A STUDY OF THE USE OF MULTI-MEDIA INSTRUCTIONAL MATERIALS
IN A LOWER DIVISION ARCHAEOLOGY COURSE
AT SANTA BARBARA CITY COLLEGE

Santa Barbara City College

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INTRODUCTION

In an era when funding regulations are more stringent and the demand for access to higher education most pressing, educational institutions are called upon to operate at optimum efficiency. This means that the "equipment," i.e., classrooms, libraries, laboratories and the man-hours of staff must be utilized in such a fashion as to maximize effective learning.

Within the past five years, much has been contributed by the behavioral sciences to the theory of learning, and to the development of learning strategies that may have a positive effect on student mastery of cognitive material. Schalock has outlined four aspects of learning:

A) **Learner outcomes:** e.g., concepts, principles, skills, personality characteristics.

B) **Learning processes:** e.g., information selection, transmission, storage and retrieval.

C) **Learner characteristics:** e.g., stage of intellectual development, experimental background and cognitive style.

D) **Setting characteristics:** e.g., teacher characteristics, physical characteristics of the classroom and building or district policies regarding educational objectives or classroom management.

A schematic representation of these variables is given below as an illustration of interactions among the various elements.
If we assume that there are systematic relationships between classes of instructional operations and learner outcomes, given a constant instructional content, then it is possible to develop an instructional operations design which may be experimentally manipulated in order to achieve maximization of mastery while at the same time giving consideration to those elements in the design which may pose internal threats to the validity of the study. In the present experiment a comparison was made of the "traditional" method of instruction (TMS) presently in use at Santa Barbara City College, and the Audio-Tutorial Systems (ATS) also presently in use at SBCC. The target course was Introduction to Field Archaeology.

The design plan is represented in Figure II below. This design plan is a two group experimental and control used because of its ability to meet all of the practical threats to internal and external validity. In the figure, "R" means random assignment, "O" means observation, and "X" means treatment or exposure.

Figure II - Experimental Design Paradigm

\[ O_1 \ X \ O_2 \quad \text{Experimental (ATS)} \]

\[ R \ X \]

\[ O_1 \ X \ O_2 \quad \text{Control (TMS)} \]
In this study, the students could not be randomly assigned to the class, but the decision of which class would be experimentally treated was made randomly. In addition, pre-test data was obtained for the two groups of students to ascertain whether they were comparable. Measures of central tendency and dispersion were used as the basis for measuring comparability of the groups. "t" tests and "F" tests were used for this purpose.

The "traditional methods system (TMS)" includes a lecture series, meeting three hours weekly with the entirety of the class meeting at a given scheduled time in a static place. The factual material is presented in the lecture supplements, or is supplemented by readings in a textbook. In addition, films and slides, as well as various other audio visual devices are employed where appropriate to illustrate the points presented in the lecture.

Out of a fifty-five minute classroom period, an analysis of activity yields approximately 10% of the lecture period consumed by classroom mechanics of roll call, accounting and updating assignments or amending the class schedule, the remainder of the period spent with students taking notes, listening to the lecture and observing occasional media supplements.

The format for the audiotutorial systems of instruction (ATS) in use at SBCC is basically based on the Purdue-Postewhale system, but with some variations. The SBCC system entails use of a SAS for one hour weekly with instructor. The remainder of the student's time is spent in ISS learning at his own speed in one of the study carrels, each of which is equipped with a tape deck, slide projector and earphones.

The course content is broken up into weekly assignments, presented by means of audio tape, a set of slides, a study guide and assigned reading. The assignment begins with the tape and is followed by informal tutoring. This approach allows keyed-in reading assignments at the precise moment in the learning process where they
will be most effective. By and large, the combination of photographs, slides and diagrams are sufficient to carry the factual and visual material with an occasional single film strip concept being used.

The Study Guide for this experimental group was tailor-made and produced locally to be sold to the student at cost. More than a syllabus or set of notes, the study guide is a workbook with original readings and problems to be solved by the student in the course of completion. With its many tables and illustrations, the loose leaf nature of the study guide allows for quarterly revision with ease. This guide, and all visual and audio materials for the course, were prepared by Dr. Brian Fagan of the University of California, Santa Barbara. It is through his courtesy that the experiment was made possible.

EVALUATION PROCEDURES

Under the TMS the students were graded on a competitive curve with approximately 50% A's and B's. The material being graded was a teacher-made midterm and final (combination objective and essay) examination. The combination of a set pace, grading curves and fixed exam schedule makes no allowance for the individual learning speeds or for the fact that some individuals learn more efficiently with various media, i.e., listening, visual or reading, and failing to make allowances for the preceding, the TMS places an often extreme amount of unnecessary pressure on the student while the prime objective of the course (mastery of the material) is lost in the shuffle.

The design for evaluating the student in the ATS system was based on some essential considerations.

1) That the subject matter could be broken into two major types, factual and theoretical. Accordingly, the term "mastery" was divided into two categories; absolute mastery of factual and

\(^{1}\) Fagan, Brian. *The Use of Multimedia in a Lower Division Course.*
relative mastery of theoretical, at the same time, recognizing that any exam with large numbers of students was bound to be predominately factual.

2) That students could be graded on the basis of their mastery of the subject without reference to one another, thus eliminating the grading "curve."

3) A flexible exam schedule was considered necessary.

4) A means of indicating which students were failing or falling behind was essential.

The test instrument devised was based on twenty essay and problem questions, rather than multiple choice type. These questions cover the full range of course content, and are given to the students at the beginning of the course.

The grade basis for mastery was as follows on all tests:

A  90%
B  83%
C  75%
FAIL 65%

Two alternate test dates were offered with the opportunity to take the test offered twice, thus allowing the student to improve his mastery level if he so desired.

A review of the LRC record cards was found sufficient to indicate those students who were falling behind either through procrastination or academic reasons and upon discerning the situation, an attempt was made to get in touch with the individual for remedial assistance.

The anticipated result of the ATS approach is: (1) specific education objectives are laid out for the student, thus cutting the ever potential excess of irrelevant
work which may, in addition to being extremely frustrating to the student, exercise an inhibitory effect with respect to the desirable learning and (2) the student is free to learn at his own speed, not the instructors, and (3) that most of the learning takes place in small groups or individually with a greater amount of vis a vis communication between instructor and student thus allowing for more efficient type of student learning time.

Most essential to the A-T system approach is the definition of the objectives for student achievement and instructor identification of the most appropriate means of meeting these objectives.

POPULATION

Subjects for this study were drawn from classes enrolled in Introduction to Archaeology III at Santa Barbara City College in the fall semester of 1971. The subjects were matched for academic aptitude and the experimental treatment was randomly assigned to one half, herein referred to as the ATS group.

The matching of the subjects was accomplished by a comparison of SCAT-V scores. As shown in Table I, there was no statistically significant difference between the two groups.

<table>
<thead>
<tr>
<th>Table I</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comparison of SCAT-V Scores</strong></td>
</tr>
<tr>
<td><strong>Experimental Vs Non-Experimental Groups</strong></td>
</tr>
<tr>
<td>Exp (ATS)</td>
</tr>
<tr>
<td>Non-Exp (TMS)</td>
</tr>
</tbody>
</table>

Two criterion variables were established for a comparison of the TMS and the ATS groups. These were:

A) Performance (raw scores) on the first teacher made midterm test which was administered in identical form to both groups.

B) Achievement and persistence data on the groups, taken at the conclusion of the semester.
RESULTS

A null hypothesis was formulated as follows for criterion A:

1) There were no significant ($p < 0.05$) difference in the mastery
of the substantive dimension according to the teacher made mastery
test.

| TABLE II |
| Raw Scores on Mastery Exam |
|---------|--------|--------|
| ATS     | N=13   | 58.846 | 19.01  |
| TMS     | N=14   | 62.143 | 26.76  |

Difference $= 3.297$, "Z" score $= 0.374$ Not statistically
significant ($p < 0.05$). Decision was to accept the null
hypothesis.

A second null hypothesis was formulated for criterion B:

There is no statistically significant ($p < 0.05$) difference in
the achievement and persistence of the ATS vs. TMS groups reflected
in the proportions of students grades received (AB or C vs. all other
grades).

<p>| TABLE III |
| Comparison of proportions of |
| AB or C grades vs all other grades |
| Experimental vs non-experimental groups |
| # AB or C Received |</p>
<table>
<thead>
<tr>
<th>N</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS</td>
<td>N=15</td>
</tr>
<tr>
<td>TMS</td>
<td>N=15</td>
</tr>
</tbody>
</table>

Difference for $= .133$  $z = .729$

"Z" score not statistically significant ($p = 0.05$)

The decision was to accept the null hypothesis.
Although not a part of the original design of this experimental problem, the results were compared between the ATS group and a group of lower division students at the University of California, Santa Barbara, who were enrolled in an Introduction to Archaeology class using identical experimental materials and methods.

For the purpose of comparison, a group UC-ATS N=31 was randomly drawn from class roster of Dr. Brian Fagan, using a table of random numbers. The comparison was made on the basis of criterion B, experimental hypothesis #2.

Results of this comparison were as follows:

Table IV

<table>
<thead>
<tr>
<th></th>
<th># AB or C Received</th>
<th>( Z = 2.301 ) (( p &lt; .05 )) results were statistically significant.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS - SBCC N=15</td>
<td>7 = .467</td>
<td></td>
</tr>
<tr>
<td>ATS - UCSB N=31</td>
<td>25 = .806</td>
<td></td>
</tr>
</tbody>
</table>

In light of the results of this comparison a further comparison was made of SBCC-ATS and UCSB-ATS groups for measured academic aptitude. For illustrative purposes, it was necessary to transform the SCAT scores of the SBCC-ATS group to the SAT standard mean of 500, and sigma of 100.

Table V

<table>
<thead>
<tr>
<th>Academic Aptitude Scores</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SBCC Experimental Vs. UCSB ATS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transformed ( \bar{X} )</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>ATS-SBCC N=16</td>
<td>477.63</td>
</tr>
<tr>
<td></td>
<td>81.90</td>
</tr>
<tr>
<td>ATS-UCSB N=26</td>
<td>568.73</td>
</tr>
<tr>
<td></td>
<td>64.04</td>
</tr>
</tbody>
</table>

The "Z" scores for UCSB vs. SBCC (ATS) were \( Z = 3.792 \) and is statistically significant (\( p < .05 \))
One possible interpretation of the results of the SBCC - UCSB comparison is that the ATS system is more effective for the more academically talented. A contaminating variable in this case was that the UCSB course was being conducted by the man who developed the media materials used in both settings. The differences in performance between the two groups at the two campuses may be attributed partly to the lack of familiarity with the learning materials at SBCC, so that the instructor in the SBCC experiment was less able to direct his students to critical materials in the media presentation.

**DISCUSSION**

It is clear from the descriptions of the differences in the two systems of instruction that the ATS places a greater degree of emphasis on the individual student being able to coordinate his study needs and practices somewhat autonomously.

A traditional classroom situation demands certain rules and regulations of behaviors. One among these is that when the instructor speaks, the students sit and listen. He undergoes a certain peer group pressure to abide by these rules and regulatory expectations, and this serves to reinforce the social ritual of the traditional learning experience.

Konrad Lorenz's work "On Aggression" demonstrates the confusion and concomitant anxiety that lower order organisms undergo during deviations from normally accustomed ritualistic behavior patterns. A certain amount of anxiety is occasioned by any learning experience. However, it could be argued effectively that an excess of anxiety (from whatever source) produces elements of destructive interference in learning.

Studies by Dale Tillery in examining differences in social maturity levels between comparable groups of students attending a university vs. those attending junior colleges reported relevant findings to this experiment. Using the Omnibus
Personality Inventory to differentiate between the type of student who, according to Webster "was personally free, without requiring rules and rituals for managing social relationships" and students with the opposite characteristic, Tillery arrived at the following results: Of the sample studied, the sample from the junior college had only half the percentage of high social maturity scores that the university group had (20% vs. 40%) and three times the percentage of low scores (21% vs. 7%).

From this and the results of the comparison of the ability of the ATS system being employed at the University of California, Santa Barbara vs. Santa Barbara City College, it would be possible to conclude that the ATS system favors the student of higher academic aptitude level and the student who has a greater degree of social maturity.

If we are to maintain the integrity of the junior college as an equitable source of education for both high achieving and other students, then we must continue to investigate ways to improve our ability to reach all segments of actual and potential college populations. This experiment raises certain questions concerning the efficacy of ATS to improve learning for the community college setting, which is characterized by measurably lower academic aptitude and "social maturity" than other segments of higher education.
Project Background and Importance:

On 8 November 1895, Wilhelm Conrad Roentgen discovered x-rays.

"... at a meeting in Roentgen's native town in 1957, Roentgen plaque bearer Dr. A.H. Compton made this noble statement:

"We can show that the number of lives that have been saved by x-rays since their discovery by Roentgen is as great as the number of lives that have been taken in all of the wars that have been fought since that time." (From the Epilogue, page 2059, Vol. II, CLASSIC DESCRIPTIONS IN DIAGNOSTIC ROENTGENOLOGY, Andre J. Brower, M.D.).

"... In 1969, the Commission on Instructional Technology made a study to determine the effect technology is having on American education--these findings are relevant:

Learning is impeded by such troubles as the increasing gap between education's income and the shortage of good teachers in the right places.

Present school organization takes little account of even what is now known about the process of human learning, including the range of individual differences among learners and styles of learning. This condition makes schools particularly unresponsive to the needs of disadvantaged and minority group students.

The ways that students learn outside school differ radically from the ways they learn inside school. Formal education makes only limited use of the many means of communication which society at large finds indispensable.

The Commission concluded that 'the nation should increase its investment in instructional technology, thereby upgrading the quality of education, and ultimately, the quality of individuals' lives and of society in general.' (Source: THE IDEA REPORTER, Spring, 1970.)" (From the Education section of RADIOLOGIC TECHNOLOGY, January 1971, by Robert L. Coyle, B.S., R.T. (ARRT), Education Director of the American Society of Radiologic Technologists.)
Project Field:

Radiologic technology is a combination of concepts, manipulative skills and interpersonal relationships—it is a science and an art.

Project Goals:

1. To provide for the range of individual differences among students.

2. To reduce the amount of time required for both fast and slow learners to bring both concepts and manipulative skills into productive focus for the benefit of the most important person involved—the patient.

Some students can grasp the basic information and concepts during one exposure or involvement in the classroom—and the slower learners can review the audio-visual aids as many times as necessary on an individual basis in the Learning Resources Center or by appointment or office visit with the teacher.

This will fit in with the educational pattern that will individualize instruction more to allow each student to proceed, within limits, at his own pace. This is especially important in radiologic technology: the fast learner may need as much extra practice with the x-ray equipment to develop his manipulative skills as the slow learner needs to spend reviewing the audio-visual aids to grasp the concepts.

Audio-visual aids will help both learn concepts and skills and interpersonal relationships faster—audio-visual aids shorten training time in each of the six courses in our two-year radiologic technology program.

Many years ago the Chinese said that one picture was worth ten thousand words. Our technology now allows us to take that picture instantly, project it on a screen, that an electric motor rolls down from the ceiling for us, for the entire class to view together—and we can even add motion and sound to increase the "wordage value" of our training film—and then we can take a section of it to make a film loop that the slow learner can view over and over and over, until the concept becomes a part of him.

Project Life:

The project results will be valuable for many years—while the application of basic concepts is continually and rapidly changing with the ever increasing flood of improvements in x-ray equipment, the basic concepts remain the same.

My job is to give the students a clear understanding of these basic concepts—maximum use of audio-visual aids will speed up the learning process, which, in turn, will give each SECC student more time to understand the WHY of each step in addition to the What/Who/When/Where and How.

With a good two-year foundation at SECC, each student can progress through his following intern (full-time clinical experience) year in a local hospital, pass his nation-registry examination (American Registry of Radiologic Technologists--ARRT) and become a part of the working force as a qualified beginning staff technologist. Or
he can continue his education in a four-year college or university.

At a state convention of radiologic technologists in Arizona, Herbert Welsh, M.D., well-known Tucson radiologist said, "Give me an R.T. who is a good staff technologist (knows the basic concepts well and can produce good films consistently and rapidly on all basic examinations) and I can help him become a qualified special procedures technologist in a short period of training."

At the radiologic technology teachers' conference at UCLA, 18 November 1972, there was a loud complaint about technologists who do not have good basic concepts understanding: with such knowledge, technologists can soon learn to operate the most sophisticated equipment--but without it, even the most sophisticated equipment will still turn out films that reflect the level of knowledge and skill of the technologist, as films from one large California institution revealed.

Project Economy:

The project is cutting costs wherever possible without sacrificing quality: two sheets of plate glass are being used for duplicating x-rays--the commercial photographic 14 x 17 printer is about $15 and the glass-front cassette is more: cost of the plate glass is $7, a second-hand camera for student involvement, $27.50, and for additional student involvement and a lesson in economy, material for us to build our own filing cabinet at about one-fourth the cost of a commercial x-ray film storage cabinet (for our duplicated films.)

Audio-Visual Aids:

1. Duplicating film
   Each school of radiologic technology needs a complete file of normal radiographs of all routine examinations.

   When I wrote Eastman Kodak to ask their price for such a set, I was amazed to find that such a set was not available. But we can build our own set--more about this and the student and community involvement in the attachment on duplicating film.

2. Slides--color and black and white--and color prints
   For projection, individual study and projects and bulletin board displays at appropriate times.

3. Cassette tapes
   For individual review or missed lectures.

4. Super Eight training films
   For classroom--and for film loops, also for LRC.

5. Overhead transparencies, with overlays--classroom.

6. Duplicating--individual sheets for notebooks.
7. Storage cabinet materials--"spare time" building by students and teacher.

8. Voice writer - portable recorder--to let the students hear themselves talking to patients in the clinical areas; and for on-the-spot clinical notes for continual improvement of instruction.

9. 16 mm film rental - to get a look at films beyond the normal school budget.

Project Progress:

Duplicated film, with the originals for comparison, slides (both locally produced and commercially obtained), equipment, etc., will be presented as time permits--or at a later date for an individual presentation to the Board of Trustees.
A NEW HORIZON IN DIAGNOSTIC
RADIOLOGIC TECHNOLOGY EDUCATION

An idea that may help eventually by:

+ REDUCING RADIATION TO THE PATIENT
+ INCREASING DEPARTMENTAL PATIENT FLOW
+ IMPROVING TOTAL ECONOMY
+ PROVIDING MORE LEGAL PROTECTION
+ IMPROVING DOCTOR-PATIENT-HOSPITAL RELATIONSHIPS
+ UPGRADING THE QUALITY OF RADIOGRAPHS

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and

Education Coordinator
California Society of Radiologic Technologists

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When something seems too good to be true, it usually is... You, therefore, are invited to study this simple idea with an eagle eye, a very sharp pencil and a healthy "YOU GOTTA SHOW ME" attitude.

A New Use for X-Ray Duplicating Film

When a radiograph is incorrectly exposed, the patient has to be called back for a repeat — back from the waiting room, or his room in the hospital or, sometimes, even back from his home.

This means that he must be re-exposed to radiation for the repeat film, which, in turn, slows down departmental patient flow by tying up the necessary personnel, hallway use and exposure room and x-ray machine. The extra exposure shortens the life of the x-ray tube and the other equipment involved — consequently the cost of hospitalization goes up another tiny notch. Waste, in the long run, helps no one; and it is eventually the patient and or the taxpayer who pays the bills. It affects us all ("Ask not for whom the bell tolls...")

Breaking the Repeat Cycle

What if we could take the incorrectly exposed film to a duplicating film technologist (instead of taking the patient back to the x-ray room,) for duplicating at a lighter or slightly darker density?

This would reduce radiation to the patient, increase departmental patient flow and help reduce the total cost of hospitalization — each large department now comes fully equipped with efficient darkroom technologists: this is economically sound. Their pay is less because their training requires less time — in two weeks a very intelligent blind man was trained to operate the darkroom by my wife, who is also an R.T. And this was in 1955, with hand developing instead of our present automatic processing. It is our hope that more and more departments will employ blind persons as darkroom technologists.

The darkroom technologists could be advanced to the new job description level of Duplicating Technologists — a little more training, more skill and some more educational background.

Is This Practical?

The two large film companies' Santa Barbara representatives gave me sample boxes of their duplicating film for beginning copying of local radiographs for a teaching file. And now I am working on an innovative project, THE MAXIMUM USE OF AUDIO-VISUAL AIDS FOR RADIOLOGIC TECHNOLOGY EDUCATION, funded by Santa Barbara City College; and some of my students are working with me on duplicating film studies using film provided by my project funds. The results of initial tests are exciting.

Not only can overall density be reduced, or slightly increased; but spot work can be done: in 1937, while still in high school, I worked many nights in a friend's attic darkroom enlarging photographs. There I learned the art of "dodging." (Holding back the light through less dense areas of the negative.) Using this technique, in reverse, the duplicating film technologist could improve on the quality of even some...
"correctly exposed" radiographs...and become "light artists."

The possibilities are not endless, but definitely many: for the increased legal protection for departments, it may be that soon no film will ever leave the hospital -- only duplicates. This would eliminate the problem of lost, strayed or otherwise missing films. This can become a major problem in case of legal action against the hospital.

With duplicating machines, for direct copies, already on the market, patients may soon be able to obtain duplicates of one or more of their radiographs for an additional fee. This, while advisable in only a limited number of cases, would give more work to our duplicating techs, and it would definitely eliminate the ill-will generated by the patient who is ignorant of the ownership of the original radiograph and who gets all "riled up" because he can't have the films he has "paid for."

With increased demand for direct duplicates and "improved" duplicates, the marvelous advances in electronics could give us new inventions for benefitting the patient and reducing waste by building on the simple idea of a new use for duplicating film.

And the increased demand could lead the x-ray film companies to develop more sophisticated duplicating films with varying characteristic curves for different applications.

A Good Idea

It has been said that "good" is that which helps everyone and harms no one. The only drawback I have been able to think of is the very limited increase in the use of silver from the world's dwindling supply; and even this might help by adding more encouragement to those who are working hard to develop an equal or better substitute for the use of silver bromide films.

You can help by testing this idea in your own department and by studying your own results for either drawbacks or additional advantages.

Note: Many blind persons might take much longer than two weeks for training; but once they are trained, they can do excellent work in the darkroom.

Ed E Fleming
30 Nov. 72
"LEARNING PACKETS" FOR CLASS AND SELF INSTRUCTION (CONVERSATION)

To teach a successful conversation class, the instructor must motivate the acquisition of useful vocabulary in a functional and cohesive manner. The vocabulary must be sufficiently general to warrant the students' investment of energy and should be chosen to facilitate a free exchange of ideas on a given topic.

Since quick access to stored vocabulary is necessary in conversation, it seems better if the association of the new words is made directly with an object or event, rather than the English equivalent. It also appears to me that the conversation should be guided to themes which the student might discuss in his own language: Personal feelings and opinions, events experienced or anticipated, newly acquired information, or observations about his environment.

I have attempted to incorporate these elements into the design of my "Conversation Learning Packets." Each packet consists of three parts:

1. A collage on a general theme: the home, food, sports, nature, Peanuts cartoons, and one on computer dating (based on a questionnaire found in a German magazine), etc.

2. Pairs of slides consisting of a picture taken from the collage: The first slide contains a set of vocabulary words (in German only) which are based on elements of the picture. The second slide contains a method for testing the learning of the vocabulary on the first slide (the student may alternate between these two until he feels secure with the new words.)
TO THE STUDENT:

These slides are designed to help you focus on a group of vocabulary words which will be useful in discussing our Topic of the Week: "WHO NEEDS A PROFESSION?"

The slides are arranged in pairs. The first slide is in German only. Attempt to guess the meaning of the words before checking the English definitions on the second slide of the pair. Use the second slide to test your learning of the vocabulary words; and feel quite free to look back if you cannot recall the German.

When you have become familiar with the words, please turn on the coordinated tape. Each vocabulary word is pronounced on the tape with plenty of time for student repetition. The questions posed on the tape will constitute the basis for our class discussion. Please answer them with care!

Before coming to class, please fill out the enclosed

BELOHMUT QUESTICNAIRE

AUF DEUTSCH

See you in class
SLIDE 1:
1. What is the boy looking at?
2. Who wrote the formulas on the blackboard?
3. What is the boy thinking?

SLIDE 2:
1. Is driving a dangerous sport in Germany?
2. Do you believe in insurance?
3. Have you ever had an automobile accident? What happened?

SLIDE 3:
1. What is happening in the picture? Why?
2. What parts of the body become visible through X-ray?
3. Are you interested in a profession connected with medicine?

SLIDE 4:
1. Have you served in the military?
2. What do you think about "allgemeine Wehrpflicht"?
3. Does every country need an army?

SLIDE 5:
1. What occupation requires the tools in the picture?
2. Do you like to make things?
3. What was your most satisfying creation—wood, cloth etc.?

SLIDE 6:
1. How can an architect make use of the computer?
2. What elements must your dreamhouse contain?

SLIDE 7:
1. From the point of view of income, is a University education worthwhile for a German Engineer?
2. The present exchange rate is 3DM=$1.00. How does the average salary for a German Engineer compare with the salary of an American Engineer?
SLIDE 8:
1. Where is the girl?
2. Who wants to transform man's biological being?
3. What kinds of biological changes would you consider desirable for man?

SLIDE 9:
1. What are the men in the picture doing?
2. How would you describe the men?
3. Can you explain a chemical or physical phenomenon in German?
3. A tape which is coordinated with the pairs of slides: This tape is designed to be used after the vocabulary has been learned. It pronounces the appropriate vocabulary words as the picture is shown and poses general questions (in German) which relate the slide to a broader topic appropriate for conversation at the desired level. The student uses these general questions as dictation and later prepares answers which will provide the basis for conversation in the classroom. A small self-testing section may also be included.

The intention of the packets is to provide structure to the conversation without limiting its scope. The advantage of the approach lies in its flexibility. Since it is possible to create these learning packets on any topic, the teacher can accommodate the interests of the class by varying the topics according to expressed desire. The students themselves can contribute to the creation of the packets by bringing pictures or objects they would like to talk about.

Suzanne K. Culler
Asst. Professor, Foreign Language

11-27-72
Graphic Production Proficiency Program

This program is viewed as a practical training project at Santa Barbara City College with the cooperation of the Graphic Arts Association of the Tri-Counties.

It is specifically designed to provide students who have demonstrated aptitude and interest in graphic arts with an intensive program involving study, experimentation, and application of graphic production techniques. Various specific skills not found entirely in any one of the regular graphic communications subjects will be developed. The students will employ practical experience in planning, typography and design, typographical composition and layout, photography, platemaking, offset lithography, binding techniques, and other graphic production methods where applicable. Modern methods and equipment should be utilized in the laboratories at Santa Barbara City College and at the various graphic arts industries in the tri-counties area. Creative thinking and planning in design should be encouraged. The students should accept the responsibilities of individual and group projects.

The instructional program is made up of a series of lessons. Each lesson includes the teaching of skills, knowledges, and appreciations in varying amounts necessary to help the student become proficient in his area. In this course of instruction, each instructional package will be in a teaching sequence and listed under the major unit of the instructional program. Each unit will contain a lesson analysis sheet and the necessary supplemental sheets needed for instruction. Persons being trained in the graphic arts industry will have the opportunity to review
their subject areas through the use of instructional written materials (including programmed units), taped presentations, slides and films.

The area of instruction is seen as vocational in nature, falling into the area of industrial education; but it may also be utilized as a significant part of any printing apprenticeship. At the end of each segment of instruction at Santa Barbara City College, or in the graphic arts industry in the tri-counties area, the students will be evaluated for certificates of proficiency by written and practical examinations. This will be achieved with the cooperation of the Graphic Arts Association of the Tri-Counties. The persons working in industry, upon satisfactorily completing the proficiency exams, are entitled to unit credit for that unit of graphic production. All persons completing the exams will be issued certificates of proficiency in that subject area.

John P. Morrisohn
Associate Professor, Trade & Technical

11-17-72
TO: Doctor Thomas F. MacKillan
   Administrative Dean, Student Personnel

FROM: James E. Foxx, Business Education Division

PERIOD: July 1, 1972 - November 15, 1972


A. INTRODUCTION

1. On June 27, 1972 information was received advising of the adoption and approval by the Board of Trustees of an Innovative Project for the development of an Audio-tutorial Program in Business Mathematics.

2. On that same date, authority was received from the Superintendent-President to proceed with project development plans as budgeted.

B. PROJECT DESCRIPTION

1. Plan to develop thirty-six (36) slide and cassette tape programs, containing from eighteen (18) to thirty-five (35) slides in each thirty (30) minute program.

2. To develop a model and answers manual to correlate with assigned text and student workbook.

3. To develop nine (9) examinations to test the ability of the students in each of the nine (9) major subject areas covered by the program.

C. WORK DONE IN THE PERIOD JUST CLOSING

1. Slide-tape programs (36)
   a. Cassette tapes
      1) Two (2) tapes completed
      2) Two (2) tapes - copy ready
      3) Twelve (12) tapes - copy edited
      4) Sixteen (16) tapes - rough draft
   b. Slide sets
      1) One (1) set completed and tested
      2) One (1) set - camera ready
      3) Fourteen (14) sets - rough draft
2. Model answers manual (36 units)
   a. Four (4) units completed
   b. Sixteen (16) units - edited and ready for typing
   c. Sixteen (16) units - rough draft

3. Examinations
   a. Nine (9) test "Form A" completed and tested
   b. Nine (9) test "Form B" completed

D. WORK PLANNED FOR NEXT PERIOD

1. Completion and expansion of cassette-tape programs

2. Re-design slides to parallel tape programs in the form of student work sheets

3. Completion of model answers manual

4. To develop nine (9) sets of tests "Forms C and D."

E. OVERALL APPRAISAL OF PROGRAM TO DATE

1. The combination of the cassette-tape and slides program is not adequate for the intended purpose

2. Work sheets or problem sheets should be prepared for students to use while listening to the tapes

3. Tests form "A" and form "B" have a very high difficulty factor. This points the way for the development of tests form "C" and "D" with a lesser degree of difficulty for the average and below average students.
Re: Improvement of Instruction Committee Innovative Project No. 8.

The goal of this research project was to begin implementation of A-T Laboratories for Biology I. The proposed hardware for these A-T Laboratories are Norelco PIP audio-visual modules. These modules utilize cassette super-8 film that is synchronized with and controlled by a separate cassette tape. This A-T system allows great flexibility in preparation of materials and student use. We hope to be able to demonstrate this module in the future.

We have selected a trial laboratory unit, "Plant Adaptations to the Environment." This unit includes an in-lab PIP session and a self-guided botanic garden field trip. Our philosophy on this unit is to provide filmed material otherwise unavailable in the field and to act as a guide for individual student activity during the completion of the unit.

We have completed to date the following portions of this A-T unit:

1. Filming strips.
2. 100 feet of 16mm color movie film, much of which is single framing. (This compressibility is another unique feature of the PIP system.)
3. Outlines for student activities workbook.
4. Audio scripts for majority of laboratory exercises.
5. Itinerary for self-guided botanic garden trip.

During the course of our work some time consuming problems were encountered. Much time and effort were expended in correlating the diverse media inputs for the unit. Secondly, we found after considerable filming that the Super 8 format was unacceptable as an original. Switching to 16mm solved the problems of maintaining near perfect originals, editing, and resolution.

The following work remains toward the completion of this unit:

1. Completion of filming and editing.
2. Preparation of audio tapes.
3. Programming audio tapes to filming sequence.
4. Preparation of student workbook and testing materials.

Respectfully submitted,

Al Flinck

AF/sp

Al Flinck
Bill Jorgensen
I wish to extend my appreciation to the members of the Board of Trustees for making possible my multi-media approach to American history. Like most instructors in my academic discipline, my teaching of American history has been quite traditional from the standpoint of format--lots of lecturing, polka dotted with occasional question/answer periods, and a movie periodically to break the monotony of the class routine.

My proposal to the Improvement of Instruction Committee was initiated by the conviction that my teaching could be enhanced by a greater use of the media--both visual and, to a lesser extent, audio--in my classes at City College. In response to the stipend granted to me, I have to date gathered almost one-half of the approximately 2,000 pictures needed to "cover" the multifarious aspects of the American experience. My plan is to include not only the traditionally historical pictures, but a larger number of other less orthodox, more off-beat or "kinky" views of American culture that would contribute to the student's understanding of the evolution of American society. In addition, music accompaniment has been incorporated into the slide presentation in an effort to increase the student's "feel" for the three-dimensional, emotional part of man's existence--something which has been sorely absent in the teaching of history.

How has my timetable fared since the project was launched last summer? Although my slide collection is still quite incomplete, I have made an effort to introduce the concept to my classes during the current semester. For example, in the first regular class meeting of my large History 5 class in September, I devoted the entire hour to a kaleidoscopic presentation of the entire American experience, showing slides from two carousel projectors simultaneously, accompanied by taped selections from a
wide gamut of music designed to appeal to today's youth. This presentation has been received enthusiastically in all of my classes.

The full implementation of this "new approach" will not occur until the Fall semester, 1973. By that time I will have concluded my sabbatical leave of the previous Spring semester, during which time I am slated to radically overhaul my lectures in History 5. This will be a monumental task, involving much overdue reading and writing. The integration of the slides and music into my course of study will be made complete at that time. My hope is that through the semester my lectures will draw upon specific slides from that introductory hour-long presentation in order to illustrate the themes under discussion in each lecture. Then, at semester's end I will repeat the initial kaleidoscopic presentation, operating on the assumption that the slides/music will then have assumed a deeper meaning to the student as a result of his experience in the class during the semester. If psychologists are correct in their assertion that repetition is one of the most basic learning techniques, then there is reason for believing that this project will contribute to the improvement of instruction.

In terms of profits from the financial investment in my project, it should be pointed out that not only will these slides be used in all of my classes, but that my colleagues involved in American history will have them at their disposal as well. Ultimately, of course, I believe that the students will be the real beneficiaries.

Curtis B. Solberg, Ph.D.
Associate Professor, Social Science

11-17-72
REPORT OF INNOVATIVE PROJECT 1972
By Ralph J. Schiferl

OBJECTIVE OF THE PROJECT

The objectives were to acquire and convert computer programs for instructional purposes. Secondary objectives were to expose faculty, staff and students to the computer language BASIC and to acquire and convert computer programs for non-instructional purposes.

THE EFFORT

The effort of the project dealt with the attempt to locate instruction-oriented computer systems and select the best ones for conversion to our hardware. Fifty-seven letters were sent to other educational institutions seeking computer instructional systems to convert.

THE COMPLETED PROJECTS

1. Conversion of the Purdue Supermarket Game

This game is being used in Mr. Lopez's marketing class this fall. Based on its success as a teaching tool it may be implemented in other classes later. At this time it is apparently very successful.

2. Conversion of the Management Simulation Game

This game is used to teach students the high level management decision making process. We will use it in Mr. Rice's Small Business Management class this fall.

3. The Computer Augmented Accounting System

Accounting students interact with the computer in problem solving applications. These tasks give the student better insight to accounting techniques. Since Mr. O'Dea is on sabbatical leave at this time, use of this system will probably be deferred until the fall 1973 semester.

4. A workshop for BASIC programming was held during the months of May and June. All staff were invited to use the teletype to learn this simple language, specifically
all the math and science professors. Many faculty members, staff, City College students, high school students and teachers, junior high school students and teachers and local citizens made use of the facilities.

STILL IN THE MILL

1. **The ASSIST Statistical System**

This system will provide the student with very powerful statistical calculation capacities. It also would allow the Research Department to conduct very sophisticated analysis of data presently available on magnetic files.

2. **The ECAP (Electronic Circuit Analysis Program) System**

This massive system is being converted as a potential benefit to the Electronics program.

3. **Simulations Systems and PERT**

We have a computer system available that can simulate certain problems or can operate as a PERT analysis device. This system seems to be extremely cumbersome to use. Santa Barbara City College can utilize the UCSB Computer System for problems of this type with greater ease and flexibility.
TO:        Dr. MacMillan  
FROM:      Bruce Trotter  
HE:        Progress Report on Innovative-Teaching Project
            AUDIO-TUTORIAL INSTRUCTIONAL SYSTEM FOR PSYCHOLOGY 1 CLASSES

Background

This is a project that was granted additional funding last year for typing and sound
recording technical assistance. It originated the previous year, envisioned as a
major long-range program to develop a new instructional system for psychology 1 classes.
It grew out of the need and desire to provide an enriched educational experience for
psychology students who find themselves in larger and larger classes. A further aim is
to insure that certain fundamental technical subject areas inherent to this course are
adequately covered.

General Psychology is a course that should cover certain basic technical concepts; but
at the same time is, after all, about human living and personal experiences. As such,
large impersonal classes do not meet this general personal encounter and do not adequatley
provide the atmosphere for free discussion and dialogic exchange. In fact, there is
also a question as to whether the large lecture section method lends itself well to "basic-
fact" material acquisition.

Out of these considerations a conviction grew that some type of creatively-presetened
individualized learning program which places more responsibility upon each student to
learn basic concepts, would alliviate the dilemna. It was felt that if the material
were presented in a fresh and exciting manner, the "nuts and bolts" aspects of the course
could be learned well through the programmed approach, and more instructor time and effort
could be spent in small group discussions. This would enhance personal exchange and
allow for an emphasis upon a consideration of the relevancy and application of the
material learned.

Characteristics of Instructional Material

The material consist of programed workbooks and separate cassette recorded lectures for
each lesson. The tape recorded material coordinates with the exercises and written
work the student does in the programed workbook. The workbook is designed in the branching
program format so that the student's interest is kept active and his individual needs met.

Present Status

The system is not yet in full classroom use. Not all of the lessons have been typed,
duplicated, and tape recorded. There have been production delays resulting from frustrating experiences involving the necessity of depending upon technical support workers.
We've had some problem finding a student typist who is skilled enough to handle the presice format required in branching programs. The LRC at the University has consented
to record our master tapes in their sound studios, but they are in the process of moving
into new quarters, so that will be delayed. Our duplicating room is swamped with work
so the printing of the workbook to be sold in the bookstore will be worked in at a later
date.
Some of the materials are being field-tested on a limited basis and revisions made on the basis of feedback evaluations. Although no formal study has been made yet as to the effectiveness of the material—on the whole, students seem to like it.

Phases of Development

Many operations are needed to successfully bring a program of this magnitude into being:

1. The basic course content had to be decided upon. A survey study of other colleges teaching Psychology I, discussions with department co-workers, and reference to ERIC files all contributed to decisions concerning what topics should be covered in a General Psychology course.

2. Performance objectives had to be drafted for each lesson.

3. Written branching programs constructed for each lesson.

4. Tape recorded lectures produced for each lesson.

5. Alternate forms of post-tests constructed for each lesson.

6. Evaluation and student feedback procedures initiated.

7. Provisions made for revisions of the material on the basis of student feedback information.

8. Final formal testing and evaluation of the entire system will be set-up with the help of Dr. MacMillan.

Future Spin-off Possibilities

It is hoped that since the material for Psychology I is being organized into meaningful learning units, this material might be adapted and expanded for use in community T.V. Cable T.V. in Santa Barbara is now required by law to broadcast a certain number of community service and educational programs. They are anxious to find sources for high-quality educational programs and will supply free air time. Dr. Gooder has put me in touch with the people at Cable T.V. to explore the possibilities and apparently they are interested.

Because of its high interest value and because it is required in so many courses-of-study, Psychology is an ideal subject for a community college-credit T.V. course. Other communities have offered Psychology on T.V. for credit with much success.