

A student handbook was developed which included an outline for each lecture topic as well as the objectives developed by the respective professors. Each student was required to develop a research paper on a low energy agricultural area in which he was interested.

At the conclusion of the term, participating students evaluated the course using the stated course objectives as the criteria. Students were given the opportunity to express both positive and negative comments as well as offer suggestions for course improvement. Student ratings were high with an average of 4.0 on a scale in which one was very poor and six was excellent. This indicated student satisfaction and success in reaching the course objectives as well as the success of the team teaching approach.

From the evaluations, appropriate changes have been made to assure students an updated exploration of the increasing need for energy awareness in Florida's agriculture.

The course will be offered again during the spring semester 1983.

Summary

In conclusion, the University of Florida's Institute of Food and Agricultural Sciences has made a commitment to explore new energy ideas for Florida's agriculture in the 1980's. Likewise, the Department of Agricultural and Extension Education is dedicated to supporting that commitment with low energy technology inservice education programs, instructional materials development, and an interdisciplinary course.

The three thrust approach, developed by the Department of Agricultural and Extension Education at the University of Florida, has modeling potential for similar dissemination projects in other states. This approach has been successful in disseminating new low energy ideas to vast numbers of agricultural professionals while retaining a high degree of useful and complete information.

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Teaching Research Extension

Exploitation of Complementary

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In many Land-Grant institutions, the question of the efficacy of split appointments (Teaching, Research, and Extension) gives rise to heated debate. Oftentimes, it is stated that County Agents prefer that Extension Specialists remain 100 percent Extension and specifically avoid the classroom — presumably because classroom teaching reduces the flexibility of the specialist in responding to the needs of traditional Extension clientele (individual farmers and farm groups).

Although no formal survey of attitudes was attempted for this paper, our experience is that the true major stumbling block of three-way split appointments is the inflexibility of individual professionals (whether they are Extension-oriented or Teaching-Research-oriented). Further, there are administrative problems which arise between the Experiment Stations and Cooperative Extension Services in trying to maintain balance of time and budgets between the differing functions, roles, and programs. However, we believe that there are many compelling complementarities among teaching, research, and Extension that can be exploited through systematic use of three-way split appointments.

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Integrating Teaching and Research

In the March 1982 issue of the *NACTA Journal*, Ronald A. Brown succinctly argued that there is and should be great complementarity between research and teaching functions for teachers of agriculture. The major thrust of his argument is essentially that teaching and research ultimately have the same goal — learning — but that each activity takes a different path and is at least initially aimed in different directions to reach the same end.

Without providing the detailed support given by Brown, his eight major ideas concerning the integration of teaching and research are:

1. Research results provide first-hand instructional material
2. Research is a part of our professional responsibility
3. Research and teaching are mutually supportive
4. Research enhances professional development
5. Research allows for graduate student training
6. Research improves the professional image of faculty members
7. Research is a source of material for publications
8. The integration of teaching and research is compatible with principles of learning

As teachers, researchers, and Extension specialists, we would not argue with any one of these ideas or the set — each is well described and essential to both good teaching and good research. Our only argument would be that the inclusion of Extension in each of the eight points could mutually benefit the residential instruction, research, and Extension functions of the Land-Grant institutions.

Goals of the Institution

All too often, Land-Grant institutions have a stated goal of enhancing the agricultural sector of their respective states, without having a consistent and coherent set of objectives and procedures to reach that goal. If that goal is accepted, it seems necessary to promote an integrated approach to training and educating the future leaders of the state; solving the constraining technical, economic, and social problems of the general agricultural economy of the state; and providing assistance to and educating the current members of the agricultural economy of the state. More succinctly, there is a need to promote an integrated approach to teaching, research, and Extension. Each function, separate only because of thrust or emphasis, actually should have the same goal: enhancing the agricultural sector through education.

In certain situations, the goals of the institution may be best served by having faculty positions directed fully to one of the three major functions. However, in other situations, the inclusion of three-way split ap-

pointments could mutually enhance each of the three functions by providing a broader exposure of each faculty member to problems faced in the state.

Integration of Extension

The arguments listed by Brown for the integration of teaching and research could be rewritten to include Extension. The first eight arguments listed below are paraphrased from Brown.

1. Extension provides first-hand instructional material. Exposure to real-life current problems faced by the farmers and ranchers of the state can enhance the credibility of the researcher and teacher by creating an awareness of real concerns.
2. Extension (in a broader sense, service to the community) is a part of our professional responsibility. As members of an agricultural faculty, we have a responsibility unique within the university to reach out to and serve the needs of the people of the state.
3. Extension, research, and teaching are mutually supportive in that each can provide ideas for the other two. The communication and problem-solving skills developed through Extension and teaching are complementary; and furthermore, Extension applications can make research emphasis more practical.
4. Extension enhances the professional development of faculty and provides a source of renewal and contact with the world beyond the halls of the university. This enhancement can reach into the classroom and the laboratories and enrich faculty, resident students, and off-campus clientele.
5. Extension may not directly affect graduate student training in the traditional patterns of graduate education. However, as Cooper reported, new Ph.D.'s are generally trained for research and have had little exposure to or training for teaching. White discussed a new idea to adopt a teaching practicum to alleviate partially that lack of exposure. Similarly, Extension Services face the same problem of finding specialists for Extension work based on research abilities of new Ph.D.'s. Furthermore, if the student's graduate advisor held an Extension appointment as well as teaching and research appointments, the advisor's capability to expose his student to all phases of professional responsibility would be enhanced.
6. Extension improves the professional image of faculty members, especially with students on and off campus. As argued earlier, Extension can enhance the stature of the teacher in the eyes of resident students; and further, teaching can enhance the stature of the Extension

specialist in the eyes of the off-campus "students."

7. Extension, as well as research, is a source of material for publications. The integration of teaching, research, and Extension functions can enable the professional to address different audiences as well as different problems through the use of professional journals, research reports, and bulletins, Extension circulars and newsletters, the farm press, the popular press, radio and television, and video mediums. Not only do the various styles, outlets, and audiences enhance the growth and breadth of the professional, but also they can broaden the exposure of important material and help educate wide-ranging audiences.
8. As argued above, the integration of teaching, research, and Extension is compatible with principles of learning and compatible with and **necessary** to successful completion of the goals a College of Agriculture should be striving to achieve.

These eight ideas may be sufficient to indicate the need to better integrate teaching, research, and Extension. However, in light of declining enrollments in agricultural colleges during the 1980's, the true integration of the three functions may be necessary to maintain student enrollments. Consequently, we offer a ninth idea to be considered:

9. An integrated Extension Service can be one of the most effective recruiters for a Land-Grant institution. Not only can the County Agents and area specialists be the dominant front-line recruiters, but state Extension Specialists can also be more effective student recruiters if they are also active in the classroom. The additional off-campus exposure to prospective students (as well as to previous graduates and parents) can provide unique opportunities to enhance feelings of good will between the campus and the state it is meant to serve.

Summary and Conclusions

The integration of teaching, research, and Extension can and should promote the common goal of Colleges of Agriculture among Land-Grant universities: enhancing the agricultural sector of the state through education. Not only are all three functions necessary to meet this goal, but each is complementary to the others, i.e. each function aids the successful performance of the others. The inclusion of Extension is essential in that Extension activities can help the professional to direct research toward real problems faced in the state and to direct teaching to the practical problems students perceive and hope to find answers to when they enroll.

It has been our experience that an integrated approach to all three functions increases productivity in each function. There is no doubt that an integrated approach requires effective and farsighted leadership within the administrative ranks of the institutions. Department heads, program leaders, deans, and directors must be committed to providing the best overall service possible to all segments of the state's agricultural clientele without the traditional concern for the "territorial rights" of each administrative program. Furthermore, each administrator must understand the needs and complementary roles of the three programmatic functions and be willing to allocate the total package of professional and financial resources to maximize the benefits of the complementarity. Even when the administrative problems are understood and properly managed, the success of three-way split appointments will ultimately depend upon the sincerity and dedication of the professional. There is no doubt that split appointments can cause major time management problems for the professional, but individual initiative can overcome all of the problems and lead to a more effective teacher, researcher, and extension specialist.

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