Education

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Selected Alternative Programs for Bringing the Real World to the Undergraduate Classroom

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This session assumes that undergraduates need exposure to the real world. To be honest, I am not uptight about that need. Good education mandates relevance. But relevant education involves much more than most of the "real world" discussions I hear. Affluence means more than material goods. If education is to add appropriately to our affluence, it must conceive of the real world as a many splendored thing. Actually, the topic of relevance begs for priority in my remarks, but discipline will keep me primarily on my assignment.

Professor Snodgrass has done well in laying out some philosophy and history bearing on "real worldism",(36). He has blueprinted well the student intern and coop plans. Where he looked at taking the students to the real world, I will look at bringing the real world to the students. I will say a bit about preparing a student to be a prepared realistic citizen - a relevant student, if you will. I will try to cover alternative programs of: Games and Simulators, particularly computer-based ones; Computer assisted instruction (CAI) and such modern computer applications; Programmed learning and audio-tutorial methods; Case studies; Class visitations and selected audio-visual techniques; Field trips; Special problems, projects and theses; and a few miscellaneous

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approaches to realism. Admittedly, use of these techniques may not be synonymous with giving student relevance, but the association is close.

Making Students Relevant

Relevance is defined primarily by the beholder. If I had a text for this paper, it would be "Learning to Be", taken from the great UNESCO study of that name, (11)[b]. Learning must be universal and without time. The relevant student has been taught how to continue to learn with others throughout his lifetime.

I am patently unimpressed with the product specifications for recruiting undergraduates laid out by many employers. Usually the employer wants a student with a list of personal, professional and environmental characteristics never embodied in one young person. Professor and employer are both ill advised to expect a student to be all things to all people.

An information matrix of employer and professor information relative to placement and training was designed, (Figure 1). This is not to design university curriculum or industry training programs, but regardless of which "real worldism" alternative we may choose, some issues stand out. First, even if Figure 1 exhausted the relevant items known by both parties, each has plenty to bring to bear on student placement (and training). Second, professor and employer must each stick to those items he knows

Figure 1. An Incomplete, Illustrative, Informative Matrix for Employers and Professors Dealing In Agricultural Economics Undergraduate Placement (and Training)

What Average Employer Knows

1. In-depth knowledge of what makes his organization tick.
2. Type of man that has advanced in his organization.
3. What the University was like when he was in school.
4. Possibly which schools are doing a good job now.
5. Discipline of meeting short-term deadlines.
6. Value of knowing at least a minimum amount about a lot of things.
7. Value of common sense.
8. Value of organizational political know-how.
9. How to obtain a limited set of objectives.
10. Value of organizational loyality.
11. The differences between line and staff responsibilities.
12. What effect outside forces have on his organization.

What Average Employer Does Not Know

1. The sophistication of university personnel evaluation and knowledge.
2. Neither the general high level, nor the range in potential of students.
3. The flexibility and adaptability of well trained students.
4. What other organizations are doing generally and specifically, about personnel choice and management.
5. The latest in technique of analysis.
6. The long-run planning process.

What Average Professor Knows

1. Superficial knowledge of what makes many organizations tick.
2. What types of men have advanced in organizations generally.
3. Educational philosophy, objectives, techniques and methods.
4. Some reasonable valuation of several schools.
5. Rigor and value of scientific analysis.
6. The power and limitations of generalizations.
7. The latest in techniques of analysis.
8. The discipline and humility of subject matter specialization.
9. The macro setting of many organizations.
10. The richness of new ideas generated in the luxury of non-partisanism.
11. How to work for many bosses.
12. The luxury of worring about the long run.

What Average Professor Does Not Know

1. How to place his students.
2. What students are really getting in the University outside the professor's area.
3. Up-to-date organization technology and changes.
4. How to make concepts and tools operational.
5. Industry politics and unique employee constraints and opportunities.
6. The short-run necessities and expediencies of modern organizations.

best. Third, the professor's advantage lies in educating the student rather than in serving as an educational attaché for the student in the real world by someone not professing to be a teacher. Professors know more about education than employers. Fourth, the imprint of the good teacher is usually a mixture of personal and professional. Even if a professor had four years with any given student, it would be a short time to transmit such elements of good education. In fact, my main argument for methods improvement is to gain efficiency so students can get more of the personal and professional tone of the professor. Fifth, the university is a minicosmos of these professor-type things, and fours years is inadequate exposure of students to the "real world" of a good university. Sixth, the uniqueness needed for the first job is obviously in the comparative advantage of the employer. The public has no reason to pay for this training. Seventh, many general items expected by the employer of the student can be taught best by the professor. Eighth, a good university can afford the variety needed of such things like ideas, research, technology and philosophy because it can spread the cost of these over many students. Typically an organization can not. Ninth, any professor worth his salt has enough knowledge to motivate and excite students for the short time he has them. Tenth, any university worth its salt has enough excitement to compete in learning with any outside organization.

Alternatives for Bringing in "Real Worldism" to the Class

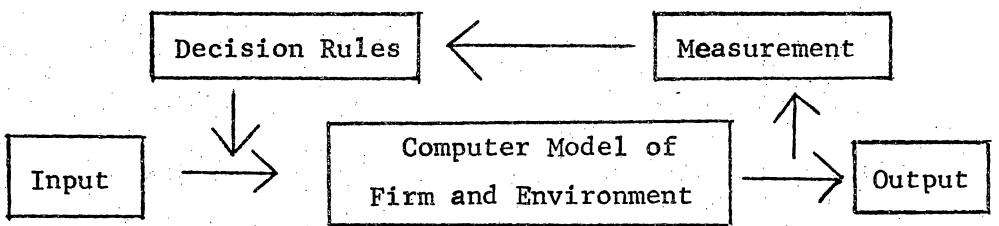
This section emphasizes sophisticated tools and techniques. Let me preface it by saying that these are not the only ways to get such realism. Bob Taylor puts it this way:

> " . . . The easiest technique that the professor can use to bring relevance to the classroom is to sprinkle his lectures liberally with up-to-date examples from the world. One principle and seven examples is about the right ratio. Every time that the students ask about this again always bring up a new example. This is a technique for bringing relevance to the classroom and for building motivation that can be done by each professor without a great outlay of expense or time-consuming materials."

Games and Simulators, (10,5,26,14). Let us acknowledge that all computer and analytical methods are not games and simulators. Also, all games and simulators need not be computer-based. Buying and selling problems in prices courses, auctioning off an unknown number of candy bars to establish a demand curve, and commodity games in marketing courses are examples. These can be complicated or simple. For example, consider a farm management game to teach tenant and landlord bargaining and contract preparation. Part of the students are given characteristics of a tenant. Others are given characteristics of a landlord. They

are graded on their selection of a partner and validity of their contract. The clincher is that there is half again as many tenants as landlords and those who cannot make a deal presumably fail the exercise! This game does not need a computer to get motivation.

Babb describes a management game as "a dynamic case study"(10). He illustrates it as a model representing an organization or part of an organization usually in a competitive environment where subjects manipulate decision variables to achieve objectives as illustrated below:



Not all games are management oriented, but Babb lays out what can be taught with such games.

> "Management games are quite flexible in terms of what can be taught. They have been used to teach basic management concepts such as planning, control, organization and coordination. They can be used to demonstrate economic principles and are especially effective in the area of imperfect competition where

we can say less about behavior and performance. They can be used as an exercise to gain practice in the use of analytical tools such as sales forecasting techniques, cash budgets, profit-volume analysis, ratios, investment analysis and the like. They can be used to demonstrate the strenghts and weaknesses of various organizational schemes and to improve human relation skills. They can be used to teach a subject his role in and contribution to a complex organization and to give him a view of the way the parts fit together. . . . . Last, games have been used to teach subjects about organizations with which they deal so they can be more effective with them,"(10).

Simulation differs from games as defined by Babb and Eisgruber:

" . . . mathematical models differ from simulation models - the first are error-free (analytic), while the latter are non-error-free (non-analytic). That is to say, simulation refers to a formalized system where the rules of validation require a sampling of the relevant entities.

"In business games, the process of simulation is periodically interrupted, and the human decision-maker (or decision-making team) modifies earlier decisions in the light of new knowledge gained

from results of earlier decisions, (5,pp.15-16).

I will not belabor the place of games and simulators. They are only on the threshold of their potential. They are proved, available, flexible and motivational. They can be made realistic; the many lay people that have played them have affirmed this repeatedly. Computer games and simulators are bringing "real worldism" to the classroom just as they have brought "real worldism" to the real world. In that difficult area of behavior, they probably have no teaching peer.

Simulation has great conceptual strength for "real worldism". Public professional education was to prepare people for the real world. It was a bold, expensive simulation. By conceptual standards, the historical form of education is woefully inefficient as compared with simulation.

Computer Assisted Instruction (CAI), (2,37). The grand application of CAI staggers the imagination. Its potential has long been accepted. Its cost has been the problem, (2), and cost will continue to preclude its availablity in many places, but needed applications are possible without a total campus CAI setup. Once a campus system is installed, like the great Plato system at Illinois, (2), the agricultural economist can no longer avoid trying CAI. Glenn Himes and associates at Ohio State are to be commended for getting started, (15). They received a windfall from their extensive medical school applications. I

also understand that Kendrick at Nebraska, Gorman and Capener at New Mexico, and people at Georgia and Florida are working with CAI. Most applications in agricultural economics are in simple material and usually in only a portion of a course. We will build up. The diagnostic potential staggers the imagination. We should look specifically at our statistics courses, (38). The variety of fallouts will be exciting. For example, Ohio State is setting up a bank of up to 4,000 examination questions where an instructor can construct and print-out tests giving information on when the question was last used, how the students did on it, and such. Student reviews from such a system are obvious.

CAI is gaining in large systems such as in California, (23), and New York. It fits high cost areas, such as medical diagnostic work. The analogy is clear for many of our courses, especially management. It has potential for nearly any case study setting. Integrative issues of our discipline provide fertile ground for experimentation.

Systems such as the Ohio State medical programs allow adaptation for on-the-job training such as for paramedics. Scheduling groups away from duty stations was a problem which the hospital could not handle. The individualized nature of CAI allows such training to be scheduled into daily routine.

Development of computer-based information retrieval systems captures the mind of any scholar. Corrollary uses of information

retrieval systems and CAI are myriad. Research, CES, and teaching interactions mandate serious experimentation here.

Alpert and Bitzer, (2), discussed three misconceptions about CAI. One that, "Since the instructional strategy must be previously programmed on the computer, it must of necessity anticipate all conceivable student responses so as to compare them with 'correct' answers stored in the machine." They claim that, "Teaching strategies which do not call for specified student responses are widely used and often of greater value in many fields and at many levels of instruction." We do not have all the answers in any system. Our teachers now believe that their goal is learning with the student as contrasted to teaching him. They have no trouble relishing this open-end aspect of CAI. Anyway, completely self-centered systems could be stifling. Remember Professor Galbraith's defense of a bit of ambiguity, "Had the Bible been written in clear, straightforward, noncontradictory language and had the language been constantly modernized to accord with contemporary tastes, it would, almost certainly, have been, or have become, a work of little influence," (12). CAI is systematic and additive, and has advantages over many historic ways professors try to improve their courses.

Another misconception is that "Computer-based instruction may be useful for the transfer of information, but it is not of value in the development of critical thinking." Alpert and Bitzer

contend that "Computer-based instruction has often been found to be more effective than standard educational procedures in many learning situations that call for judgement, interpretation of complex problems, and evaluation by the student of the validity of his conjectures . . . Obviously we have proceeded far beyond the role of the computer as a bookkeeper, scorekeeper and guide to selected textural material." Heuristic developments with the computer emphasize this notion.

Third, they challenge the misconception that "A computer system used for computer-based education cannot be used in a time-sharing mode for conventional computer programming." They can be casual about this with the multi-millions that NSF dedicated to the University of Illinois specifically for CAI. But, the versatility of hardware is staggering and growing. Many are agreed that successful student-computer interaction depends upon proximity and quick turnaround. CAI has both. We have time for the hardware to catch up while we are checking out a wide range of simple experiments with CAI.

This CAI discussion is superficial. Coverage of such innovations is not easy to define. For example, classroom use of such techniques as the touch-tone telephone in the classroom is important but not really CAI, (17). We must follow applications in many areas. Elementary principles teaching offers widespread use. Chemistry, (32), mathmatics, possibly English grammer and

spelling may be revolutionized. We should watch for CAI developments in areas of high cost intensive education such as medicine and law, (13).

Programmed Learning and Audio-Tutorial Methods, (39,28,40,27,22,4,20,30).

My selection of techniques here is only illustrative. Programmed learning has undergone the traditional and often lethel partisan conflict. Educators and psychologists have filled many journals about it. The excitement was with the system of the approach. The ideas have been felt in many multi-media approaches and they live on although not so specifically named as before. The specific applications have been somewhat simple and probably more adapted to elementary than to higher education. The ideas are sound and one should understand their background to understand many of the current developments.

Alpert and Bitzer, (2), question a misconception that "Computer-based education is synonomous with programmed instruction." They hold that, "Computer-based education makes possible unprogrammed instruction or student-controlled learning by utilizing teaching strategies which differ completely from the basic tutorial logic of most programmed instruction. While of substantial value for the development of certain skills, the interchange of factual information between man and computer is only one mode whereby a teaching strategy may be incorporated into the computer."

This Association looked at audio-tutorial methods. A let-down and lapse can often follow a flash beginning, It is now time to reassess it. So many first courses have been put on audio-tutorial that some universities have been getting student resentment. They like some, but they want variety, particularly in their first year.

Programmed and individualized methods can bring great realism to classroom or laboratory. They personalize realism. They force rigor in the presentation, (39). The ideas are sound, but expensive and possibly prohibitive if one thinks he must program the whole curriculum. We must be selective. We must consider these techniques for at least sections of our principles courses. Many small loops have a place. Kendrick, et. al. at Nebraska have a large library of the most often asked questions where students can listen to the answers repeatedly and face no instructor wrath. The answer is better thought through than most oral answers. Taylor and Bohl at Purdue have loops on general interest topics outside their office so waiting students can dial in and learn while they wait. These are simple applications, but the start is made. The approaches are a natural for prerequisite material.

Audio-tutorial material in a Purdue farm management short course was often taken home for Dad to study. We have the potential for CES applications. All one needs do is look at the subscription services available to professionals for cassettes and

other self-study aids. Some are showing up in the agriculture.

Case Studies, (24). Three types of cases have evolved: Business School (Harvard), Law School, Agricultural School (farm management). Type chosen and use made should depend upon teaching objective.

The Business School case ("Here is a situation, what do you do?") has been effective. Its elite lineage gave it widespread use often without questioning its objectives. It had original objectives which may not fit our classes today. One objective was the fostering of student interaction and learning from probably the most expensively recruited, most systematic diversified and most brilliant group of students ever assembled. These students brought great realism to the classroom personally. The trick was to render and distill it. Another objective was to teach about macro settings of problems, often as known by the students. Another objective was to allow the professor a teaching advantage because he was imbued with great personal knowledge of the case. These unique characteristics raise questions about wholesale use of the case by us.

Eric Oesterle at Purdue holds that two types of management cases work. One is a short, incident type case which reinforces a specific point or principle. It is short enough that students read it. The other is a detailed, well documented case which students are forced to read, but one which impresses them with

what facts and good analysis can give. Further, his classes are briefed on current status of the institutions in the case by an assigned group in the class. He believes in a resource person from the company or for the area, if an area such as antitrust or taxation is being studied. This person, in person, or by tele-lecture, is a resource person, not a lecturer.

The Business School case is often borrowed. An agricultural economist who borrows such a case must evaluate it correctly in terms of his course. Many such cases are probably too inefficient and beyond our teachers and students. The answer is said to be development of cases of this type which are agriculturally related. This is expensive and must be compared against alternatives.

The Law School case ("Two sides of this question exist, find them, and practice upholding each.") is a somewhat more limited case. Its use is widespread, but its evaluation among law faculties is not all positive. Admittedly, it is used more for student practice than for bringing in realism. Obviously, the better the instructor, the more realism.

Issues of contrast or adversary can be handled in our classes with this type of case. Pricing and marketing, policy, and group decision courses are obvious candidates. Our students are often too partisan; forcing both sides of an issue could enrich our programs. It might also force professors to be more objective! Most of us resist outright acceptance of the idea that we should

teach communications. But "taking first one and then the other side" in an adversary role is a technique which will give some good communications training.

The Agriculture School case ["Here is a real situation (analytical framework). Let's make these assumptions. Now what will happen (partial analysis)?] ". The main objective is analysis but we are teaching such within a real life setting. At times we may also be teaching subject matter with the case, but that objective should be explicit. To be most effective, each case must be placed in its proper perspective in the real world.

Our people differ on techniques to buttress case analysis. Some still feel that you need depth layman input by field trips or class visitation. Backup data, economic history and colored slides may accompany the case. All should be sequenced into the partial analysis.

Cases demand good, and possibly experienced and unique, instructors. Cases must prove their worth for a given situation - their honeymoon is over. Cases will not prevent instructor bias; they in fact may have a weakness here. Cases are often expensive. Cases are not automatically relevant. A joint relationship of a case and the computer (or other techniques) is the promising way. Cases are abundant; a systematic clearing house for agriculture cases would add realism. Cases must provide for student interpretation and improvement. Contrasting cases can be effective.

Case realism depends on many things. One of the most important, is the professor's understanding of the case.

The case will probably continue for some time to be the most effective way to bring realism to agricultural economics courses for many professors. Cases probably fit many simple applications in smaller, less endowed departments or those who do not have large undergraduate enrollment. The best departments will use cases but the cases will become more sophisticated, technologically efficient, and better integrated into the specific objectives of the courses. Professors may also wish to remember that they, as well as their courses, are often viewed by students as a series of case studies!

Class Visitation and Selected Audio-Visual Techniques. This category is heterogeneous. My brievity will undoubtedly render disservice to some techniques.

One of our instructors feels class visitation is a necessary transition as we move from field trips to improved technology. He likes a 50 to 90 minute, eyeball-to-eyeball contact by student and manager. To encourage this, he refuses to answer any questions about the case after the visitor leaves. Others argue that you do not need that much time and it is often impossible. They feel the eyeball thing is exaggerated. I expect technology will win out in the end, but we may not be there yet in detailed subtle cases.

A case situation is almost always needed for a good class

visitation. We say, "Never let a visitor lecture - control the interview, or better yet, let the students do so." The old "visiting fireman" does not even deserve discussion.

The tele-lecture is effective, especially for illustration of a single point. Many are using it, (18). It is probably limited for analysis. It can open up discussion, but the instructor must know the personality interviewed and the situation well enough to handle questions once the interviewee is gone. Multiple interviews of 10 - 15 minutes, often with contrast, are most used. This technique needs wider use and your telephone company representative can assist you.

Video tape is increasing in use for short illustrations. It can complement the class visitation and/or tele-lecture. The large film may be too expensive, so applications should probably be thought of as small and well selected. Film generally has great obsolescence (or at least it should have). Slides well done have flexibility and costs can be reasonable. Slides are effective for handling seasonal sequence problems. Also, contrast is quick and effective. Quality is the key to slides or other realism supplements. Aerial pictures, for example, are now reasonable and can supplement ground level slides in resources planning, farm management and appraisal courses.

Techniques in this group are dependent upon the imagination of the professor. Also, we need greater availablity of technical

preparation. Preplanning for each is important. Most of these are proved, flexible and realistic.

Field trips. Field trips are nearly obsolete because technology of film and electronics has outstripped the efficiency of transportation and logistics. Not everyone agrees, for example, Bud Stanton, Cornell, wrote:

> " . . . We still believe that field trips are the best way to teach farm appraisal and farm management. It is increasingly expensive, but the student response in field is a very important part of the learning process. In marketing we have phased-out field trips and brought managers of businesses to the classroom believing that work experience and case studies are a better way to get some sense of management and real world problems."

I still think they are obsolete. Students do not consider their time sunk, and at the disposal of professors. They expect more than riding around in a bus. The professor should look at the time input he has in well planned field trips. He should add to his cost, the time cost of 100 students who are dragged across the countryside, or thru the urban traffic interchange and topless night clubs. This time could buy a lot of realism elsewhere. If students want a joint social-educational jaunt to town or to the countryside, they can arrange it as a club activity. Many are

doing that, and they can find industrial sponsors.

Special Problems, Projects and Theses. The old farm management class "home farm" problem gave realism. The concept is alive and getting exciting modifications. Students today make claims for, and are willing to give of themselves for, projects of realism. Such programs as the Peace Corps and VISTA attract to this. A good professor can capture this in projects or problems.

Professor Downey of Purdue has his business management students ride a sales route. The "Day With a Salesman" program is popular with salesmen and students. The student must describe the day, and show how specific principles from the course did or did not relate to his day. He must evaluate the salesman, with a written report to the salesman. The salesman also evaluates the student. Feedback on special projects is significant. All students do this project so it becomes an evaluation of course reality. For most students, the salesman is no longer "just a salesman".

Martin Pond of Pudue has had success involving his community development students with community leaders. Their input is used. For example, they have done interdisciplinary landscape architecture and economic planning of community facilities. Other departments reported new adaptions, and interest in these devices for getting realism. The ideas are flexible and feasible.

Many students acknowledge special problem experience as

their first real adult experience. They have never had the pleasure, or obligation, of being considered an expert or of being a representative of a large organization such as the university.

Cost, especially in professor time is a problem. A cost-benefit analysis is recommended. Standardization of projects helps to focus them more directly on the specific relevant section of the course. The class project where all students go together to evaluate a problem such as the future of a local business or community institution is gaining in use. This can save instructor time. Some are using the special project as a student option, often to raise a grade. As usual, however, good students opt for the program, poor ones who do not. Adults and students could work together on special projects if we would be more liberal in letting undergraduates into short-term intensive CES courses and workshops.

Some renewal of senior theses is reported. The thesis objective should be made clear. If the objective is preparatory for graduate work, opportunity cost of other material should be considered. If the objective is realism, the thesis should be planned that way. A series of varied special projects or mini-courses may be more effective, (29,31).

A Few Miscellaneous Approaches to Realism. Intern or coop programs encourage "real worldism". The length of time may be

varied. Many short-term, one-day-to-summer-length involvements are being tried. Better summer job placement can put students in somewhat realistic settings. This takes planning and organization of students and employers. Students are probably going to do this anyway - if it can be made more realistic, great!

Television may be an effective device for realism. But it is probably coming in for other reasons, primarily efficiency. When it is available we can hitch-hike on it as a vehicle for relevance. Relevance will probably not be a major motivator, however.

Student businesses, either in the social context of Berea or in the private context of the FFA National Farmer with three sections of land, give realism. Where the professor has such a demonstration, it is a good opportunity and challenge. Experimentation in student farms or businesses such as the Iowa State Student Farm, is not on the increase.

Student work programs in departments give some students realism. Often such programs have directed students into graduate work, and this is not necessarily the most effective route to "real worldism"! Student work programs have greater potential for realism. Objectives of these programs are diverse, and planning is poor.

Alumni or other advisory boards are being used, and student involvement can give realism. The Kansas State curriculum revi-

sion project reported by Sjo, et. al. is an example, (35).

Undergraduate students at Purdue enjoy a meal and learn from on-campus conference participation. The program evolved during student uprising days as a public relations thing to acquaint lay people with real live students. The exercise is now widely used and liked by students and conference people. Mostly the students interact with the conference participants at meals. Often tutorial teaching by the students evolves. Also, students can make key presentations at such conferences. Their batting average is better than that of the typical array of speakers. Their peers learn realism by observing them.

Seminar discussion courses can be an effective way to get realism. But, the typical seminar with an outside person giving a lecture is not what I mean. Seminar leaders from both outside and inside can be effective if the objective of realism is explicit.

Issues of where and when to use various approaches within any individual course are important, but space in this paper precludes an indepth discussion.

CURRENT USE OF ALTERNATIVES

In July 1974, a questionaire was sent to 52 universities of which 45, or 87%, responded. The first question was, "Are you concerned about your undergraduate students' being poorly prepared for entering the real world when they graduate?" Thirty, or 67%, said, "We work at it and are fairly well satisfied."; Thirteen, or 29%, said, "We work at it but do not do a good job of it."; and two said, "We don't worry about it." Again I wonder if we have defined an overpowering problem.

The next question was, "If you are working at preparing your undergraduates for the real world, briefly describe the kinds of things which you do to try to get them prepared." Most reported a combination of activities, varying from institution to institution. Another question asked what proportion of the undergraduate instruction was built around each alternative. Some problems with survey definitions were obvious, but the data are helpful, (Table 1).

Various departments answered with such things as: "We use teachers who know and live the real world."; "We evaluate our curriculum often."; "We involve our students inside and outside."; "We prepare them to get and hold a job - not in the vocational school sense, but with a dedication to work, team and service in a competitive environment."; "We stress <u>both</u> principles and application in courses."; "I do not think the University is a

Table 1 - Use made of various techniques for bringing real world situations to undergraduate students, 52 U.S. four-year Agricultural Economics programs, July 1974.

REAL WORLD TECHNIQUES	% of Depts. using the technique	Avg. proportion of undergraduate instruction built around technique among those Depts. using the technique.[c/]	Range in proportion of undergraduate instruction built around technique among those Depts. using the technique.[c/]
Computer applications of any type	98	9	3 - 25
Computer assisted instruction (CAI)	12	NA	NA
Programmed learning other than the computer (such as audio-tutorial systems or teaching machines.	35	4	2 - 20
Case Studies	90	9	3 - 30
Special problems & projects (with actual, significant, real life exposure.)	83	8	2 - 25
Field trips	88	5	1 - 17
Class visitation (by non-academic type people.)	93	7	1 - 40
Tele-lecture and similiar approaches (with or without slide or film back up.)	24	4	2 - 7
Slides or films (without class visitor or tele-lecture.)	62	6	1 - 26

Other Activities Mentioned, but Proportional Use Unavailable

- Counseling about real world matters
- Alumni evaluations
- Summer employment programs
- Undergraduate club-real world activities
- Undergraduate participation in university conferences
- Department work by students on real world problems
- Seminar thesis
- Seminar & seminar courses designed in this direction
- Students running their own businesses & farms

c/ Some problems of definition damage these data. Some people obviously reported the proportion of courses as contrasted to the actual proportion of instruction. Where this error was obvious, the data were adjusted. Thus, the data are obviously biased upward as to the proportion of instruction so built around the technique.

world apart from the real one."; and "We have always had 99.44% of our seniors employed upon graduation." My bias reads these as mild resentments about the need for "special" programs to get relevance.

Many do feel that direct attention to "real worldism" is important. Variety and widespread use of various programs speak well for our professors. However, my impression was that people in most departments were concerned more about out-of-date teaching and about failing to do as well as we know how, than from lack of ways to handle realism. Many approaches sounded old fashioned. The small number of departments using modern tools - computers, programmed learning, tele-lectures and such - was distressing. Comparative data in other disciplines are not easy to get, but a universitywide Purdue survey showed over 60% of departments using these newer, more technologically oriented approaches. One national survey showed computer use to be pervasive, (1). Given the norms I have, results of my survey bother me. I feel that about one half dozen departments are doing a good job and the rest are not.

The computer is not synonymous with bringing "real worldism" to the classroom, but it has proved itself as a modern, efficient means of doing so. It was heartening to see that nearly all departments (98%) were using the computer in undergraduate work. However, only 46% required even one computer programming course and

only five had made even the most rudimentary applications of computer assisted instruction (CAI). Only 48% were using the computer to score examinations and to feed back examination analysis. About 85% used the computer in course and instructor evaluations. These applications are peripheral, but their limited use indicates lack of sophistication with the undergraduate program of a type probably not tolerated in research. About two-thirds indicated more computer use in graduate programs than in undergraduate programs; about one-third indicated considerably more. Essentially all reported computer use with class exercises, problems, simulations, games and such. Yet, one-half said that very little or none of their applications involved direct student-computer interaction. Departments with computer-based problems and games reported an average of only 20% of their courses employing direct interaction.

Information on computer application is flowing among departments - two-thirds acknowledged getting substantial material for undergraduate computer use from other departments. One-half said that they receive valuable computer class materials from CES and AES applications. One-sixth acknowledged classroom material from staff consulting. However, about one-half said that undergraduate and CES materials in general (not just computer types) were interchanged little or none at all.

Recommendations

Take Professor to Real World. Professors who are tuned in to reality can bring the real world to the campus. They have demonstrated this time and time again. The efficiency of sending the professor rather than students to the real world is economically logical. Moreover, the professor must validate what he is teaching. A professor can always test his need for this by giving an open book test on some real world issues. Industry supported short-term exposures of professors have had good evaluations. Also, we have a place for more well planned industry sabbatical leaves.

Make Department Real. People become real only if their environment is real. A department must assess realism of its program, people, and facilities. Allow me another word about Purdue. Our realism in undergraduate instruction comes naturally out of a total philosophy of departmental realism. It assumes preparation of our students to handle this environment. For example, we assume a high level of quantitative training, (21,pp.102-107). But, environment is necessary to make such background real. We do not emphasize differences among researchers, scholars, theorists, quantitative specialists and adult educators; we call them all professors. Our joint appointments aid substantially. Our best undergraduate teachers can do good research, and in several instances, they are our best adult teachers. They have been abroad. They can teach graduate students or supervise graduate

theses. They do consulting. Our programs are departmental programs, not CES programs, international programs, AES programs, or teaching programs.

Realism is difficult enough with all working at a high professional level. It can rarely be established parochially for undergraduate instruction by special programs. Let me emphasize this point by saying that I feel my paper is essentially relevant for adult educators as it is for undergraduate teachers. Fortunately, teaching technology of the future will mandate complementarity of teaching, research, and CES to spread the cost.

Bring Professor and Profession Together. Two points are relevant. The first is articulated by John Sjo in AJAE, May 74, (34). Undergraduate teachers apparently think they are being shunned by the Association. Frankly, if they are disinfranchised, I have a feeling it is self-inflicted. I agree with Boulding:

> "There are no recognized tests by which economists can be distinguished from those who may claim, but who do not deserve the name. We have no professional qualifying examinations as do the lawyers, the doctors, the accountants, and in some places, I understand, the beauticians. . . . . We do not even follow the practice of so many professions in improving their economic status by raising barriers to entrance. We may understand monopoly, but we certainly do not practice it, (7)."

Undergraduate teachers were involved in the formation of this Association. They are an important group. If we have a problem, we should correct it. Neither the Association nor our professors should be out of touch with reality. Our students deserve a forum of respect for teachers. The profession must be a vehicle for defining and reinforcing reality.

The second point is more positive. It has to do with the "fourth revolution" in education as so well stated by The Carnegie Commission on Higher Education book, The Fourth Revolution,(3):

> "The first revolution occured when societies began to differentiate adult roles, and the task of educating the young was shifted, in part, from parents to teachers, and from home to school.
>
> "The second, was in some places antedated by the first, 'was the adoption of written word as a tool of education.' Prior to that time, oral instruction prevailed, and it was only with reluctance that writing was permitted to coexist with the spoken word in the classroom.
>
> "The third revolution came with the invention of printing and the subsequent wide availability of books.
>
> "The fourth revolution, in Ashby's view, is portended by developments in electronics, notably

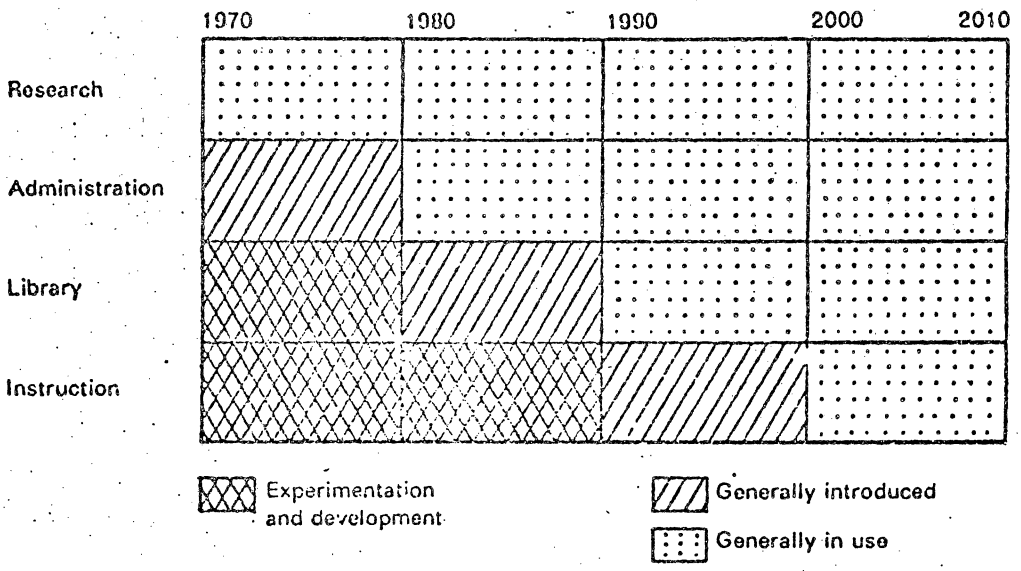
those involving the radio, television, tape recorder, and the computer, (3,p.9)."

My contention is that undergraduate teaching will get its greatest thrust for realism as this revolution occurs. The Commission concluded: "Higher education (and education generally) now faces the first technological revolution in five centuries in the potential impact of the new electronics, (3,p.1)." They do not expect significant effect from this new technology on teachers until the 1990's, (Figure 2). I expect it sooner.

Teachers have a great future! Most research-oriented professors have had their batteries charged already. Some CES personnel have. Teachers are being asked to look at institutional changes going on outside education, (9,p.33). They must also look at technology within the Land Grant troika, especially in research. Elementary teaching improvement is credited substantially to the science community (6,p.107). For the most part, the awakening to technological sophistication has not permeated teaching (1). It must. Every undergraduate teacher should have read the Carnegie Commission Study by now.

The main social reform affecting education is accountability, (25,p.53). It will keep pressure on. Fortunately, we have the technological hardware coming into proximity with our students and staff. We are getting needed quick turnaround. Our new teachers can put an arm around a computer. Technology and accountability

FIGURE 3. *Estimated use of electronic technology (computers, "cable" television, videocassettes) in higher education*



SOURCE: Staff of the Carnegie Commission on Higher Education.

are going to give us undergraduate teaching realism. Hopefully, such realism will not have to wait for a new generation of teachers.

Diversify Approaches to Realism. Realism is a quality ingredient of education, distilled out of professionalism and scholarship of the highest order. Any technique or program which helps an individual professor transmit realism or helps him teach a student how to recognize realism is to be considered. Departments must work out their own mix with thought and planning. Priority criteria are becoming available. Hopefully, this paper has put some of these in perspective. Much is happening and the place of specific techniques and ideas is impossible to predict. Lynn White said, "If one goes back sufficiently far in history, attempts at technology assessment, had they been undertaken, would undoubtedly have been consistently wrong, (16,p.413)." But, pervasiveness of technology and its professional effects on science leave no doubt that a similiar happening is ahead for education. The concepts of flexibility and innovation discussed by Carroll Hess are important, (19,p.5). Diversified attacks will be needed. For example, the intern programs average about 6 student per year, (36). Designating a few students for such programs somewhat as a scouting party for professors and other students is obviously worthwhile. Frankly, I do not see wholesale movement in that direction. Programs that concentrate on bringing realism to the class make more sense to me. But these will do little unless we have professional professors.

Cherish the Four Years We Have. Our responsibility for realism is massive, but, it is not ours alone. For example, the Special Commission on the Social Sciences has urged "Officials in business and labor organizations to strengthen and broaden their existing association with the social sciences, (8,p.XVI)."

Many of us vary on the purpose of education, but most of us know we have a huge job to get across the general ideas of: 1) developing the discipline of thinking. (A former student, now a company president, told me the other day that the best thing we can do for the real world is to teach students self discipline), 2) conceptualizing with varying degrees of abstraction the situations within which analysis by thought or otherwise takes place, and 3) bringing to bear wisdom of the past, theoretical generalizations, analysis techniques, and means of creativity on problems of working and living.

Our capacity to contribute should be substantial. Exposure to "real worldism" of the university is a sacred privilege for a few. Tasting the uniqueness of the university is a once-in-a-lifetime experience. Four years is preciously short. We should selfishly cherish and defend our short exposure to our students. The rest of society has them for a lifetime. If we want to figure in that lifetime, we must, while we have them, teach them how to "learn to be". This unexpiring opportunity for learning is not to me a maintenance concept such as Schultz and others have claimed, (33,p.3-31). It

is our opportunity to compound the accumulation of human capital by learning. Let us practice our special expertise in the art of learning with our students while we have them.

FOOTNOTES

a) Help on this paper was much more generous and profound than the final result indicates. Thanks to those who returned my questionaries and special thanks for detailed letters and comments. Also, I acknowledge M. M. Snodgrass, New Mexico State University; Wayne Purcell, Oklahoma State University; R. Suter, R. Taylor, D. Downey, P. Farris, L. Bohl, R. Schneidau, E. Osterle and W. Boehm, Purdue University.

b) References indicated by such numbers in parenthesis, refer to that reference in the Bibliography. I have not referenced all the many seminars, workshops and such, but I was impressed with the University of Florida workshop, (41). My priority reading assignments for this paper are Learning to Be, (11) and The Fourth Revolution, (3).

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