

Jennings Bryan's "Cross of Gold" speech. It was mentioned in their history class, and they asked to hear it. There are music groups, dramatics classes, sewing and cooking for boys and girls, wood shops for boys and girls, pottery and painting, remedial and enrichment, with a tremendous variety of opportunities for every one of the 1,000 students in the building.

Most of all, I wish you could visit in my own classroom where the 150 ninth graders for whom I was responsible are working with the other 150 of their classmates (300 in all), under the supervision of two English teachers and two social studies teachers, on research papers on the 1920s and 1930s. They're reading books, articles, newspapers; they're listening to tapes; they're interviewing their grandparents and recording those interviews for their classmates. They're learning to take notes; to use original resources; to outline; to write clear, concise papers. They range in ability from one youngster with an I.Q. of 75 to several with I.Q.'s above 140. The more able pupils are required to develop an hypothesis which they must substantiate — and I'd like to share just a few of this year's studies with you. Remember, these are fourteen-year-old ninth graders who are working on such topics of their own choice as:

"The prejudice of Americans toward foreigners in the 1920s contributed to the conviction of Sacco and Vanzetti."

"The KKK reflected the prejudices Americans felt toward minorities in the 1920s."

"The harsh peace treaty after World War I and the resulting depression in Germany contributed to the rise of Nazism."

The very slow youngsters are writing about the Dust Bowl — how it happened; could it happen again? Or about the Ku Klux Klan in the 1920s and 1930s — how could Americans let such an organization have so much influence over their lives? And they're looking at the laws we've developed since the Dust Bowl, and the Civil Rights legislation of the 50s and 60s. They're not memorizing dates or wars or the names of Presidents, but they're questioning and discussing and learning the importance of gathering facts, of having opinions on information.

Twenty-five years ago, while I was a student teacher getting ready to enter this great profession, we were told that our most important challenge was to teach the whole child so that he or she would become a useful member of society, a child who would question and wonder and learn, who would not accept the first information received but would challenge that information, who would learn to think and apply facts to new conclusions and new inventions.

I think we've done that very well. It often is a bit disconcerting to have former students come back to question the information they received in ninth grade, but it's exciting and indicative of the lifelong learning we want for all our children.

They are learning, thousands of them. Our challenge is to continue to improve our educational system so that all children have the equal opportunities we have all come to assume as the "right to learn."

Educating the Non-Degree Adult Student

Fred C. Snyder

No individual is born into the world in which he lives and no individual dies in the world in which he matures.
— Margaret Mead

Non-credit adult education programs are receiving increased attention as a means of helping individuals cope with problems of the day. The immediacy of the problems and the age group which can act or react to these problems indicate that assisting adults to secure solutions will provide the greatest benefits to society per dollar and effort invested. Time will not permit the luxury of developing new degree programs to meet these new or expanded needs; nor can we wait until the graduates of these degree programs attain positions where they have the responsibility and authority to act.

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Many of the problems of the individual and society are oriented to agriculture. Energy — environment — inflation — land use — are some of the problems in which agriculture has an important stake. We can become immediately involved in softening the negative impacts of these problems and work toward solutions through adult non-credit educational programs and activities.

Pennsylvania has a long and honorable history in the field of non-credit agricultural education. Benjamin Franklin founded the Junto in 1727 for the discussion of "natural philosophy" and politics. In 1744 the busy Mr. Franklin was the moving spirit in organizing the Society for the Promotion of Useful Knowledge, with the agricultural objective of discussing newly discovered plants, herbs, trees, roots, their virtues, and their uses; methods of propagating them; and new mechanical inventions for saving labor in the drainage of meadows. In 1769 this organization became The American Philosophical Society; it is the oldest learned society in America.

We Penn Staters are proud of the role played by Pennsylvanians in the development of adult education in

agriculture. Our own university, chartered in 1855, had an extremely broad view of the role of an institution of higher learning in helping non-degree students. In 1861 a "Practical Course" was established: "This is designed for such students as may wish to remain for a limited period of time, in order to see the various arts and operations of the Farm, Garden, and Nursery; and at the same time attend some of the classes in the College, and thus get a general idea of the subjects taught, without studying them with sufficient thoroughness to graduate."¹

An additional paragraph in the 1862 Catalogue described the instruction and the students as ". . .intended more particularly for such as may have become too old, or who are too delicate to take the entire course, but who wish to acquire special practical and general scientific knowledge, preparatory to going upon a farm."² This "Practical Course" is considered by some to have been the beginning of what were later called "short courses."

Expansion

At the present time we are in an era of expansion in adult education, an era in which every individual has the opportunity to learn, an era in which educational opportunities are being expanded by traditional institutions as well as governmental agencies and industry, an era in which traditional educational methodology procedures will be hammered into new forms and shapes to meet the needs of individuals and society, an era in which education seems to be in disfavor with society as a whole but is used wholeheartedly by the individual adult to meet his own needs.

Universities and colleges are becoming involved in adult education to a greater extent than ever before. In many cases this is the result of decreased enrollments in the degree programs. To maintain budget levels and meet expenses, some institutions have expanded their offerings to what is to them a potentially large new audience. This motive for establishing adult non-credit programs is not a solid foundation for developing quality programs. Furthermore, these programs may disappear in the late 1980's when a new bumper crop of adolescents is expected to provide increased attendance at institutions of higher learning and once again provide financial security for these institutions.

Post-secondary agricultural institutions have a long history of educational service. Their increased involvement in non-credit adult programs is based upon a philosophy of service, meeting the needs of individuals, groups, and the community; meeting the needs of industry and government. Agricultural institutions traditionally have taught non-credit programs to adults because they believe that higher education is an effective means of meeting needs. These beliefs provide the foundation required for top quality programs over a continuing period with the financial and moral support of the citizenry.

Your institution and you — as teachers, administrators, budget officers — cannot afford to stand by and

lose your position as educational leaders through default to industry or government agencies. You cannot afford the luxury of reaction when action is required. You cannot afford to lose the numerous benefits to you and your institution by neglecting adult educational activities.

As staff involved in non-credit activities you will learn much from your adult students. Characteristically, they are vocal in their praises and criticisms of the activities, instructors, facilities, and teaching methods. In some cases their observations are based upon experiences which may or may not be valid but which they share with enthusiasm. In other cases, the enrollees may have much professional formal training and many relevant high-level experiences to share with instructors and each other. They enroll in selected activities to meet certain goals and thus are highly motivated. The ability of many of these adults to adopt new practices or concepts immediately increases their motivation; their adoption of these practices provides much satisfaction to instructors! Adult students develop rapport with their instructors and in many cases continue a close personal relationship for years. They are willing to become involved in cooperative training programs. As instructors in adult programs, you will develop professional contacts and form personal friendships of value to you and your institution. These enlarge your concepts and contribute to your personal growth. Staff involvement in non-credit adult activities also should be recognized when salary increases and promotion in rank are considered.

Institutional Benefit

Your institution also benefits by conducting non-degree programs. In addition to the benefits it derives from a more valuable staff, many adult students provide cooperative training and internship opportunities for degree students. Employment of graduates of the institutions by these adult students is another of their important contributions. Some of the non-degree adult students contribute financial aid to students, programs, and research projects. Their assistance in recruiting outstanding high school students is another benefit the institution derives from adult programs. An adult student who participates in a successful activity is an ambassador of good will and contributes favorably to the institutional image.

The development of non-credit adult programs must be based upon the needs of the individual. Furthermore, until the individual recognizes that a need exists and that it is *his* need, his motivation will not be strong enough to cause him to enroll or to benefit from the instruction. A review of educational goals of individuals is relevant, for they provide criteria to evaluate the possibility of establishing a non-credit adult program, suggest the anticipated enrollment, and provide insight as to the probability of success.

Burgess, in an extensive study, identified seven major reasons for participation: the desire to know, the desire to reach a personal goal, the desire to reach a religious goal, the desire to reach a social goal, the desire to

escape from an unpleasant situation, the desire to take part in a social activity, and the desire to comply with a formal requirement.³

Adults may have one or more goals or reasons for participating in a particular non-credit program. An individual may enroll in a program to secure additional knowledge (desire to know) in order to prepare for a position of greater responsibility (desire to reach a personal goal). Also, this additional knowledge for subsequent assignment to a position of greater responsibility may be mandated by his employer (desire to comply with a formal requirement).

Usually one of the reasons for enrolling in a program is of major importance to the individual while other reasons are considered supplementary, or may even be unrecognized. As the program continues, however, some of the satisfactions the individual realizes may result in a shifting of the values assigned to reasons for enrolling.

In agriculture we have a tendency to concentrate upon technical knowledge and skills. The changing nature of our subject matter provides unlimited opportunity for technical programs. We have a tendency to disregard social goals, the desire to take part in a social activity, and the desire to escape from an unpleasant situation. These social goals are an important part of the "whole" individual and deserve consideration in the planning of non-credit adult education programs. May I suggest that the sociologist, psychologist, career counselor, demographer, anthropologist, and similar resource staff can make an important contribution towards educating the whole individual? The judicious use of "change-of-pace" time also contributes to social satisfactions — coffee breaks, banquets, barbecues, tours, even housing participants in close proximity to each other, all provide opportunities for growth through experiences other than technical. The degree to which an individual achieves these social goals (whether recognized or not), while meeting his major goal of acquiring technical knowledge, will greatly influence his personal evaluation of the activity.

The College of Agriculture at Penn State recognized as early as 1892 that a variety of activities was necessary to overcome obstacles which might prevent individuals from meeting their educational needs. Thus, in addition to non-credit short courses in agriculture on the campus of the University, the college instituted a series of correspondence courses in agriculture which permitted individuals to study at home. Originally consisting of five non-credit correspondence courses with an enrollment of 206, the 1977 program consists of 115 courses with an active enrollment of over 50,000 people. The correspondence program provides an instructional vehicle which transcends restrictions of distance — enrollees come from all 50 states and 20 foreign countries. Because the area of probable enrollments is so large, courses can be developed in areas where needs are less intense but just as vital to the individual. The numbers of prospective enrollees are based upon the population of the continental

United States rather than confined to residents of Pennsylvania.

Correspondence Courses Effective

The effectiveness of correspondence courses as an educational technique has been extensively researched. The great majority of studies indicate there are few significant differences in the quantity and quality of learning achieved through correspondence courses when compared to the traditional classroom method, programmed instruction, or television instruction.⁵ In an unpublished study conducted by the office of Correspondence Courses in Agriculture and Home Economics at Penn State, we concluded that the correspondence course technique was more effective than classroom instruction in preparing individuals for state mandated examinations on the selection and use of pesticides. What might be an even more important finding was that correspondence course instruction with an unproctored open book examination was an economically effective and efficient technique of instruction and evaluation. This provides greater flexibility in evaluating the progress of enrollees and giving a "final grade."

An important facet of correspondence courses is the audience they reach. Surveys we conducted indicate that many of the individuals enrolled in correspondence courses also participate in educational programs and activities of the Cooperative Extension Service and in other continuing education activities of institutions of higher learning. However, an equally large number of enrollees said that this was the only formal educational activity in which they participated and their only contact with Penn State.

Non-credit activities of Penn State University and its College of Agriculture began in 1861 with the establishment of the Practical Course. In 1870 an Annual Harvest Reception was established to assist farmers in solving their problems. The meetings were scheduled late in the spring and in 1882 became known as Farmers' Institutes. The institutes consisted of a series of about 30 lectures in a two-week period and were the vehicle for reporting research findings as well as providing time for discussion of problems identified by those attending.

In 1891 Winter Short Courses in Agriculture were provided to meet the needs of sons of farmers. They were 12 weeks in length and included laboratory, shop, and field practicums in addition to classroom instruction. It was obvious to the administration that this Winter Short Course program was not assisting those engaged in farming or related industry. Therefore, in 1892 a series of programs for adults were instituted in which the instruction was focused on a narrow subject matter area. Thus, a Creamery Course came into being as did various others in horticulture and agronomy. At present, the college conducts a total of eight short courses with an enrollment of approximately 626, and 90 conferences with an enrollment of 26,945.

Higher Plant Materials for Labs

J. A. Hawk and L. V. Crowder

Up to this point I have not commented about the Cooperative Extension Service of land-grant institutions. The success of the program, its mode of operation, and its value to its constituency are well known. The goals and objectives of the Cooperative Extension Service correlate closely with the goals and objectives of non-credit adult education programs sponsored or administered by other units of the university. The major differences found in their off-campus activities are:

1. Individual and small group instruction is provided by Extension, much of which may be on the farm or in the home.
2. Group extension activities are conducted locally with participants commuting from their homes.
3. Local extension programs rarely "import" recognized authorities.
4. No fees are charged or they are minimal.

In actual practice the non-credit adult education programs offered by the college on the main campus and the off-campus activities of cooperative extension supplement each other and provide a total program of non-credit adult education. In many cases, cooperative extension staff organize, conduct, and instruct in on-campus conferences and short courses and write correspondence courses. Both programs are essential for a land-grant institution to meet its objectives. No further discussion concerning cooperative extension service philosophy, policies, and procedures will be presented in order to save space and time.

Non-credit technician training programs of 32 weeks in length over a two-year period are also available from Penn State's College of Agriculture. Two majors are available: Ornamental Nursery Management and Turf-grass Management. The Winter Course programs are a cooperative effort with industry; the informal technical experience is provided by members of the industry. Winter Courses train middle management supervisors. The philosophy of the professional and the skills of the craftsmen are objectives of the program. Started in 1956, the program at one time consisted of four options: 1) Farm Equipment Service and Sales; 2) Pest Control Technicians; 3) Ornamental Nursery Management; and 4) Turf-grass Management. Over 1,287 graduates have successfully completed the programs; the average enrollment at present is 130.

References

- (1) 1861 Catalogue, Farmers High School, p. 17.
- (2) 1862 Catalogue, p. 56.
- (3) Burgess, Paul, "Reasons for Adult Participation in Group Educational Activities," *Adult Education*, 22, No. 1, 1971, pp. 3-29.
- (4) Hertling, James and Robert Greenberg, "Goal Expectations and Accomplishments of Adult Non-credit Course Enrollees," *NUEA Spectator*, Vol. XXXIX, No. 21, Sept. 1975, pp. 29-34.
- (5) MacKenzie, Ossian and Edward L. Christiansen, *The Changing World of Correspondence Study*, 1971, The Pennsylvania State University Press, Chapter V.

Plant science students are often reluctant to enroll in introductory genetics courses due to the molecular emphasis in lecture and widespread use of bacteria, fungi, **Drosophila**, yeast, and viruses in the laboratory. A plant genetics course with emphasis on the applied aspects of genetics was initiated at Cornell in the Spring of 1975.

A search was made for higher plant materials which could be used for laboratory instruction. Materials available were demonstration oriented and included ears of corn segregating for kernel characters, as well as segregating seedling populations of corn, soybean, sorgum, tomato, and tobacco. We wanted to provide students with an actual experience of designing and conducting an inheritance study with a higher plant and analyzing and communicating their results. This kind of project would be possible only if a short-generational higher plant could be found as a substitute for **Drosophila**.

Arabidopsis thaliana L. has been the most widely suggested higher plant for teaching genetics. Unfortunately, the small flowers and seeds make this plant unsuitable for student use. A desirable plant for use in introductory genetics laboratory exercises should meet the following requirements:

1. Short life cycle (2 generations/semester).
2. Easily cultured,
3. Moderate size flower, plant, and seeds,
4. Genetically variable,
5. Prolific seed production, and
6. Appropriate flower habit for controlled pollination.

Two plant introductions of **Brassica campestris L.** from India satisfied the above requirements. Plants with a 40 to 45 day life cycle were identified. Mutants were isolated and used by 60 students in the spring semester 1977. Students read and critically analyzed Mendel's paper which was then discussed by Teaching Assistants. The concepts and methodologies noted by Mendel served as guidelines for design of the student's own experiment. After making modifications suggested by Teaching Assistants, each student used the proposal to conduct inheritance studies with two mutants. Students were able successfully to complete their project, analyze data, and write a research report in the format of a scientific journal within a 15 week semester.

It is our opinion that **Brassica campestris** has the potential for teaching genetic principles. Several genetic concepts were encompassed by the mutants used by the class, and student response was very favorable.

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