

## ON-FARM EXPERIMENTATION IS A TEACHING METHOD

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An on-farm research project as an integral part of a course for adults is perhaps the most effective teaching method to use with young and adult farmers. However, its importance is all too frequently overlooked in teacher education courses. A review of major texts used in agricultural education courses revealed only a passing reference to this teaching technique (Krebs, 1967, Drawbaugh and Hull, 1971, Stevens, 1967.) Other agricultural education texts referred to it not at all (Morgan, et. al. 1960, Bender, et. al. 1972.) Yet, research has clearly demonstrated the success of this approach (Williams, 1963, Zieber, 1966.) Teachers and potential teachers need to know how to effectively use this teaching tool. Responsible teacher educators must include instruction in its use in both undergraduate and in-service education courses. At Penn State a senior research problem during student teaching is used to implement this concept.

### How It Works

With the young or adult farmer advisory committee, a course topic is selected. It then becomes the teacher's responsibility to organize the course. The teacher organizes an on-farm research project based on the selected course topic. He may enlist the expertise of university or industry specialists in developing the design of the project. The project design is reviewed with the farmer advisory committee. With potential class members the research project is started, and data is collected. The collected data is summarized and used in the course to supplement the instructional material. The involvement of the teacher, farmer, and industry gives the subject matter a local flavor and puts it on a practical base. Farmer interest is enhanced because the course deals specifically with their farming situations. Special situations uncovered during the research phase are subjects for intensive on-farm individual instruction. Thus, the research-class combination provides a framework for continuing individual instruction as a follow up of the formal coursework.

### What We Did

Persuaded of the effectiveness of this instructional concept, the authors implemented it in an in-service course for agriculture teachers of adult farmers. Fourteen teachers of agriculture enrolled. It should be pointed out that this group of teachers of adults had been meeting independently on a semi-annual basis for several years to

share ideas. Six class sessions were organized with these teachers. Three were scheduled for early Spring 1972, one in September and one in December of 1972; the final class was held in March of 1973 at which time the teachers registered for the course. The course outline appears below. The rather different scheduling pattern was arranged to allow teachers to implement the instructional theory advocated in class. Each teacher in the class became involved in one or more research projects over the time span of the course. Most of these teachers used the research data in teaching an adult farmer course during January and February of 1973.

#### Course Outline

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| Early Spring, 1972 | 1. Introduction of Research as a Teaching Method.  |
|                    | 2. Identification of Current Problems.             |
|                    | 3. Designing the Research Projects.                |
| September, 1972    | 4. Progress Reports.                               |
| December, 1972     | 5. Summary and Analysis of Data Plans for Courses. |
| March, 1973        | 6. Reporting Results.                              |

A more detailed explanation of the course outline is in order. At the first class session in March of 1972, the research method of teaching was explained. Basically the technique involves (1) identify a current problem, (2) design a research project and plan the procedure, (3) involve the young and adult farmer class--conduct the research on their farms, (4) teach a course incorporating the research results with the subject matter of the course, (5) follow up with individual on-farm instruction using problems identified by the research project. The research of Williams and Zieber was cited to document the effectiveness of this technique.

At the second class session, teachers were asked to identify current problems. Recent literature was made available as a resource. During this second class session, the teachers resolved to work in the following areas: (1) feeding methionine hydroxy analog to dairy cows, (2) death losses in growing dairy herd replacements, (3) alfalfa production evaluation, and (4) dairy cattle sire selection. Once these problem areas were identified, the teachers formed committees to work on them. Teachers attempted to become knowledgeable about the area they selected. Research literature was circulated prior to the third class meeting. University specialists were contacted, and these contacts became increasingly important as the projects developed.

The third class, held in April of 1972, was used for designing the projects and outlining the procedure for conducting the experiments. The committees organized during the previous class functioned to design and implement their projects. Committees remained intact throughout the remainder of the course and were responsible for conducting the experiments and designing the courses to be taught. At this class session data collection forms were developed, and decisions were made relative to samples, controls, and time. A chemical company and a feed company agreed to support the methionine hydroxy analog field trial.

Because of statewide interest, the methionine hydroxy analog experiment and the alfalfa research program were explained by the committees in charge to state teachers' convention in July. In addition, at the teachers' request the Animal Science Department of the College of Agriculture offered a special problems course on forage analysis in August. Teachers brought in alfalfa hay samples from the research project and analyzed them as part of the class work. These activities evolved between the third and fourth class session.

In September the fourth class was held. How far have we come and what still needs to be done was the theme. Each teacher committee reported on the progress of its project and discussed problems with the group. Additional resource material was brought into this class--both by the instructors and the teachers. A major problem developed at this session that plagued the instructors through this and the fifth session. The teachers became so interested and involved in the research that they began to think of it in terms of the importance of the research rather than as an integral part of an educational package. It was not until the final class session in March 1973, that this problem was finally resolved.

Just before Christmas, the class met for the fifth time. The committees worked to summarize their research data and to organize the adult courses to be taught in January and February. The experiments, though not complete, were far enough along to permit preliminary analysis. The greatest difficulty was to get teachers to turn from the research to planning the adult courses where the research data were to be assimilated.

The final class was held in March 1973. Since the December class, the teachers had taught courses to their young and adult farmers. Each teacher reported on his experience. The results were contagious--teachers were enthusiastic--they had tried a new teaching method and it had worked. In fact, they reported that it had worked better than any approach previously used with adults. Follow up on farm instruction was continuing and teachers were already "swapping" ideas for this year.

## Summary

The enthusiasm generated by their successful experiences has continued beyond the course. Two of the projects, dairy sire selection and calf growing, were reported at the annual summer teachers' conference this July. At the teachers' request, the Dairy Science Department offered a special problems course on calf raising in August, which was attended by 16 of the teachers.

The experimental project teaching concept learned by these teachers of adult farmers opened new avenues for improved instruction. New projects are in the making. These teachers are operating at the highest level of instruction. Their motivation is high. The element of discovery keeps it high. By combining carefully organized local research with available instructional materials, experienced teachers are writing their own instructional units for adult courses. As a result, courses are taught by teachers who have become experts in the subject matter; local farm data adds authenticity; the material is up to date; and farmer (student) motivation is high. The involvement of teachers with farmers in planning, organizing, and teaching an adult course results in superior instruction.

Teacher educators need to emphasize this method so that teachers and potential teachers become competent in its use.

## END NOTES

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