assistant Professor of Chemistry, CPSU, San Luis Obispo*

Begun in 1973, the project applies Braithwaite's Multi-Processing Methodology to the instruction of freshman general inorganic chemistry. This methodology is designed to individualize instruction of large groups without the use of tutors, to develop technical competence and to spur intellectual growth. The project will be expanded this year to instruct other faculty in the methodology for use in their classes. Evaluation of the methodology will include a comparison of the student responses to the model with those from traditional methodologies. Finally, a prototypic, computerized, diagnostic/prescriptive instrument will be developed and evaluated.

TITLE: Interdisciplinary Games for Social Science, General Education

SOCIAL SCIENCES

PROJECT DIRECTOR: *Marilyn Garber, Associate Professor and Department Chairperson of History, CSC, Dominguez Hills*

A series of courses will be developed in the form of games or simulations involving interdisciplinary analysis. The director envisions a series of games eventually large enough to cover the general education requirements in the social sciences. Initially, games will be developed in history and sociology, and in the spring quarter, another subject area, either psychology or economics, will be included. Faculty workshops are also planned.

TITLE: Evaluation of Two Modes of Instructions vs. the Lecture-Discussion Mode: A Controlled Experiment

BUSINESS

PROJECT DIRECTOR: *Charles E. Swanson, Professor of Marketing, CSU, Fresno*

The objectives of this experimental project were to test the cost benefits of programmed educational television, including analysis of motivation, behavior, achievement criteria, and classroom time; and to test the cost benefits of a system of continuous evaluation utilizing a number of education media with weekly tutored testing of analytical concepts. An aspect of the project utilized 49 thirty-minute films and programmed instruction. A continuous evaluation system was developed, evaluated, and revised with problem-solving, reinforcement, tutors and weekly evaluation. On the basis of project results, a modularized program with continuous testing was adopted for use. The televised course did not prove satisfactory on the basis of student performances or student reactions.

TITLE: Designing an Instructional Message
PROJECT DIRECTOR: *Patrick O. Marsh, Professor, Communication Studies, CSU, Sacramento*

CONTENT OF INSTRUCTION

This project developed data for different student populations to make it possible to adjust the degree of sophistication of the material presented in a course to the ability of the group to be served. When the results of this study are applied, it is hoped that the level of complexity of the material presented will be congruent with the students' abilities to absorb it most effectively. It is expected that drop-out rates should be reduced significantly as those who have been bored by overly simplistic presentations and those who have been overwhelmed by too complex materials will find their abilities more closely approximated to course demands. A mediated presentation of the project findings is being developed. A monograph will be available in spring 1975.

TITLE: Small Group Peer Instruction
PROJECT DIRECTOR: *Ralph M. Goldman, Professor of Political Science Department, San Francisco State University*

POLITICAL SCIENCE

The objective was to evaluate a four-year experiment in the organization of large classes into small study groups. Students participated systematically and actively in their mutual instruction and in grading the performance of individual and collective tasks set forth in specially formulated syllabi. The pilot program included: (1) collecting and analyzing questionnaire data in a series of classes, using the experimental peer-instruction approach and comparing it with the traditional lecture-discussion method; (2) reporting the procedures of peer-instruction for utilization in a variety of disciplines; (3) preparing training materials for faculty. Results have been published in scholarly journals.

TITLE: The Development of a Mentorship Teaching Model
PROJECT DIRECTOR: *Frank R. Siroky, Professor of Psychology, CSC, Sonoma*

MULTI-DISCIPLINE

The project was developed by several faculty who, within the funding period in 1972-73, designed a substantial part of the programs in several discipline areas on the mentorship model. Partial success was achieved in the psychology aspect of the pilot.

MEDIATED INSTRUCTION EMPHASIS

TITLE: Audio-Tutorial: Art History — **ART**
PROJECT DIRECTOR: *Kathleen Cohen, Associate Professor of Art History, San Jose State University*

The pilot project offers a new method of teaching one of the basic survey courses in art history. The method combines the use of a series of outstanding films on the history of art with individual study using the audio-tutorial technique of audio tapes and film strips, and weekly small group seminars which bring together ideas and questions gathered throughout the week. The project's materials will be used at Pomona and Dominguez Hills as well as at San Jose.

TITLE: Comparative Modes of Instruction – Bibliographical Aids for the Social Sciences — **SOCIAL SCIENCE**
PROJECT DIRECTOR: *Robert G. Comegys, Professor of History, CSU, Fresno*

The project compared the lecture-discussion method of teaching social science bibliographic aids and scholarly references with: a) an audio-visual presentation of information without follow-up discussion and questions; and b) audio-visual presentation of information with follow-up discussion and questions. The project provides a model for replication in the natural sciences and the humanities, and for more specialized disciplines in which bibliographic aids, library usage, and reference tools are important. The project materials are in continuous use at Fresno.

TITLE: Resource-Oriented Instruction in Speech Communication — **COMMUNICATIONS**
PROJECT DIRECTOR: *Floyd Greenleaf, Associate Professor of Speech Communication, San Jose State University*

The primary objective of the pilot project was to develop a multi-faceted beginning course in speech-communication. This course utilizes the students and faculty from four traditional classes. Modular learning units are offered in two- or three-week periods. A resource center designed to meet individual student interests and needs is a feature for the project which continues to serve over ten faculty and multiple course sections.

TITLE: Self-Paced, Programmed Instruction in Musical Ear Training — **MUSIC**
PROJECT DIRECTOR: *Daniel A. Kessner, Assistant Professor of Music, CSU, Northridge*

This pilot project provides the music student with the basic ear training skills necessary to a college or university music program. A series of short audio tape recorded lessons with an

accompanying manual have been developed. Each lesson allows the student to work at his own pace and to explore a specific phase in the development of the skills necessary for the aural comprehension of basic musical structures.

TITLE: Specification of Graphics Language Requirements and Software Development of Computer Graphics for Inter-Disciplinary Use — **COMPUTER**

PROJECT DIRECTORS: *Clement Luk and Grace C. Hertlein, Assistant Professors of Computer Science, CSU, Chico*

The project leaders will use art and computer-aided design as the initial vehicle for defining a graphics system. Software will be developed in art and later adapted to interdisciplinary uses. The research, software and techniques of the project will be disseminated throughout the system for use by students and faculty.

TITLE: Instructional Development Support Project — **MULTI-DISCIPLINE/ INSTRUCTIONAL DEVELOPMENT**

PROJECT DIRECTOR: *Ron J. McBeath, Director, Instructional Development Services and Instructional Resources Center, San Jose State University*

This project provided a means to assess the value of a college-wide Instructional Development Service to coordinate and guide faculty instructional development projects in a systematic manner. The procedure involved use of services of a qualified instructional designer to work with each of several faculty project directors to: (1) develop statements of specific instructional objectives; (2) select appropriate methods, resources, and activities for teaching and learning to achieve these objectives; (3) develop appropriate measurement instruments and other suitable means of evaluating the extent to which objectives are achieved; (4) as appropriate, revise, improve, and recycle instruction to reach planned student attainment levels; (5) implement full-course application.

The emphasis in this project was to move from traditional modes of instruction to other more innovative approaches that provide students with greater opportunities for individualized learning, increased student self-reliance and more efficiency in instructional programs. Other instructional modes, such as large group presentations and small group interaction were also utilized. Four courses were encompassed within the project: art, mathematics for elementary school teachers, electrical engineering and speech. Art and speech projects are listed separately.

TITLE: Development, Use and Evaluation of Instructional Television Program. Modules of Essential Nurse/Patient Behaviors to Accelerate and Improve Student Learning in Nursing

NURSING

PROJECT DIRECTOR: *Donel W. Price, Director of Broadcast Service Center, CSU, Los Angeles*

This project's objectives were to accelerate student learning and increase the number of students a faculty member teaches by the use of instructional television program modules on a self-learning basis, to improve student learning and to increase efficiency of clinical portions of nursing courses. The project encompassed the production of 30 instructional television program modules of varying lengths of time for use in a wide variety of nursing courses. The video materials are in use in self-paced learning programs at Los Angeles and are part of the 14 campus curricular materials exchange program in nursing.

TITLE: Project SPIRIT

MULTI-DISCIPLINE/ VIDEO

PROJECT DIRECTOR: *Donald N. Wood, Professor, Department of Radio-TV-Film, CSU, Northridge*

Funded in 1972-73 and 1973-74, the project developed four televised courses in art, engineering, radio-TV and geology. The video materials were placed on cassette and a self-paced, modularized program organized. The four courses are continuing to be offered on the campus and have resulted in some savings of faculty time and physical space. The geology aspect has led to an inter-campus effort to develop additional course materiai.

TITLE: Earth Sciences Curriculum Development Consortium

EARTH SCIENCE

PROJECT DIRECTOR: *Peter J. Fisher, Professor of Geology, CSU, Northridge*

As outgrowth of the Northridge-based SPIRIT project, this inter-campus project is developing a number of videotapes for use in several types of lower-division courses in earth science. Fullerton and Long Beach are the other participating campuses.

TITLE: Production of Television Course in Art Appreciation and Development of Learning Modules for Course Laboratory Sessions

ART

PROJECT DIRECTOR: *Royd Weintraub, Director, Instructional Media Center, CSU, Chico*

The project provided mediated course and learning modules for use locally in a statewide system of distribution. It attempts to insure maximum use of valuable instructors through cooperation between the state university and community college districts,

reduces student time spent in college classrooms and laboratories and enhances student involvement and course content by bringing outside experiences to each lesson. The project involved production of approximately sixteen 30-minute ITV lessons for 16 lab sessions. It permits increased cost effectiveness; self-pacing; and more effective utilization of faculty in presenting an art appreciation course. The materials are in use at Chico and their use by surrounding community colleges is likely.

TITLE: Competency Programming in Special Education, ITV — **SPECIAL EDUCATION**

PROJECT DIRECTOR: *Katherine Butler, Chairperson of Special Education, San Jose State University (now Associate Dean, School of Education)*

The project over a two-year period developed over 40 hours of videotaped observations together with study guides covering the generic core in Special Education. The project in 1974-75 has been extended to include all campuses in the system offering special education programs. These campuses are using the videotapes and supporting materials in their own courses. A monograph on the project will be available in spring 1975.

TITLE: Experiential Instructional Mode — **HISTORY**

PROJECT DIRECTOR: *Gene L. Dinielli, General Honors Program, CSU, Long Beach*

This project explores the potentials of the experiential mode of course instruction developed and used in the General Honors Program, and will communicate the product of this experiment to faculty members on the local campus and throughout the system. Instructional "packages" and supportive materials, involving multi-media approaches, will be prepared. A book on the program is also being written by participating faculty.

TITLE: Computer-Augmented Learning and Illustrating Facility (C.A.L.I.F.) — **COMPUTER**

PROJECT DIRECTORS: *Lenard R. Troncale, Assistant Professor and Director of the Institute for Advanced Systems Studies, and Richard Hermsen, Professor and Chairman of the Electronics Engineering Department, CSPU, Pomona*

The aim of the project is to design and deliver a facility for computer-augmented training in learning skills, whereby students will design strategies of inquiry, organization and testing of subject matter. The project will be tested and evaluated in selected undergraduate courses in five departments, comparing C.A.L.I.F.-mediated and non-C.A.L.I.F.-mediated sections of the same course. It is also hoped that C.A.L.I.F. will aid in updating

and developing subject matter in specific areas, that it will ease cross-referencing concepts between disciplines and schools, and that it will provide a stimulus for student creativity through the correlation of subject matter with contemporary problems.

TITLE: Programmed Self-Instruction to Prepare Students for Classroom, Laboratory Work in Immunology and Virology — **BIOLOGY**

PROJECT DIRECTOR: *Karl T. Kleeman, Assistant Professor of Biology, CSU, Fresno*

The project will develop short audio-cassette lessons specifically designed to prepare students for laboratory work in the areas of immunology and virology. The project will test the concept that students, by reviewing materials in programmed, self-paced format, prior to attending their laboratory classes, will be able to do their lab work with a more efficient use of time, materials, and space, while showing an increased understanding of their work.

FACULTY DEVELOPMENT

TITLE: Faculty Development: School of Business — **BUSINESS**

PROJECT DIRECTOR: *Paul T. Kinney, Dean, School of Business, CSU, Chico*

The project emphasized the faculty development and improvement in instructional programs on a school basis. The program focused on two dimensions of the faculty development process: 1) development and utilization of individualized instructional programs tailored to faculty needs; and 2) refinement of performance measurement and identification of the directions and magnitude of performance change. The School of Business faculty were also introduced to multi-media and computerized instructional processes, and actively participated in the campuswide redefinition of educational goals. The result of the project has been a heightened awareness of alternative instructional modes and establishment of PSI courses. Experimentation with faculty growth contracts was not conclusive.

TITLE: An Instructional Development Program for University Professors — **FACULTY DEVELOPMENT**

PROJECT DIRECTORS: *Trevor Colbourn, Vice President for Academic Affairs, and Shirley Rush, Assistant Vice President, San Diego State University*

The 1974-75 project will establish an instructional development program to identify individual faculty who are interested in pursuing innovation. Emphasis will be placed on those faculty working with a substantial number of students. They will be

assisted in the use of strategies and technologies such as individual study centers, television, computer-assisted instruction, programmed instruction and simulation.

TITLE: Cadre Development of Faculty — **FACULTY DEVELOPMENT**
PROJECT DIRECTOR: *Phyllis I. Bush, Dean of Learning Resources, CSU, Chico*

The 1974-75 project will develop a series of three-member teams who will mediate specific modules. The development of such cadre groups in the faculty will focus on: media development in current programs, e.g., introductory courses in basic skills; media development in new areas using new approaches, e.g., small modules dealing with art-science interrelationships; and the formation of instructional design teams to take advantage of the great diversity of faculty expertise and technical support staff. Faculty completing the first phase of the project will help train others in a second phase.

TITLE: Computer-Based Curricula Interchange — **COMPUTER**
PROJECT DIRECTOR: *R. Gene Geisler, Associate Director, CSUC, Information Systems*

The objectives of the pilot project were to improve instruction through the development of a model and a strategy for the full systemwide curricular utilization of the existing timesharing computing network and to encourage the development and dissemination of computer-aided instruction materials. The program released faculty to offer seminar/workshops for the presentation and explanation of materials in specific courses. The seminar/workshops were attended by colleagues from CSUC who teach the same or similar courses in the traditional manner and are interested in expanding student instruction through the computer. The pilot project also tested methods for training faculty in new techniques of instruction using the computer. The result was increasing faculty understanding of and use of the computer.

TITLE: Departmental Chairmen Development — **DEPARTMENT CHAIRMEN**
PROJECT DIRECTOR: *C. Mansel Keene, Vice Chancellor, CSUC, Faculty and Staff Affairs*

The goal of this project, a pilot effort in 1972-73, was to upgrade the level of leadership and administrative expertise exercised by department chairmen and other staff by means of training

programs to develop professional skills and administrative effectiveness in the area of faculty evaluation. This project had two components, each consisting of workshops staffed by members of the California State University, Long Beach Counseling Center and from the Fullerton faculty with special expertise in various styles of leadership development. Similar activities are now being conducted under system sponsorship.

TITLE: Career Development Institute — **FACULTY DEVELOPMENT**
PROJECT DIRECTOR: *James N. McClelland, Dean of Instructional Services, CSU, Long Beach*

The objective of this project was the development of new formats for the study, research and teaching of new instructional and evaluation methods. A mini-institute was held for selected California State University, Long Beach faculty on effective and innovative teaching techniques. Continued evaluation of a 1972 Summer Career Development Institute, co-sponsored by The California State University and Colleges system and California State University, Long Beach, and funded through the federal N.P.D.A. program, provided perspective on the extent to which innovative teaching techniques learned at this Institute have been introduced on systemwide campuses. The project also established a center for the compilation and annotation of the rapidly developing sources of information on teaching techniques. Located on the Long Beach campus, this resource center is available to other campuses. The Center continues in operation, sponsoring a number of activities for faculty.

TITLE: Center for Professional Development — **FACULTY DEVELOPMENT**
PROJECT DIRECTORS: *Jerry Gaff and Clare Rose, Office of the Chancellor*

The Center, organized in 1974, supported through the Program and a federal Fund for the Improvement of Postsecondary Education grant, works with six campuses in developing model faculty and professional development programs.

REDUCTION OF ATTRITION

TITLE: Learning Assistance Support System (LASS) — **LEARNING ASSISTANCE CENTERS**
PROJECT DIRECTOR: *Frank L. Christ, Coordinator of Learning Assistance, CSU, Long Beach*

The primary aim of LASS is to mobilize existing campus and community resources in order to make them readily accessible to students as aids to learning. Emphasis is on the need to develop skills and attitudes which will facilitate learning. Another facet of the project is to assist faculty and administrators from all CSUC campuses to identify and develop self-paced learning assistance

programs. This project was first implemented in fall 1972 under a 1972/73 innovative grant, and operates from a central on-campus facility. It has served as a model program for the system as other campuses have begun development of such centers.

TITLE: Academic Advising Models for Innovative Instruction Based on Student Characteristics — **ADVISEMENT**

PROJECT DIRECTOR: *David C. Cohen, Associate Professor of Psychology, CSC, Bakersfield*

This project investigates the relationships between various student characteristics (demographic, personality, attitudinal academic) and learning in both traditional and innovative instructional formats. Advising models then will be developed to assist students in selecting course formats best suited to their needs and abilities. It is anticipated that this will result in a reduction in course withdrawals and incompletes and will increase student satisfaction and achievement. The project will encompass self-paced courses offered at the college during 1974/75, and an appropriate selection of control and comparison courses.

TITLE: I.D.E.A. — **ADVISEMENT**

PROJECT DIRECTORS: *Roger L. Bailey, Test Officer, and J. Richard Arndt, Coordinator of Tutorial Services, Department of Student Affairs, CSU, Fresno*

Project I.D.E.A. is a derivative of four components of the project: Identification, Development, Evaluation and Assignment. I.D.E.A. is designed to make constructive use of data which are available during a student's senior year of high school, including performance on the scholastic aptitude test (SAT), as well as self-reports of high school performance, extra-curricular activities and academic skill areas in which the student feels the need for assistance. The project will respond to these self-reported needs of students by offering suitable instructional programs, while increasing the student's awareness of learning experiences at Fresno relevant to his particular developmental goals.

TITLE: Stop-Out — **ADVISEMENT**

PROJECT DIRECTORS: *W. Donald Albright and Laurie L. Labbitt, Counselling Center, CSU, Fresno*

This project is designed to study and evaluate methods of providing continuing instruction and instructional-related services to undergraduate students who interrupt their educational progress. The project is based on the premise that the University has the necessary resources to assist these stop-out students to relate more fully their non-campus experiences to their educational-vocational goals. The results of this project could provide the basis for developing a new role and dimension to the

educational responsibilities of institutions in the State University and College system.

NEW USES OF TIME AND FACILITIES

TITLE: Alternative Approaches to General Education — **GENERAL EDUCATION**

PROJECT DIRECTOR: *Julian F.S. Foster, Professor of Political Science, CSU, Fullerton*

One of the aims of the project was to create a major new strand in General Education, focusing on relevant topics rather than an introduction to the disciplines. Under the initial funding in 1972/73, emphasis was on the development of mini-courses as an alternative approach to general education requirements. These courses carry one unit of credit and are offered in non-traditional time frames. Mini-courses are now offered as a regular part of the Fullerton curriculum. Forty-three are being offered in spring 1975.

TITLE: Project Overlay: Concurrent High School/College Education — **HIGH SCHOOL TO COLLEGE**

PROJECT DIRECTOR: *Rhody Ringis, CSC, Dominguez Hills*

The program enabled a design team to explore educational alternatives, successfully combining the twelfth and thirteenth years of school into one concurrent academic year. Several model programs were considered and tested. A comprehensive report on the project is available.

TITLE: The Weekend College — **MULTI-DISCIPLINARY**

PROJECT DIRECTOR: *Robert K. Rheinish, Director, Learning Resources Center, CSU, Long Beach (Coordinator for Current Program)*

The objectives of the project were: 1) a curriculum innovation creating two introductory interdisciplinary classes (4 semester units each) for general education; 2) instructional innovation in the use of media to achieve curriculum development; 3) innovation in the utilization of facilities by using the college in a weekend program.

Scheduled on Saturday, the pilot Weekend College featured two lower-division core courses – "Explorations in Communications", and "Explorations in Cultural Creativity" – to serve as experimental models in interdisciplinary team-taught classes, each staffed by six professors, and to provide an orientation for students, through which they could discover possible directions for later study in the sciences, social sciences, humanities, and

communications. The initial project proved too costly to continue. The campus is now offering a modified Weekend College with the assistance of the Learning Resources Center.

TITLE: Community Access Education: An Open University — **MATHEMATICS**

PROJECT DIRECTOR: *Kenneth L. Jones, Professor, Telecommunications and Film Department, San Diego State University*

It was the purpose of the project to determine the efficacy of a method of instruction to provide a learning sequence to students in widely dispersed locations to accommodate disparate work schedules and life styles. This methodology, based on the "Open University" of Great Britain, was to be tested from pedagogical and economic viewpoints. The project was planned to utilize mediated instruction in mathematics encompassing a mix of correspondence, open-circuit television, radio, cable communication, telephone feedback and tutorials. The project was cancelled due to limited student interest and high costs. A residual effect remains in an active educational television consortium in the south coast area.

IMPROVEMENT OF EFFICIENCY

TITLE: Career Education Committee — **CAREER EDUCATION**

PROJECT DIRECTOR: *Thomas Graham, Dean of Continuing Education, CSU, Los Angeles*

The project provided support for the systemwide Career Education Committee in pursuing activities designed to: 1) enhance better faculty, placement and counseling knowledge of career opportunities related to the various academic disciplines, and more effective transmission of career information by faculty, placement officers and counselors to students; 2) institutionalize strong and permanent relationships between individual faculty members and the segments of the business, industrial and governmental community which provide career opportunities related to the various academic disciplines; 3) increase current valid career information for CSUC students relating to their academic goals, including occupational outlets for the Liberal Arts; 4) assist in initiation of contacts leading to development of credit-earning cooperative education components within appropriate curricula or programs; 5) facilitate exploration of steps for development of teacher-training programs that will prepare future teachers and in-service teachers for advising elementary and/or secondary students about career opportunities. A report and handbook have been published as a part of the committee's program.

TITLE: Center for Community Internships and Cooperative Education

PROJECT DIRECTORS: *Bernard L. Hyink, Professor of Political Science, and James G. Gallaher, Associate Director of Student Services, CSU, Fullerton*

MULTI-DISCIPLINARY INTERNSHIPS

Selected as a model pilot progaram for the system, the aims and objectives of this project are to expand the total educational program of the University by providing opportunities for students to integrate their formal academic training with practical work experience in the community. The three principal modes of instruction – courses with practicum, the internship program and cooperative education projects – will give both scope and depth to work experiences directly related to the student field of interest. College credit is given for such work.

The project tests an all-campus program to coordinate field activities. All discipline areas, including the humanities, will be encompassed. The University Center for Community Internships serves students and faculty in a program which will enhance the student's self realization and provide cultural learning situations outside the classroom environment. The Student Services program of the University is presently expanding its own educational involvement and is playing a significant role in the development of the Center. Over 800 students are participating in internships sponsored by 24 departments.

TITLE: Computerized Test Item Bank Implementation

PROJECT DIRECTORS: *Gene Geisler, Associate Director, Division of Information Systems, Office of the Chancellor; and Paul Black, Associate Professor of History, CSU, Long Beach*

COMPUTER

The project developed a system (SOCRATES) to place a computerized test item data bank system into full operation for benefit of all CSUC campuses by July 1975. Pilot projects funded in 1972/73 supported the preparation of test questions in science and mathematics. These items, when stored in the CSUC computer system, will thus be available for use by all CSUC faculty. A second aspect of the project will be a follow-up of faculty efforts to make more effective use of the computer in instruction. A beginning effort funded in 1972/73 included a number of workshops on the uses of the computer in specific disciplines. Other projects in 1974-75 have continued development by test item data banks and the perfection of the SOCRATES system. Related projects are listed immediately below.

TITLE: Mathematics Classroom Teachers Support System — MATHEMATICS

PROJECT DIRECTOR: *Charles R. Burton, Professor of Mathematics, San Diego State University*

The program sought to improve the quality of mathematics testing by creating a test bank of categorized questions for computer storage. This bank is used to construct, upon request, qualifying and performance tests for intermediate algebra. trigonometry and advanced algebra. The bank is being used at San Diego extensively and is available through the SOCRATES system.

TITLE: Development of a Computerized Data Bank of Test Items with Faculty Orientation for Use in Lower-Division Science Courses — SCIENCE/ GENERAL EDUCATION

PROJECT DIRECTOR: *Samuel S. Wiley, Associate Professor, Department of Physics, CSC, Dominguez Hills*

This project provides instructors in lower-division science courses with a bank of readily available objective questions for classroom tests, and trained a selected group of faculty in their application to frequent drills and diagnosis of student learning needs. Such an experimental approach may lead to improved instruction with significant cost savings. The test items, classified according to subject matter, are particularly useful in self-paced modular instruction and in the granting of advanced placement and course credit-by-examination. The test item bank is undergoing refinement and will be available to faculty on all campuses through the SOCRATES system.

TITLE: Inter-University Video Link — MULTI-DISCIPLINARY VIDEO

PROJECT DIRECTORS: *Robert Maurer, Dean, School of Professional Studies, and William Lane, Department of Computer Science, CSU, Chico*

The project contributed to the installation of a two-way video link to allow students to take courses with full classroom participation from faculty in other locations. Courses will be available on the video link Computer Sciences between a State University campus (Chico), a University of California campus (Davis), and a major university research facility (Lawrence Livermore Laboratory), and in the Allied Health Areas between CSU, Chico, and UC, Davis. The project also demonstrates the opportunities for sharing faculty resources between institutions at different locations. The grant was matched by UC, Davis. The system became operational in fall 1974 with courses planned for spring 1975.

TITLE: New Approach to Accreditation — **SELF-STUDY**

PROJECT DIRECTORS: *Robert L. Fredenburg, Associate Vice President for Academic Affairs and Jack Safarick, Director of Institutional Research, CSU, Chico*

This pilot project is designed to assess the University's progress toward attainment of its goals as stated in the University Academic Master Plan. This progress will be largely determined by measuring the effect of various programs on students, both as they graduate and later as part of a longitudinal study. The evaluation is being used by the Western Association of Schools and Colleges as a model for accreditation self-studies conducted by other institutions in the future. In 1974-75 alumni, student and faculty surveys are being carried out.

TITLE: Program for Faculty Exchange — **FACULTY EXCHANGE**

PROJECT DIRECTOR: *Statewide Academic Senate, CSUC*

This project was designed to determine the feasibility of establishing a systemwide procedure for stimulating and coordinating intercampus faculty exchanges and to determine the feasibility of limited funding for operation of a regularly established exchange program. A plan for long-term administration of the exchange program was prepared. The project has led to provision within the 1975-76 CSUC budget for administration of such a program.

TITLE: The Relation Between Student Evaluation and Learning — **TEACHING EFFECTIVENESS**

PROJECT DIRECTOR: *Mildred J. Massey, Professor of Economics and Statistics, CSU, Los Angeles*

In view of the increasing reliance on students' evaluations of faculty performance, the project assessed student evaluation of instructors in relation to student learning. Several introductory courses in business and economics given in multiple sections were used in the study, with controlled uniform subject content, comprehensive testing, and identical student evaluation instruments of instructors. Little relationship was found between the evaluation of instructors and grades received in the detailed study. An occasional paper on the study is projected.

TITLE: Assessment of Productivity in Engineering Schools — **ENGINEERING**

PROJECT DIRECTOR: *W. W. Happ, Dean of Engineering CSU, Sacramento*

The project was directed toward developing guidelines acceptable to faculty, CSUC administration and industry to assess the productivity of engineering instruction by measuring performance

of engineering programs, documenting obsolescence and cost-effectiveness, and providing an evaluation procedure acceptable to all concerned. The project has had impact on the management of the School of Engineering at CSU, Sacramento, but did not fully meet objectives designed to include other engineering programs in the application of project results.

APPENDIX G

MINI-GRANTS 1974-75

BAKERSFIELD

Coordinator: Thomas M. Watts

Pilot Study for the Preparation of a Collective Bargaining Seminar for Government Employees, *Richard Stillman, Associate Professor of Public Administration*

The Chicano Experience, *Ronald Dolkart and Gerald Stanley, Assistant Professors of History*

An Audio-Visual Course in Introductory German, *Carlos Lozano, Chairman of Foreign Languages and Professor of Spanish, and Phyllis Manning, Lecturer in German*

A Problem Oriented Course in Elementary Statistics, *Bryan Haworth, Assistant Professor of Mathematics*

CHICO

Coordinator: Phyllis I. Bush

Mobile Information Display, *Roger Anderson, Director of Admissions*

Computer Tapes for Transcript Data, *Jack Otto, School Community Relations Officer*

Computer Graphics of Geometry, Algebra for Multi-Variable Calculus, *Everett Riggle, Professor of Mathematics*

California Studies, *Gene Martin, Professor of Geology and Social Science*

DOMINGUEZ HILLS

Coordinator: Mary Ann Harp

A Learning Aids Projects in Support of Curriculum Courses, *William Hagan, Director of Special Projects; Associate Professor of Philosophy*

A Videotape Laboratory Instruction System, *Solomon Marmor, Acting Dean, School of Natural Sciences and Mathematics; Professor of Chemistry*

A Pilot Peer Tutoring Program, *Beverly Palmer, Assistant Professor, The Small College*

Modules for Individualized Instruction, *David J. Hudson, Coordinator of Audio Visual Services; Lecturer in Geography and Education*

Individualized Writing Resources, *Marilyn Sutton, Assistant Professor, The Small College*

FRESNO

Coordinator: Lillian Faderman

Project Senior Citizen, *Lyman Heine, Assistant Professor of Political Science*

Introduction to Independent Learning, *Dolores Kindell, Assistant Professor of Nursing*

San Joaquin Valley Farm Management Simulation Games, *Carl Pherson, Assistant Professor of Agricultural Economics*

Television System for Chemistry 2A, *David Frank, Assistant Professor of Chemistry*

Mini Projects in Microbiology, *Karl Kleeman, Assistant Professor of Biology*

Modules in Geology, *Warren Nokeberg, Assistant Professor of Geology*

FULLERTON

Coordinator, James D. Young

Self-Pacing Modules in Marketing Research, *Paul Hugstad, Associate Professor of Marketing*

Practitioner-Student Workshop in Management, *Tai K. Oh, Associate Professor of Management*

A Video Tape Package on the Competency of "Systematic Desensitization", *Marilyn Bates, Associate Professor of Education*

Competency based Tutorial Treatments for Math 100 and Their Relationship to the Academic Performance, Attitudes, Preference and Attrition rate of High Risk Students, *Dennis Fenton, Director of Learning Center*

Automated Slide Tapes for Individual Instruction, *Marvin J. Rosen, Professor of Communications*

Slide Tape Presentation of Speech and Language Development, *Arden Thorum, Assistant Professor of Speech Communication*

The Role of Affective Teaching Technics and Self-Grading on Student Self-Esteem and Motivation Towards Learning, *Bayard H. Brattstrom, Professor of Zoology*

Auto-Tutorial Instruction for Self-Paced Learning in the Use of Equipment and Instruments, *John Cooper, Associate Professor of Earth Science*

The Use of Native Wild Life in Development Teacher Training Methods in Environmental Education, *Barry Thomas, Assistant Professor of Science Education*

Self-Paced Programmed Learning in Environmental Protection and Evaluation, *Prem K. Saint, Assistant Professor of Earth Science*

Urban Science Inter-Teaching, *George C. Turner, Professor of Biology and Science Education*

The following Fullerton faculty will direct mini programs but the titles of their projects were not available:

Ernest Becker, Director of Placement Center and Professor of Philosophy

William Rubinstein, Professor of English, Kirk Mee, Associate Professor of Theatre, and Allen Zeltzer, Director of Instructional Media and Professor of Theatre

Gloria Castellanos, Assistant Professor of Mathematics Education

Jack Zahniser, Assistant Professor of Anthropology

Anne Feraru, Associate Professor of Political Science

Anne Feraru, Vera Simone, and Sandra Sutphen, Associate Professors of Political Science

John Brugaletta, Associate Professor of English

George Giacumakia, Professor of History

J. Michael Russell, Associate Professor of Philosophy

Barbara Stone, Associate Professor of Political Science

HAYWARD

Coordinator: Leigh Mintz

Improvement of Baccalaureate Clinical Nursing Instruction: Trail of a Modular Auto-Tutorial Approach

Dora E. Blackmon, Director of Nursing; Professor of Nursing

Equipment for Implementation of Courses in Film and History, *Lejeune Cummins, Chairman, Department of History; Professor of History*

Computer Simulation of the Evolutionary Process: New Learning Programs for Undergraduates, *Alan J. Almquist, Assistant Professor of Anthropology*

Auto-Tutorial Mini-Courses in the Biological Sciences, *Richard A. Symmons, Assistant Professor of Biological Science*

Theatre for Children — Designing the Setting, *Jeanne L. Hall, Professor of Speech and Drama*

HUMBOLDT

Coordinator: Peter Coyne

(Faculty names only available)

Martha Crowe, Assistant Professor, Education, and William Davey, Assistant Professor, Speech Communication

David Craigie, Associate Professor, Natural Resources (Biometry)

Vernon Klemin, Assistant Professor, Business Information System

Emilla Tschanz, Associate Professor, Home Economics (Child Development)

Charles Snygg, Assistant Professor and Charles Biles, Associate Professor, Mathematics

Donald Bowlus, and Dennis Musselman, Professors, Psychology

Katheleen Preston, Assistant Professor, Psychology

LONG BEACH

Coordinator: Jan Nevin

A Critical Analysis of Communication Variables in Consciousness Raising in Small Groups of the Women's Rights Movement, *Nancy E. Briggs, Assistant Professor, Speech Communication*

The Development of a General Education Geology Course Integrated with Laboratory and Self-Paced Formats, *John C. Dennis, Professor, Geological Sciences*

The Development of Modularized Maternity Nursing, *Charlotte Dunlap, Lecturer, Nursing*

The Development of Modularized Nursing Assessment, *Jean Dunworth, Assistant Professor, Nursing*

The Development of an Inter-Disciplinary Pilot Program for Training Students in the Theories and the Application of Behavior Modification, *Alice Harris, Assistant Professor, and Robert Kapche, Associate Professor, Psychology*

The Development and Evaluation of a Self-Paced Multi Media Learning Module of the Function, Responsibilities and Structure of Official Public Health Agencies, *Phyllis Lackey, Associate Professor, and Beth More, Assistant Professor, Nursing*

LOS ANGELES

Coordinator: Thomas Graham

Development of Reading Behavior Activity Packages, *Robert Pellant, Assistant Professor, and Norman Berke, Associate Professor, Education*

Self-Teaching Modules for the Geological Sciences, *Ivan Colburn, Professor of Geology*

Accounting and Data Processing Data Bank Development for SOCRATES System, *Robert Verkler, Assistant Professor and John Gessford, Associate Professor, Business Information Systems*

New Concepts in Engineering Corps Laboratory Instruction, *Philip Gold, Associate Professor of Engineering*

Self-Paced Instruction in Chemistry, *Joseph Casanova, Professor of Chemistry*

The Use of Films in Latin-American Studies, *Donald Bray, Professor of Political Science, Louis DeArmond, Professor of History, and Timothy Harding, Associate Professor of History*

The Role of Business in Modern Society, *John Steiner, Assistant Professor of Business Administration*

Development of an Individualized Program in the Teaching of Intermediate and Advanced Shorthand, *Marylynne Ward, Assistant Professor of Business Education*

Self-Learning Aids for the Coordinated Undergraduate Diatetic Program, *Pauline Schatz, Associate Professor of Home Economics*

Elementary Correlational Concepts and Techniques: Sound Film Strips, *Fred Pyrczak, Assistant Professor of Education*

The Development of Self Learning Modules in Nursing, *Kathleen McGuire, Lecturer, Nursing*

The Development of Instructional Modules for World Regional Geography, *Frederick H. Scantling, Associate Professor, Geography*

Inservice training in composition, *Robert C. Wilder, Department of English*

NORTHRIDGE

Coordinator: Harry Finestone

Interdisciplinary Program in Computer Technology and the Performing Arts, *Willard Bellman, Professor of Theatre and Gary Nelson, Dept. of Engineering*

A Multiple-Version, Computerized, Test-Generator System for Placement Examinations in Introductory Biology, *Kevin Daly, Associate Professor of Biology*

Proposal for New and Revised General Education Program for CSUN, *Heinrich R. Galk, Associate Professor of Theatre*

Coordinated Offering of English 155 and Philosophy 100, *William Forthman, Associate Professor of Philosophy*

An Aide Training Program in a Language Clinic Setting, *Elaine Hannah, Associate Professor of Communicative Disorders*

Project in American History General Education Course Offerings, *Sheldon Harris, Professor of History*

The General Education Program in Theory and in Practice: A Need for Revision, *Sidney Luckenbach, Associate Professor of Philosophy*

Self-Paced, Individualized, Machine-Directed Instruction in the Computational Tools of Physics, *Mortimer Moore, Professor of Physics and Astronomy*

Personalized Instruction and Computer-Aided Learning in Lower Division Physics, *Robert Park, Assistant Professor of Physics and Astronomy*

Graphic Design. 344 in the Art-2D Media Department, *Morris Zaslavsky, Assistant Professor of Art-Two Dimensional Media*

POMONA

Coordinator: Robert L. Maurer

Library-Use Instruction: Slide-Tape Presentation, *Thomas L. Welch, Librarian, Reader Services Librarian*

A pilot Project for the Development of a Modular Approach to the Teaching of Physical Principles Via Technical Applications, *Robert D. Eagleton, Associate Professor, Physics and Earth Sciences*

An Auto-Tutorial Approach to the Study of Plant Structures and Functions, *Raymond Z. Riznyk, Assistant Professor, Biological Sciences*

Personalized System of Instruction in General Physics, *James Kerwin, Assistant Professor, Physics and Earth Sciences*

Student Micro Computer, *Daniel J. Nesin, Associate Professor, Electrical and Electronics Engineering*

SACRAMENTO

Coordinator: Emmett C. Thompson

Computer-Controlled Graphical Displays, *W. K. Troka, Associate Professor of Physics, and Paul N. Noble, Assistant Professor of Chemistry*

Audio-Visual Tutorial: Great Occasions in English History, *Karl von den Steinen, Assistant Professor of History*

Integration of Career Development with Curriculum and Continuing Education, *Paul Huber, Professor, Albert Kowitz, Assistant Professor, and Leland Nichols, Professor, Communication Studies*

SAN BERNARDINO

Coordinator: Florence Weiser

Computer Assisted Instruction in Physical Chemistry, *Kenneth Mantei, Associate Professor of Chemistry*

Program to Teach the Legislative Process, *Carol Goss, Assistant Professor of Political Science*

Counselor Education, *Robert Senour, Assistant Professor of Education; Director of Audiovisual Services, Maria Senour, Assistant Professor of Education, Robert Eaton, Associate Professor of Psychology*

Program in Body Conditioning, *Carolynn Martin, Lecturer in Physical Education and Recreation*

Band for All Seasons, *Arthur Moorfield, Associate Professor of Music*

SAN DIEGO

Coordinator: Shirley Anne Rush

Puppet Theatre Company, *Margaret McKerrow and Merrill Lessley, Assistant Proressors of Drama*

Audio and Video Tapes for Student Playback, *Monica Murphy, Associate Professor of Elementary Education*

Competency-Based Composition Instruction, *John Linthicum, Leterature, and Guy Smith, Study Skills*

Preparation of Materials Suitable for Competency-Based Instruction, *John Weeks, Sociology*

Training Seminar for Native American Language Teachers, *Suzette Elgin, Linguistics*

Presentation of Affective Learning Activities Materials in a Workshop for Foreign Language Teachers, *Clay Ben Christensen, Assistant Professor of Spanish*

Test Bank for General Biology, *Vernon Avila, Lecturer in Zoology*

Dye Casting Project, *Doris Meek, Professor of Higher Education, Aaron Rasmussen, Industrial Studies, Phil Flemion, Assistant Profession of History, and Roger Cunniff, Associate Professor of History*

SAN FRANCISCO

Coordinator: Harold L. Einhorn

Programmable Calculators in Elementary Mathematics, *Arthur Hall, Professor of Mathematics*

Production, Implementation and Evaluation of Modules in Individualized Instruction in Media Competencies, *Marvin Silverman, Director, Educational Technology Center; Professor of Secondary Education*

American Cameos, *Joan De Sales Bertram, Professor of Theatre Arts*

Development of Independent Study Modules in Nutrition, *Juno-Ann Clarke, Associate Professor of Home Economics*

Computer Generated Economics Models, *Jack Osman, Department Chairperson, Economics; Associate Professor of Economics*

Personalized Instruction in Mathematics 126, *David Meredith, Assistant Professor of Mathematics and Hal Forsey, Associate Professor of Mathematics*

Innovation in Asian-American Studies, *Jim Hirabayashi, Dean, School of Ethnic Studies; Professor of Anthropology, and George Arak, Professor of Biology*

Life/Work Shop, *Alan Javurek, Counselor for Employment Resource Center*

Curricular Program in Environmental Studies, *Ruth Doell, Professor of Biology*

Audio-Visual Self-Paced Instruction, *Cameron Ainsworth, Department Chairperson; Chemistry, Professor of Chemistry*

East-West Art Forum, *Helene Aylon, Instructor in Art Department*

Faculty Inventory, *Eleanor Morrissey, Assistant Professor of Humanities*

SAN JOSE

Coordinator: Ronald J. McBeath

Validation of the Learning Effectiveness of Computer Simultion in Business 160 and 167, *A. M. El-Shaieb, Associate Professor of Business*

Individual Learning Modules for Stagecraft in Drama 50, *James R. Earle, Jr., Assistant Professor of Drama*

Learning Modules on Contemporary Issues in History 100, *Louis R. Bisceglia, Associate Professor of History*

Program Development in the Center for Asian Studies, *George E. Moore, Professor of History*

Development of Lab Manual for Chemistry 117 in New Nuclear Science Facility, *Gerard Palino, Assistant Professor of Chemistry*

Learning Modules on Vacuum Forming Prepainted Thermoplastics, Art 114, *R. E. Griffith, Associate Professor of Art*

Programmed Self-Study Course in Japanese Ideographs for Japanese 1A through 101B, *Chaote Lin, Associate Professor of Foreign Languages*

Competency Based "Pilot Study" in Secondary Education, *Lawrence Pugano and John Wright, Professors of Secondary Education*

SAN LUIS OBISPO

Coordinator: David Grant

(Names only available)

Allen K. Settle, Political Science
George Mulder, Director, Counseling and Testing
Don Morris, Associate Dean, Continuing Education
Clyde Hostetter, Audio-Visual
Herschel L. Apfelberg, Graphic Communications
Robert Levinson, Education
Daniel E. Krieger, History

SONOMA

Coordinator: Ella M. Trussell

Unit Summary Lectures – Sound Movie Format, *James B. Gale, Associate Professor of Physical Education*

Teaching and Curriculum Innovation in Lower Division Biology, *David Hanes, Associate Professor of Biology*

Theory Simulation and Practicum, *Barry Godolphin, Assistant Professor of Psychology*

Curriculum Design for Staff Development in Bilingual Instruction, *H. Andrea Neves, Assistant Professor of Mexican-American Studies*

Social Values and American Cultural Change, *Donald Dixon, Assistant Professor of Political Science*

STANISLAUS

Coordinator: Curtis R. Grant

Foreign Language Learning and Resource Center, *Robert K. Anderson, Assistant Professor of Spanish and Michael C. Fuller, Assistant Professor of French*

Curriculum Development in Lifetime Sports Activities, *James Bowen, Assistant Professor of Physical Education*

Auto-Tutorial Project in Biological Science, *Judith Brown, Assistant Professor of Biological Sciences*

Instructional Use of a Scale Model Stage in Drama, *Noble T. Dinse, Associate Professor of Drama*

Stanislaus Center for Individualized Instruction, *Thomas A. Gentry, R. Frank Wallace, Gary D. Novak, Assistant Professors of Psychology, and Susan E. Kellogg, Assistant Professor of Speech Pathology and Audiology* ■

APPENDIX H

Summary Data, Fund for Innovation and Improvement 1972-75

1972-73	
Appropriated, Item 292	$1,428,720
Additional faculty positions allocated (21.4 F.T.E.F.)	267,768
Salary Increase Funds	91,900
Total Available	1,788,388
Total Allocated	1,732,656
Projects	(1,620,586)
Administration	(112,070)
1973-74	
Appropriated, Item 325	$1,282,639
Salary Increase Funds	53,982
Adjustments	−28,439
Total Available	1,308,182
Total Allocated	1,308,022
Projects	(1,172,327)
Administration	(135,695)
1974-75	
Appropriated, Item 363	$1,401,248
Salary Increases and Benefits	78,720
Adjustments	−4,914
Total Available	1,475,054
Total Allocated as of Dec. 1974*	1,379,886
Projects	(1,218,548)
Administration	(161,338)
(Credit-by-Examination appropriation, Support Budget	(134,135)
1975-76	
Proposed	$1,111,497
Tentative allocations	
Inter-campus projects	525,000
Mini-grant program	207,500
Credit by Examination	150,000
New Areas for Innovation	128,997
Evaluation and Dissemination	100,000

*Additional allocations made since December 1, 1974 through January 31, 1974, total $39,178. These allocations are not reflected in other Appendices.