DOCUMENT RESUME

ED 056 657   HE 002 657

TITLE   Development and Experiment in College Teaching, No.
                7.
INSTITUTION   Committee on Institutional Cooperation.
PUB DATE   71
NOTE   55p.
AVAILABLE FROM Stanford C. Ericksen, Director, Center for Research
                on Learning and Teaching, 109 E. Madison Street, Ann
                Arbor, Michigan 48104 ($.50)

EDRS PRICE   MF-$0.65 HC-$3.29
DESCRIPTORS   *Educational Development; Educational Experiments;
                Experimental Programs; *Experimental Teaching;
                *Higher Education; *Innovation; Teaching Methods;
                *Teaching Procedures

ABSTRACT
                This report comprises a collection of summaries of
exploratory efforts by college professors at the Committee on
Institutional Cooperation member institutions to develop new and
better ways of teaching. Usually these are local experiments aimed at
improving the conditions for learning in a specific subject-matter
area, but many of the procedures can easily be generalized for
application in other departments, or they may stimulate the search
for fresh alternatives. The subject-matter areas are: agronomy,
animal science, counseling, engineering, home economics, industrial
management, medicine, journalism, language, mathematics, music,
philosophy, and psychology. University-wide activities summaries fall
into the categories of administration and academic facilities,
interdisciplinary program, measurement and evaluation, and teaching
assistants. Cumulative indexes by subject matter and category are
included. (LS)

Development and Experiment

In College Teaching

A compendium of reports
on educational experiment and development
in the disciplines and professional schools
at 11 Midwestern universities
Prepared and distributed by the
CIC Committee on Research and Development
of Instructional Resources

REPORT No. 7   1.   SPRING 1971

The Committee on Institutional Cooperation (CIC)
was established in 1959 by the Big Ten
Universities and the University of Chicago
to facilitate pooling of resources and
talents on matters of mutual concern
in higher education.

Development and Experiment in College Teaching

No. 7

Spring 1971

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Foreword

This report comprises a collection of summaries of exploratory efforts by college professors at CIC institutions to develop new and better ways of teaching. Usually these are local experiments aimed at improving the conditions for learning in a specific subject-matter area, but many of the procedures can easily be generalized for application in other departments, or they may stimulate the search for fresh alternatives.

The Committee regards the teacher as the primary audience for this series of reports and therefore most of the items fall under Section I: Subject-Matter Areas. The second section, University-Wide Activities, includes descriptions of institutional facilities, instructional media arrangements, and broad progr   which span the disciplines. Section III is the cumulative index to all five published reports by subject area. Section IV is a cumulative index by categories which appears in this issue for the first time. The categories for this new index were suggested by the abstracts in the first five issues and are therefore somewhat arbitrary; the index itself is designed to make the series of reports more useful to readers.

This report will serve its purpose if it provides a useful exchange of information between college teachers. These are no "instant teach" solutions; attempts to improve instruction demand considerable responsibility on the part of the subject-matter specialist -- the individual teacher -- who might wish to adapt them to his particular area and purpose.

Copies of all Reports are available free of charge to faculty of CIC : titutions and should be requested directly from institution representatives (se: ,   io . others who are interested, copies are available from the address below at a cost of $.50 each to cover mailing and handling expenses.

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of Instructional Resources

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I. Subject-Matter Area

ART

New Seminar Approach to Ancient Art History

A major research and development effort, jointly sponsored by the Art History De-
partment, Programmed Learning Center and Human Learning Center of the University
cf Minnesota, is directed toward new approaches to learning and evaluation in an
introductory course in ancient art history through a seminar on teaching and learning
in art history. Participants during the past year have included faculty members and
graduate students from art history, psychology and educational psychology; represen-
tatives from various University resource units such as audio-visual services, television,
computer-assisted instruction and library have participated regularly or on an on-call
basis. While ultimate concern of the seminar is the teaching and learning of art
history, many questions have been raised which have generated research studies by
psychologists on cognitive and perceptual learning issues and by educational psycho-
logists on the evaluation performance and instructional techniques and strategies.
The major effort of the seminar is to develop better descriptions of the structure of
knowledge of art history and to develop performance criteria which reflect the con-
cepts and "conceptual abstractions" making up that structure.

Eight volunteer students selected from the regular art history course provide a labora-
tory for the pilot testing of materials and techniques. As feasibility data are gathered
in the special laboratory section and evaluated in the seminar, materials and techniques
are introduced in the regular course. Similar instructional research and develop-
ment projects and seminars have been initiated in anthropology, English composition,
and music theory.

For further information on the studies, seminar topics and data gathered contact
Professor Shelia McNally, D: partment of Art History, 209 Jones Hall, University
of Minnesota, Minneapolis, Minnesota 55455.

BIOCHEMISTRY

Developing the Knowledge Domain for Teaching Metabolism

During the past two years, a description of the domain of metabolism has been
developed for the biochemistry course for veterinary medical students at the Univer-
sity of Minnesota. Earlier the course presented the various metabolic pathways,
reaction by reaction, made generalizations and interpretations based on entire
metabolic pathways, made correlations among pathways, interpreted these, and dis-
cussed species differences with emphasis on the ruminant. Evaluation was often a
matter of simply determining whether all major areas of the subject material had
been included and whether the performance criteria clearly stated what was expected
from the student. Performance criteria were evaluated on the basis of their

contribution to: developing the basic knowledge required by veterinary medical students and graduates (as opposed to biochemists) for solving problems involving metabolic phenomena; providing a compact structure that can be modified and expanded by advances in the knowledge of metabolism after the period of formal training of the student to be of value in continuing education.

The subject matter of metabolism was reviewed, information and the core was selected that would be essential for solving common metabolic problems for constructing a framework of knowledge in the domain of metabolism. The framework for metabolism actually developed consists of performance criteria and simplified metabolic charts. The charts, however, form the core material from which students work rather than summary or incidental aids. Further learning involves manipulation of and elaboration on the initial small and relatively easily acquired structure.

Half of the lecture time in the course has been cancelled and the time devoted to small group discussions in which the students work with and perform transformations on the knowledge. During the coming year taped discussions will be provided for each metabolic chart to allow students to review. Testing emphasizes utilization and manipulation of knowledge in metabolism, particularly the student's ability to generate novel responses or new information based on knowledge acquired within the domain rather than recall of bits of information.

The students now tend to give less stereotyped responses to questions about metabolism and they perform transformations on their smaller pool of information more readily.

For further information contact: Professor Everett Short, College of Veterinary Medicine, Temporary, East of Haecker, University of Minnesota, Saint Paul, Minnesota 55101.

CHEMISTRY

Computer-Based Teaching of Organic Chemistry

Programs for teaching an introductory course in organic chemistry have been developed for the PLATO computer-based teaching system. Information consisting of images selected from slides and superimposed computer and student controlled graphics is displayed on individual television screens. Students control their own progress throughout the lesson.

In one lesson sequence, for example, the student can explore the reaction of a representative ketone with bromine and base by specifying the suitable reaction conditions. The computer responds with a plot of per cent yield vs. time for the specified conditions. Any number of simulated experiments may be carried out. However, before he may proceed with new material, the student must correctly answer detailed questions about the reaction. If he is unable to do so, experiments are suggested which, when properly interpreted, will enable him to answer the questions.

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A program in which students can approach problems in an individual way is illustrated by an aliphatic synthesis lesson in which the student is to prepare a series of compounds. He may select any starting material with three carbons or less. He proceeds by specifying the appropriate reagents for each step in a reaction sequence. If the reagent he selects does not react with the starting material, he is so advised by the computer. If a reaction will occur between the reagent and the starting material, the computer responds by drawing the structure of the intermediate on the screen. This intermediate may then be used in succeeding steps in the synthetic scheme. Each problem may be approached in a number of ways, since correctness is not judged on preconceived and preprogrammed solutions.

For further information contact Professor Stanley Smith, Department of Chemistry, University of Illinois, Urbana, Illinois 61801.

DENTISTRY

Self-Evaluation of Dental Training Through CAI Simulation

The college of Dentistry, Division of Oral Pathology, in cooperation with the Ohio State Regional Medical Programs and the National Institutes of Health has developed a computer-assisted instruction tutorial-evaluation series over the past three years.

This CAI series permits the dental student to evaluate individual levels of learning about neoplasms of the oral regions. The primary strategy used is simulation of the doctor-patient relationship during history taking, physical examination, and laboratory studies. Evaluation and feedback instruction is based upon the correctness of a differential diagnosis for each clinical patient situation. The principal course at present concerns "Oral Cancer Recognition." Other courses under development are concerned with: "White Lesions of the Oral Cavity," "Radiographic Interpretation for Oral Structures," "Evaluation of Salivary Gland Lesions."

Additional CAI courses for dental hygiene instruction are nearly completed: "Chemistry Review for Physiological Chemistry," "Physics Review for Dental Radiography," "Dental Radiographic Landmarks Identification."

A multi-phasic course is in preparation dealing with "Complete Denture Prosthodontics," which utilizes clinical situations as the basis for instruction and self-evaluation.

These course materials are written in Coursewriter III language for an IBM 360 OS System and on-line 2741 teletypewriter terminals. For further information contact Dr. Gerald Gaston, Director Office of Educational Services and Research, College of Dentistry, 305 West Twelfth Avenue, The Ohio State University, Columbus, Ohio 43210.

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ECONOMICS

Simulation of a World Economy

Undergraduates in macro-economic policy courses at the University of Michigan are learning how economic policies are developed and altered by using a computer simulation of a world economy composed of ten essentially equivalent countries. In each country consumers and business firms are assumed to regulate their spending according to income, prices, interest rates, etc., while the policy maker has control of taxes, government spending, and money supply. The countries are interrelated through international trade and capital flows.

Students are divided into ten groups of three or four and each group is responsible for the policy of one country. Their goal is to achieve the best possible degree of full employment, price stability, economic growth, and balance of payments equilibrium. They are provided with a set of historical statistics for their economy over the preceding four years which they must analyze and from which they forecast the future course of their economy. On the basis of these analyses students formulate their economic policy decisions. Decisions are fed into the computer which solves for new values of all relevant variables. Policy decisions and their effects on international trade are determined and made public to the entire world economy (the class). Countries can advance at a rate of three quarters of a year per week.

Further information and data on student performance is available from Professor Robert Holbrook, Department of Economics, University of Michigan, Ann Arbor, Michigan 48104.

EDUCATION

Iowa UPSTEP: A New Program in Science Education

The Undergraduate Preservice Teacher Education Program (UPSTEP), developed by The University of Iowa and sponsored by the National Science Foundation, is an attempt to interest bright science-oriented students in a career in science teaching. Undergraduate students have little or no contact with science education faculty prior to their senior year. Many bright science-oriented undergraduates whose character and innate abilities might be well suited to the dynamic changes now evolving in science instruction are never made aware of the new prospects in education. Most preservice science teachers enter the program either because of the influence of one of their own science teachers or by default if other plans do not materialize.

In the initial stages of UPSTEP participants are expected to make no long-range commitment of any kind. Students are enrolled in a series of seminars specifically designed to develop a firm basis upon which plans related to a science teaching

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career can be made. Later in the program they are encour ged make a decision for or against a teaching career in science.

The activities of UPSTEP represent a radical departure from the trac ional separation of science teachers. From the beginning of their colleg careers, participants are in direct communication with some of the top people in the fi. of sci ce and science education. This two-way line of communication has prc ded the program with valuable feedback--information which is vital to the develo ent of a mean-ingful student program. Membership in this highly select group pr des the stu-dents with a sense of identity far stronger than is expected of mos tering dents.

For further information contact Robert E. Yager or Louis Gatte, I -UPST= Sci-ence Education Center, The University of Iowa, Iowa City, Iowa 240.

ENGINEERING

Individualized Techniques Applied to Freshman Engineering Graphics

For two years, the systems approach has been applied to the development of new instructional techniques for a University of Wisconsin-Milwaukee Engineering Graphics course, a freshman level program in the Systems-Design Department of the College of Applied Science and Engineering. The course includes basic descriptive geometry, view reading, and introduction to working drawings.

Course objectives were written and evaluated by members of the graphics staff. Inter-mediate behavioral objectives, assignment sheets, special problems and self-exams were developed. Tape-slide presentations were chosen to replace the traditional lectures. It was decided that a less formal, "classroom feel " would be maintained by using slides of blackboard presentations for visuals.

The new program was evaluated for effectiveness on the following criteria: improved student ability in problem solving and view reading; reduction of student time required for the course; improved or maintained grade distribution; reduced or maintained in-structional costs; and demonstration of acceptable drawing skills.

The results of the testing have shown greatly improved grades on unit exams and higher medians on major exams. The time required for completion of course work has been reduced for some units by as much as 35 per cent. Skill and knowledge levels are equal to or higher than those under previous procedures and the cost of course operation has been reduced by at least 18 per cent.

Special facilities are being planned to further expand the program including individual instructional laboratory carrels to allow the student to complete the course work at his own speed rather than be restricted to the rate of progress of a class group.

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Additional information and data is available from Professor E. T. Ratledge, Sy.,.. -
Design Department, University of Wisconsin–Milwaukee, Milwaukee, Wisconsin
53201.

Interdisciplinary Engineering Studies

The Schools of Engineering at Purdue University have created a new Division of
Interdisciplinary Engineering Studies, now in its second year of operation. The first
class contains approximately 120 students working on a Bachelor of Science in En-
gineering; two additional classes will enroll before the Division begins to reach a
steady size.

Over one hundred engineering professors have volunteered to counsel students and
help them construct individual and personalized curricula which satisfy their personal
educational objectives. Approval of each plan of study begins with an advisory
committee of three professors; review and final approval of each plan of study would
be carried out for the engineering faculty by an Advisory Council of each Division.

Graduation requirements include the Freshman Engineering Program (32 hours), mathe-
matics, basic sciences and engineering science (44 hours), and humanities and social
sciences (15 hours). The remaining 33 hours are taken in a major area of study which
is integrated with the engineering core requirements. A wide variety of programs
has been constructed to date. The most popular are bioengineering, environmental
engineering, systems engineering, nuclear engineering, and engineering management.
Other programs which have been constructed include applied physics, industrial de-
sign, ocean engineering, and various pre-professional programs (architecture, law
etc.).

For more information contact Professor Richard E. Grace, Division of Interdisciplinary
Engineering Studies, Purdue University, Lafayette, Indiana 47907.

Use of Tape Recorders for Grading Engineering Papers

Tape recorders now provide the means by which Engineering professors comment on
their students' papers. Rather than writing comments, they dictate them into a
tape cassette. The cassette is handed to the student with the term paper. Inexpen-
sive cassette tape recorders are available for checkout by students in the library.

This approach has a number of obvious advantages. A substantially larger amount of
information can be given to the student in a given length of time. Furthermore, the
quality of the communication is heightened. The cost of such tape recorders is on
the order of $60.00 and the individual cassettes are less than $1.00.

We have also found that the use of these recorders during the professor-student dis-
cussions of dissertations is a valuable aid for recording the nuances often missed when
the student tries to take written notes.

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Other applications invo.ve the use of tape recorders during examination of specimens under electron microsco-es which takes place in a darkened room. The student can record the details of his observations and file these together with the negatives from the photographic examination.

For additional information contact Professor R. W. Staehle, Department of Metallurgical Engineering, The Ohio State University, 116 West 19th Avenue, Columbus, Ohio 43210.

New Courses Related to Man and His Environment

The Civil Engineering Department at The University of Iowa is developing new course offerings which relate to the influence of technology on the quality of man's environment. Two new courses initiated during the past year were developed to provide a forum for non-engineering as well as engineering students to discuss contemporary problems of our society. One of the courses, "Man and His Environment," treated the application of scientific and engineering principles to the control of the air-water-land environment, including air and water resources, solid wastes management, environmental health, and legal and economic ramifications. The second course, "Technology and Society" enabled students to discuss and evaluate the technological problems facing modern man. The major objective of the course was to maximize the awareness of the relationship between technology and habitable human environment.

Approximately 25 other courses are available in pollution control and environmental engineering: "Environmental Engineering," "Microbiology," "Environmental Health," which stress health control and health standards for food and drink, air pollution, waste disposal, shelter, safety, and other aspects of the environment; "Environmental Biology," "Principles of Environmental Engineering," including the physical, chemical, and biological principles applied to water quality control, air pollution control, and solid wastes systems; and "Limnology," which considers the relationships between biota and physiochemiccl aspects of the aquatic environment.

For further information contact Rolf T. Skrinde, Chairman, Civil Engineering Department, The University of Iowa, Iowa City, Iowa 52240.

ENGLISH

Film as Lite;ature

This course seeks to integrate the teaching of film into the traditional literature curriculum as an indepenacnt art which is analogous in some ways to the drama, the novel, and the poem.

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In a series of lecture-discussion presentations, some of the unique problems of the film medium are set forth: how the two-dimensional medium attempts to mirror a three-dimensional world; the latitude of the film to reorganize space and time; the fundamentals of film editing and the effect of editing on pacing and rhythm; the psychological effect of camera angles; the relation of verbal and sound content to visual images; the uses of color; and the problems of film production.

Fifteen films are shown, usually twice, the first time without comment, the second time with the teacher making comments during the showing. The films present a range of the most significant achievement in film, including a sampling of diverse styles, periods, subject matters and schools. Films are related thematically with those that have an immediate impact coming first and those that are more complex following later.

Films are shown and then discussed; discussions range from purely formal matters to questions of ethical meaning. It is in the larger areas of interpretation that the skills of the literature teacher are most transferrable: problems of plot, characterization, mood, rhythm, structure, irony and symbolism. Film is not literature; but critical skills developed in examining literature can be applied to the film. In the middle of the course, a set piece is done on a novel turned into a film to examine the problems of novel adaptation and to observe what each medium can do with great facility and what it can do with great difficulty and much ingenuity.

For further information contact Professor John P. Frayne, University of Illinois, Urbana, Illinois 61801.

Reading Skills Laboratory for Freshman Comprehensive English Courses

Students entering Michigan State University who are deficient in reading, writing, listening, and grammar skills are required to start with the first course in the comprehensive English series, ATL 101. Until recently, the needs of ATL 101 students could be met through a multi-section conventional course using a small class discussion/lab teaching model. During the last two years, however, entering students have become far more heterogeneous and more of them lack reading and writing skills and possess non-standard language patterns.

University College has therefore established a learning resources center in which students develop reading and writing skills on a independent study basis. Funds were obtained from the MSU Educational Development Program (EDP) to develop software "packages" (multi-media instructional modules) to use in ATL 101. The major effort was devoted to production and acquisition of sets of materials to improve reading speed and comprehension, the skills most fundamental to the course objectives. Commercially available materials were evaluated by a reading specialist and several doctoral students in educational media and those that were acceptable, or modifiable, were purchased and developed into instructional modules. Each finished module consisted of 30-45 minutes of instruction and drill, presented via audio tapes, film-strips, and workbooks. Teacher's guides for ATL 101 faculty were also developed.

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Students' reading difficulties were diagnosed by an overall screening instrument. Students falling below criterion were referred to a reading specialist who performed individual diagnosis and prescribed treatments from the available modules. A total of five modules have been completed.

This project is undergoing further development. Anecdotal data from students, lab instructors, and the reading diagnostician indicate that moderate gains in reading speed and comprehension were achieved and students enjoyed not being tied to a formal class structure. The project is currently undergoing a formal evaluation using funds provided by a second EDP grant. Results of the evaluation should be available by March 1, 1971.

For further information, please contact Mrs. Jane Featherstone, 223 Bessey Hall, Michigan State University, East Lansing, Michigan 48823.

JOURNALISM

A Venture in Journalistic Simulation

Iowa's new General Journalism Program seeks to integrate theory with laboratory experience, and both with technical workshops. Designed for Sophomore and Junior year Journalism majors, the two-year undergraduate sequence stresses message preparation: writing articles and picture stories in the first year; editing and managing a newspaper in the second. A Journalism Practicum gives credit for critical review of practical media experience during summers and in the Senior year of the program.

Two groupings are provided in the 1971 program: Intermedia and Core. Intermedia is a laboratory designed to simulate a real-life journalistic community. The emphasis is on communication problem solving in a chosen medium: newspaper, magazine, or radio-television. Groups produce competitive publications for consumption within the Intermedia community and as they compete for materials and skills, they run into problems similar to those found in any publishing venture.

Core consists of five areas: discussion by professional media personnel of their own experience either in coverage and newsplay of a specific event or perhaps in establishing and staffing a broadcast station or newspaper; interdisciplinary readings in Communication literature; directed reading under faculty supervision; a Colloquium Series that brings advanced scholars in communication from various disciplines to the school; and finally, workshops and short courses that provide brief introductions to such areas of Mass Communication technology as photography, printing processes, broadcast production and computer programming.

For further information contact Malcolm S. MacLean, Jr., Director, School of Journalism, The University of Iowa, Iowa City, Iowa 52240.

LANGUAGE

A New Course in Russian Civilization

During the summer of 1970 the Department of Slavic Language and Literatures at the University of Illinois prepared a new Russian Civilization course designed to empha-size areas other than literature: the people, national and social institutions, reli-gion, the arts (architecture, sculpture, painting, music, ballet, theatre); national customs, folk crafts; East-West currents and the impact of Westernization.

The course is part of a general education sequence in the College of Liberal Arts and Sciences, required of all students majoring in the Russian Teacher Training Curriculum, and is strongly recommended as an elective for all majors of Russian Language and Literature and Russian Area Studies. It is taught in English and is open to all freshmen and sophomores.

The new civilization course is designed to complement either of two broad courses forming a survey of Russian literature, thus rounding out the student's knowledge of Russian culture and civilization. Work completed on the new course includes the following: preparation of a detailed syllabus for the course with proper aistri-bution of, and time allotment to, the material over one semester by week and class period; preparation of visual aids materials including slides, records, overhead projection materials, film strips, short films, etc.; and compilation of a detailed list of additional readings from various sources.

For additional information contact Professor Kurt Klein, Department of Slavic Lan-guages and Literatures, University of Illinois, Urbana, Illinois 61801.

MATHEMATICS

Computer Instruction in Mathematics

A new experiment in computer-assisted instruction at Purdue University is designed to isolate the problems which arise in teaching an undergraduate course in numerical methods via automated computer systems, and to evaluate the effectiveness of such systems. Students used a computer system operational on the Purdue CDC 6500 in-stead of going to class.

Each lesson is divided into three parts: a tutorial mode, a problem mode, and an in vestigation mode. The tutorial mode simulates a classroom presentation, presenting the material in a linear programmed instruction form. The student response is to a mixture of multiple choice and constructed mathematical response type items. Con-structed responses are compared with correct or anticipated expressions by an approxi-mation technique.

Each problem mode contains several standard problems which require application of a given algorithm. The student must analyze the problem and construct correct key equations and parameters. Computational results are supplied by the computer under the control of a student.

The investigation mode is structured in a similar manner but the key formulas and parameters are only syntax checked, allowing the student to apply algorithms to his own problems and to avoid conventional programming and debugging.

The system has been tested on ten undergraduates over two semesters. The students did not attend class, but took examinations with the conventional class. Conventional and experimental students with similar mathematics background (i.e. grade-point and semester hours) appeared to perform on the average equally well. The operational cost for processing time, terminal usage, and line usage was $2.63 for the average student hour.

For more information contact Dr. S. D. Conte, Department of Computer Sciences, Purdue University, Lafayette, Indiana 47907.

Individualized Instruction in Mathematics

The Mathematics Department at The Ohio State University is in the process of changing the instructional techniques used in teaching its three large-enrollment, elementary course sequences through CRIMEL, Curriculum Revision and Instruction in Mathematics at the Elementary Level. The three sequences all contain calculus with varying applications. The depth of understanding expected of the students varies with the sequence.

The program is intended to provide each student enrolling in one of the sequences the opportunity to start his training in mathematics at an appropriate level and to proceed at a pace compatible with his ability, background and interest.

At the present time, certain five-quarter, hour courses are being decomposed into mini-courses carrying one, two, and three hours of credit from which can be constructed any of the existing course sequences. During the Autumn Quarter, 1970, each of three beginning courses was decomposed into two mini-courses, one for three and the other for two hours of credit. All students (approximately 4200) enrolled in any one of the courses took the same beginning mini-course. After two weeks all students were tested and, based on the results, were advised to continue at the traditional pace, to add a three hour mini-course and accelerate their pace, or to reduce their mathematics load to the three hour course. At the same time instructional material, aids and techniques, CAI programs, testing procedures, test files and tutorial programs are being developed and tested. Video taped lessons and problem sessions for out-of-class viewing are being produced and used. Short topical films have been produced for use on the closed circuit TV system.

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The basic unit of the future system will consist of the mini-course and a collection of instructional aids (including instructors) that will enable the student to proceed through the course in his own way and at his own pace. The greatest problems will be managing such a system effectively for large number of students.

For further information contact Professor John Riner, Department of Mathematics, The Ohio State University, 231 W. 18 Avenue, Columbus, Ohio 43210.

MEDICINE

Computer-Assisted Independent Study in a Pilot Medical School

In July of 1970, a Pilot Medical School was implemented at The Ohio State University College of Medicine. Thirty-two entering medical students are now enrolled in this program, which provides for an integration of the six basic science disciplines which previously constituted the curriculum of the first two years of medical school. The program design recognizes the individual differences of students, allowing them to study and advance at individual rates of progress and to proceed through independent tracks. An adaptation of Computer-Assisted Instruction (CAI) provides the students with a method of self-evaluation which supplies tutorial feedback to each student in response to his individual performance on the self-evaluation items. Utilizing data derived from the CAI System, a series of progress and performance reports are generated for the faculty tutors to aid them in their tutorial and advisory functions. The development of the curriculum and the CAI materials for this program began in July of 1969, under a three-year research grant from the Division of Physician Manpower, National Institutes of Health.

Clinical faculty members have participated in the planning and development of the Pilot Medical School, and will provide approximately one-third of the faculty tutoring which is called for in the program. The curriculum follows a body systems approach to organization, with modules and submodules of the curriculum identified as to: (1) learning objectives, (2) multimedia learning resources appropriate to independent study, and (3) self-evaluation materials. Eleven post-tests are being developed to be administered after groupings of two, three, or four modules. The sequence of modules is prescribed in the early phases of the curriculum, but the later phases allow students to order the modules in accord with their individual preferences.

Student experiences with patients begin in their third week with implementation of courses in physical diagnosis and emergency care.

The broad objectives of this curriculum research effort are as follows: (1) to develop computer-assisted independent study curriculum and assess its operational strengths and weaknesses, (2) to determine the effectiveness of this method of learning in comparison with traditional classroom-laboratory instruction, (3) to ascertain the rates of

progress for Pilot Medical School students relative to the progress of a control group in the regular curriculum, (4) to perform a cost-benefit analysis of both the independent study curriculum and the regular curriculum, (5) to study the various learning preferences of medical students and assess their relationship to curriculum design considerations, and (6) to study the long-term effects of an independent study curriculum on those individuals who complete the program, e.g., continuing education practices.

For more detailed information, write to Dr. Lloyd R. Evans, Vice Provost for Curricula, The Ohio State University, 190 North Oval Drive, Columbus, Ohio 43210.

Intercalated Year Program in Medicine

A medical school program at the University of Michigan to encourage the growth of academic skills of underachieving, minority group undergraduates interested in a medical career will enter its third year in July, 1971. This "Intercalated Year Program" is aimed primarily at underclassmen and has four major elements: (1) core science courses taught with emphasis an relevance to a career in medicine; (2) instruction in study techniques; (3) small classes; and (4) contact with faculty and students in the Medical School. Twenty-five University of Michigan students have participated in this program and twenty more will be accepted in 1971.

Content of the program has been altered each year as a result of continuing evaluation. In 1971, the bulk of the program will be completed in one summer semester and will consist of a three-credit hour laboratory course, Introduction to Microbiology; individualized instruction in study skills; a medical seminar; instructional games involving mathematics and logic; mathematical correlations to microbiology; and a medical student "buddy system."

More complete information and data an the program are available from Dr. Andrew Zweifler, Director, Intercalated Year Program, Medical School, University of Michigan, Ann Arbor, Michigan 48104.

Self-Instruction in Pathology

In an attempt to provide the latest medical techniques and to promote learning which is more relevant to the practice of medicine, The University of Iowa's College of Medicine's Pathology Department has revised and updated most of its course objectives and methodology.

Basic information related to general techniques is presented by use of self-instructional methods. The student is provided with a set of clearly defined objectives and proceeds at his own pace. Specially designed programmed texts as well as reference and resource materials are available. Lectures are reserved for key points or for important concepts which are difficult to communicate. Clinical pathological exercises

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are also presented in the large group to illustrate the relevance of techniques and principles of medical procedures as they apply to the patient.

A major portion of the course is centered around the problem solving concept. In the laboratory the student must perform tasks related to unknown work-ups from specimens, checking patient case histories for previous illnesses or other medical disabilities or deficiencies and the analysis of other related laboratory data. Immediately prior to this laboratory experience, necessary skills of morphological analysis for problem solving exercises are taught via short programed audio tape-slide presentations. The slides consist of microscopic photographs of various specimen sections; the tapes point out areas of interest and direct attention to specific normal or abnormal areas pictured in the slides.

Following the laboratory, faculty members and students meet in small groups to discuss and analyze the implications of case history and laboratory findings.

Another important aspect of the course is related to the laboratory and its use. Students have the opportunity to visit several types of medical laboratories and to discuss in small groups such aspects of the labs as cost analysis and laboratory diagnosis afterwards.

For further information contact Dr. Thomas Kent, College of Medicine, The University of Iowa, Iowa City, Iowa 52240.

MUSIC

An Integrative Teaching Model in Music Education

Music 135 is a 3 credit hour service course on basic music concepts for elementary education majors. Traditionally taught by a conventional lecture method, the course neglected various music skills involving listening, actual performance on several instruments, and techniques for integrating music into the elementary school classroom because of its large enrollment (360 students per term). Moreover, the affective component, or "appreciation" of music and its relationship to the child and his environment, had been neglected. Consequently, a four component instructional model was developed revising both the content and methodology of the course to reflect a performance orientation.

In 1969, support was obtained from the MSU Educational Development Program (EDP), and in conjunction with the Music faculty, a performance oriented, four component instructional model was constructed. Behavioral objectives and criterion measures were developed for each component:

(1) Individual listening component: 27 self-instructional audio tapes, plus 175 page workbook/listening guide to accompany the tapes are directed

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toward skills in discriminating timbre, duration, pitch, dynamics, musical forms, and thematic elements.

(2) Skills/performance component: In laboratory sections, students are provided opportunity to produce music in a variety of media. Self-administered rating forms (cards) are used to guide students toward desired level of music performance. Final performance is evaluated by graduate teaching assistants.

(3) Cognitive component: A 470 frame programmed text on music fundamentals was developed to supplement the large group lectures and labs.

(4) Affective component: An attempt was made, primarily through lectures, to develop attitudes and appreciation for music in elementary education. Techniques for integrating contemporary music into the curriculum were presented.

Additional audio "drill" tapes will be developed, and refinements to the music fundamentals programmed text will be made. Eight 30-minute video tapes are in production showing actual music instruction and performances in elementary schools-- in order to achieve "affective" course objectives.

For further information and evaluation studies, contact Dr. Robert Sidnell, 216 Music Practice Building, Michigan State University, East Lansing, Michigan 48823.

PHILOSOPHY

Graduate Student Teaching Internship Program in Philosophy

The Department of Philosophy at Northwestern University has adopted a graduate student teaching internship program in which all graduate students in Philosophy participate. The internship is desig   to prepare students for the teaching activities which the department feels are essential to the professional commitment of the philosopher in higher education. Students participate in seminar sessions on the teaching of philosophy and teach undergraduates either within the department or in other appropriate settings such as a junior college.

Concurrently the introductory course in Philosophy has been redesigned to include two different formats: one is organized around lectures by a regular faculty member with quiz sections conducted by graduate teaching assistants; the second is built around small courses of approximately 20 students planned by a graduate teaching intern. The small sections are student-centered and represent an approach to some problem in philosophy which is usually part of the introductory effort.

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The restructured introductory course offers the interns experiences in a student-centered teaching activity as well as a more traditional faculty-centered approach. The resources of the Center for the Teaching Professions are available to the participants in this program who wish to use micro-teaching techniques to improve their performance in the classroom.

Additional information is available from the Chairman, Department of Philosophy, Northwestern University, Evanston, Illinois 60201.

PSYCHOLOGY

Cafeteria of Learning for Introductory Psychology

Various attempts in recent years have been made within the large Introductory Psychology course (2,000 students) at Purdue University to motivate and provide appropriate support for independent study. During the fall of 1970-1, as an experiment, 300 students were provided access to tutorial help any time they chose within a 22 hour-per-week schedule in lieu of conventional classroom experience. This was popularly referred to as "cafeteria of learning."

Instructional objectives were distributed every two weeks and students took multiple choice unit mastery quizzes for each set whenever they felt ready. Quizzes were scored on the spot and students tutored on items missed by trained undergraduates. Students had three opportunities to pass a quiz, two alternate multiple choice forms and an oral exam. Only passes were recorded.

A commercial student manual was used to train students to deal with all of the cognitive skills described in Bloom's taxonomy. They took a series of graded exams and were given computerized feedback sheets with scores for each cognitive skill and each content area. In addition, discussion questions were listed. Short individual conferences were held with each student to discuss the strengths and weaknesses indicated by his individualized feedback sheet.

For research purposes, students were divided into three groups: unit mastery, testing-tutorial system, and unit mastery plus testing-tutorial system. Other independent variables under study include several personality measures, and a measure of teaching style preference. Dependent measures, in addition to cognitive performance, include changes in cognitive style.

For more information contact Dr. Joseph Rubenstein, Department of Pscyhology, Purdue University, Lafayette, Indiana 47907.

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Observing Interpersonal Behavior Via Videotape Recording

Much of the research being conducted in the Center for Research in Interpersonal Behavior (CRIB) centers around the video tape recording of human interaction. Meetings between strangers are arranged and their reactions and interactions are captured by means of concealed remote television cameras. Later the persons involved can view a re-enactment of this encounter. This procedure allows for a more systematic and detailed analysis of behavior than is possible by means of direct observation.

The success of involving first-year graduates in this type of research effort has prompted the extention of this program as a continuing part of their research experience. Beginning in the 1970-71 academic semester, two additional courses were offered. They were "Small Group Analysis" and "Interaction Process." These two courses acquaint both graduate and undergraduate students with research methods directly applicable to the CRIB program--in self-disclosure, interpersonal attraction, person perception, the acquaintance process and decision making. Other studies involved negotiation between representatives of groups, attitudes and interaction and reactions to the out of the ordinary behavior.

For further information contact Carl J. Couch, Director, CRIB Program, Department of Sociology and Anthropology, 125 North Clinton, The University of Iowa, Iowa City, Iowa 52240.

Teaching Students Sensitivity to Children

Many professions require sensitivity and competence in handling the emotional needs of children. However, formal attention given this topic in professional training programs is often didactic rather than performance oriented. A strategy has been proposed in which students would view on video tape a wide range of child behaviors-- each of which would be handled "sensitively" and "insensitively" by an adult. Having viewed these examples, students apply what they have learned in dealing with live children. Segments of each student's interaction with a child are video taped and played back at discussion sessions to provide immediate feedback on sensitivity and attendant child care.

Approximately 50 one-hour video tapes were recorded to provide clear examples of how adults handle such emotional behavior as aggression, creativity, curiosity, worry, affection, fantasy, and dangerous behavior. A longitudinal technique was used, where 20 children 4-6 years old interacted individually with 20 undergraduate students for 25 sessions. Each fifth session was videotaped, and examples of appropriate handling of each type of behavior was edited into five one-hour video tapes. Each of the edited tapes was coded so any given category of behavior could be quickly located.

The five one-hour tapes are being used in an experimental course, "Sensitivity to Children." Graduate Teaching Assistants and faculty serve as discussion leaders for 5-10 undergraduate students (total enrollment is 160). Each undergraduate works with a volunteer child, interacting once a week, after seeing the tape examples. Video feedback and discussion are regularly scheduled. Informal feedback from students and faculty indicate wide acceptance of the technique and far better learning of the sensitivity skills.

For further information and evaluative data contact Dr. Gary E. Stollak, 104 Olds Hall, Michigan State University, East Lansing, Michigan 48823.

II. University-Wide Activities

ADMINISTRATION, ACADEMIC FACILITIES

Centralized Learning and Information Office

An example of innovative organizational structure at The University of Wisconsin-Green Bay is the concentration of television, media, and audiovisual services, computing and data services, University libraries, central duplicating, and the curator of art under a single administrative unit. These instructional and institutional support functions comprise the Office of Learning and Information Systems, whose respective supervisors meet frequently with the unit Executive Director to formulate long range plans and budgets in concert. Incorporation of all related services within one central office helps to assure that the various units of University life will be drawn together into an integral whole and served in the most effective manner possible.

Also recently introduced is a centrally-programmed distribution facility for audio and video course enrichment materials. Students have been trained to assume responsibility for all aspects of the system from machine operation through biweekly updating of the program roster. Recordings prepared by faculty members, such as German accent study, music criticism and audio-tutorial programs in algebra and physics, which are well suited to individualized instruction, were requested for a total of 718 transmissions during the fall semester alone. Today's experience in centralized program distribution is laying the groundwork for effective introduction of casette video when the eight-story Library/Learning Center with its 250 study carrels opens in September.

Write W. Werner Prange, Executive Director, Office of Learning Resources and Information Services, 110 South University Circle Drive, Green Bay, Wisconsin 54305 for more details.

Educational Development Fund

During the summer of 1970 the University of Minnesota Board of Regents approved "A Program for Institutional Support of Educational Development" recommended by the University Senate. The program is designed to provide a more permanent means of developing new programs and experimenting with new techniques and materials by regularly setting aside instructional funds and planning a special all-University mechanism to review proposals and determine funding. Over the next few years the fund will gradually build to a level of 3% of the University's instructional budget. The University Senate asked that a new University Committee on Educational Development be established to assume responsibility for implementing the program. A committee of seven faculty members and five students has been appointed to develop guidelines and operating procedures for the program and to act in an advisory capacity to the Vice President for Academic Administration in reviewing proposals and reports relating to educational development. The plan called for 0.5% of the instructional budget as the educational development allocation for the first year (1970-71). In

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subsequent years as the program expands to the three percent level, the plan calls for the allocation of funds in three equal shares to departments, colleges, and the University at large. Proposals are sought from the University community which introduce new and innovative methods or models of instruction and/or education inc ding advising and community-related programs.

For fur her information contact Dr. Lloyd Lofquist, Assistant Vice President for Academic Administration, 213 Morrill Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Pilot Program at The University of Michigan

Under the guidance of a standing committee and sponsored jointly by the College of Literature, Science, and the Arts and the Office of University Housing, the Pilot Program has engaged in a series of academic and residential innovations designed to foster interaction between the student's academic and residential activities. The Piolot Program believes that if a student is to be sincerely motivated in his academic work, he must see his studies as relevant to his own life beyond the classroom.

Several means have been selected thus far to foster interaction of the academic and social. Pilot Program students live in a medium-sized, co-educational residence on the main campus. Roughly seventy per cent of the students are freshmen each year, and they represent a cross section of students admitted to the College of Literature, Science, and the Arts.

Pilot students take some of their courses together. Each Pilot student elects two of his freshman courses in sections reserved only for Pilot Program. These sections differ in no way from ordinary Literature, Science, and the Arts sections except that only Pilot students register for them. As a result students know one another before entering these sections which not only promotes spontaneous discussion in class but also encourages the extension of class discussions into the students' living situation.

The principal advisers for Pilot students are residence hall staff members known as resident teaching fellows. They are graduate students selected for their interest in and concern for students and for their commitment to academic development in the residence hall. In their relationship to students they may be academic tutors, personal counselors, or simply sources of information about the academic, social, medical, or counseling services of the University.

The relationship between resident fellows and Pilot students is, furthermore, one in which intellectual adventure is expected. Sometimes new ideas are explored in an informal context--Free University courses on current topics, major speakers series, or just personal conversations. At other times a more formal setting is used, resulting in academic credit. Most of the courses developed and taught by the staff revolve around the seminar concept and are taught within the residence hall. With no more than fifteen students, each course is an interdisciplinary approach to a specific

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problem (for example, Imperialism, Alienation and Meaning, Death, Images, Science and the Modern World). These courses are approved by the College of Literature, Science, and the Arts and are taken by students as electives.

More detailed information is available from Pilot Program, The University of Michigan, 100 Observatory Street, Ann Arbor, Michigan 48104.

Undergraduate Education Curriculum Development

In December 1970, the faculty of the School of Education approved the format for a revision of present undergraduate education training programs. All entering freshman students in the School of Education will enroll in the revised Tutorial-Clinical Program. This approach, which was tested and refined over a six-year period, has developed into its present form through the cooperative efforts of students, faculty, and educational personnel in schools who assist with the clinical experience core of the program.

The curriculum revision involves the course of study in the area of professional education, approximately 20% of a student's work, and includes the following features in the professional education component: (1) sequential clinical experiences spread through the student's undergraduate years; (2) tutorials to provide individual assistance to students; (3) small-group, vari-durational seminars and workshops designed to foster insights into and understandings of the nature, issues, and developments of education in elementary and secondary schools; (4) opportunities for individualized planning; and (5) opportunities for advanced prospective teachers, during the last stage of the program, to serve as educational associates and counselors in the earlier phases of the program itself and to undertake research and other projects to improve their professional competence.

In this program students will advance their professional development through two basic kinds of activities: (1) the study of curricula and the practice of teaching at successive levels of professional sophistication; and (2) the study of educational theory, knowledge, and practice, and the analysis of critical issues in the foundation fields of education. These latter studies will be scheduled at times in the student's program when subject matter will have maximum relevance to clinical experiences.

Each student in the School of Education will take approximately 80 percent of the Bachelor's degree program in general education and teaching fields. Those preparing to teach in high school will develop a major in an academic area. Elementary teachers will concentrate on two or three academic areas commonly taught in elementary schools.

For further information contact B. J. Chandler, Dean, School of Education, Northwestern University, Evanston, Illinois 60201.

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University of Illinois' Commission for the Reform of Undergraduate Education and Living

On October 12, 1970, Chancellor J. W. Peltason of the Urbana-Champaign campus of the University of Illinois appointed a Commission for the Reform of Undergraduate Education and Living (CRUEL). The Commission consists of sixty-one members drawn from the ranks of the administration, faculty, and student body.

Before the creation of the full Commission, a CRUEL staff assistant was assigned a two-fold research task: to provide the Commission with sufficient data to assess the current status of innovative programs at other colleges and universities in the United States; and to investigate the current efforts of the Urbana-Champaign campus in the area of educational innovation. Two reports resulted: the first described twenty-seven major innovative programs which had been implemented at one or more of ninety-three colleges or universities across the country; the second listed briefly sixty-seven innovative projects on the Urbana-Champaign campus.

Among the programs described in the latter report were the Alternate Teacher Education Program in Education; Liberal Arts and Science's community development laboratory; the College of Environmental Design; academic curriculum revisions; the wide use of some variety of field work in various schools; the Illini Symposia for Women sponsored by Student Services; and the Law College's Program in Environmental Research.

The initial weekend conference was held in late October. Work-study groups were formed to discuss four major areas: Curriculum, Academic Advising and Counseling, Instruction, and Living-Learning Environments. The discussion in these groups resulted in the identification of areas in which educational innovations should be considered.

Since the opening conference, members of the Commission have formed small task forces to produce information or proposals for innovative projects in the areas identified at the conference.

For further information contact Vice Chancellor George Crampton, University of Illinois, Urbana, Illinois 61801.

INTERDISCIPLINARY PROGRAMS

Rural Adult Education Program

University of Wisconsin's Extension has unveiled a three-year project funded by the U.S. Office of Education and designed to serve adults in four Wisconsin counties

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through televised programs. Called Rural Family Development (RFD), it seeks to motivate the viewer to participate in the home-study programs accompanying the television programs and in other educational activities.

Each RFD show (twenty 30-minute shows are currently broadcast four times weekly) is made up of several short features--about producing better hogs, cooking inexpensive meals, or money-saving shortcuts. Questions, comments or complaints can be sent to the RFD office in Madison to be answered on television or in the monthly publication "Almanac" sent to participating adults.

Home study materials aimed at the adult with less than a high school education have been written to treat televised topics in greater detail. The idea is to get away from the textbook approach to learning. "Adults don't have to learn everything-- just those things they need to learn or are interested in."

The third part of RFD is the home visit. Each week an RFD teacher will visit RFD members, assisting them in selecting and using their content units.

More information is available from Mr. Boris Frank, Project Director, Rural Family Development, University Extension, P.O. Box 5421, Madison, Wisconsin 53705.

The Project Community

The Project Community enlists the the help of 400 University of Michigan students in providing individual tutorial attention to children and adults of various ages and in diverse institutions in the Ann Arbor area. At the same time, it serves as a vehicle for educational innovation in the community.

The project incorporates fourteen efforts which not only provide community service but also contribute to the learning experience of university students and provide them with constructive ways to express their social concern. Among the projects in operation are the following: tutoring public school children in a variety of subjects either individually or in small groups; working with small groups of children between 6 and 12 in the Black Liberation School to provide them with academic and social skills necessary to function outside their immediate communities; tutoring delinquent girls and boys in several training schools and half-way houses; helping to initiate a child care center for pregnant high school women in a nearby community; working in several preschool day care centers; providing college and vocational counseling and establishing a cultural, educational and recreational program for Black students in an area high school; tutoring community college students; supporting an Ann Arbor "free school" for junior and senior high school students.

Project Community receives limited support from the University and relies on contributions and fund raising efforts for the remainder of its operating budget. The project also includes a tutorial course in which students meet in small groups to explore the role of schools in society, the school as a system itself, and the impact of innovative techniques and structures on the schools.

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For further information contact The Project Community, 2547 Student Activities Building, University of Michigan, Ann Arbor, Michigan 48104.

MEASUREMENT AND EVALUATION

Course and Instructor Evaluation

For over two decades Purdue University's Measurement and Research Center has experimented with and developed various methods of student evaluation of instructors. The longest and perhaps most widely researched is the Purdue Rating Scale for Instruction which was developed by Dr. Herman H. Remmers and his students. Computerized output provides instructors, departments, and colleges with profiles of their instructional effectiveness. A number of supplementary evaluation instruments and techniques has also been developed by MRC. Students became interested, and for the past three years have developed their own course and instructor evaluation program.

Over eight hundred and fifty courses are examined in the publication of the 1970 Course and Evaluation Program at the university. The entire program is student controlled and operated. University influence is only used in the area of financial guidance.

Early in the fall the students responsible for the project decide upon what course areas emphasis will be placed. As Purdue has instructor selection for multi-divisional courses beyond the three hundred level, each instructor in this category is contacted. Below the three hundred level the emphasis is on sampling each course rather than each professor.

Evaluation consists in classroom response to questionnaires using mark sense cards. Over 30,000 response cards were processed this fall. After analysis all data regarding each instructor is made available to him prior to the publication of the report.

Technical information is available from Dr. Charles Van Horn, Measurement and Research Center, Agricultural Annex I, Purdue University, Lafayette, Indiana 47907. For student information contact Mr. Thomas R. Bruce, Editor, Course and Instructor Evaluation, Box 658, Purdue Memorial Center, Purdue University, Lafayette, Indiana 47907.

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TEACHING ASSISTANTS

Seminar on College Teaching

During February, 1970, the Center for the Teaching Professions at Northwestern
University proposed to the Dean of the Graduate School that a graduate level semi-
nar experience be established which would allow departments within the University
to provide some type of training activity for those graduate students who wished to
prepare for careers in teaching. As a result, a seminar was established within the
Graduate School which could be offered by any department as a way of giving the
graduate student an opportunity to prepare for his instructional commitments.

The seminar was first used during the summer of 1970 in an experiment organized by
the Center for the Teaching Professions for students in Sociology, Political Science,
Philosophy, and History. It was designed to give them an opportunity to become
better acquainted with some of the central issues in college teaching as well as to
provide opportunities for self-assessment of teaching skills through the use of micro-
teaching techniques. The increasing use of this vehicle by other departments both
as training mechanism and as a way of improving undergraduate teaching, suggests
that the seminar will become an accepted part of the reward structure associated with
the improvement of instruction at Northwestern. To be able to prepare for college
teaching in something less than the traditional haphazard fashion and at the same
time accrue course credit toward a graduate degree represents one approach to in-
structional innovation which is attractive both to students and to faculty.

For further information contact Dr. B. Claude Mathis, Director, Center for the Teach-
ing Professions, Northwestern University, 2000 Sheridan Road, Evanston, Illinois
60201.

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