must last at least six weeks. They may be paid or unpaid, but must be taken for credit. Pennsylvania teacher certification standards require that each student submit evidence of occupational competency within the field. This occupational competency provision can be satisfied with one summer of supervised internship experience.

Student Organizations

Students in need of leadership skills are encouraged to get involved in one of the three student organizations operating within the department. Students are encouraged to become members of the Collegiate Chapter of the Future Farmers of America, the Eta Chapter of Alpha Tau Alpha—the professional agricultural education fraternity, or the World Agriculture Service Society. All three organizations provide workshops, leadership opportunities and professional enrichment activities designed to be congruent with students' occupational goals.

Advising

In addition, students are advised to select courses which will add technical breadth and depth to their undergraduate program of agricultural education. Faculty advisors have responsibility for monitoring students' progress as they move through their professional preparation programs.

Summary

This article is not about just making recommendations to remediate student deficiencies in technical agriculture and leadership skill areas. A more accurate description would be a comprehensive system for monitoring a student's entire program so as to dovetail past experiences with proposed education. Through self assessment and the careful use of a faculty interview process, the experiential base of each student entering the department is carefully assessed. Students deficient in technical agriculture and leadership skills are remediated through a variety of approaches that include but are not limited to credit courses, student organizations, and advising.

The experiential assessment model is entering its third year of use. Preliminary indications are that the tedious task of assessing student skills, monitoring skill development, and making recommendations for additional skill development is paying enormous dividends.

Students are becoming more confident in their ability to perform and are entering the classroom with greater credibility and self esteem. In the classroom they are able to relate, discuss, demonstrate, and impart technical agriculture knowledge and skills that were previously foreign or unfamiliar to them. In addition, cooperating teachers (secondary teachers who supervise student teachers) report a much higher degree of satisfaction with student teacher performance.

Overall, the experiential assessment model is helping to produce teachers who perform at a higher level in the schools. But more importantly, the process is developing teachers who feel more confident about what they do, are more satisfied with their jobs, and ultimately make a significant difference in the learning of students studying vocational agriculture.

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Experiential Learning Models For Training Programs

H. Gene Peuse

Experience-based training programs begin with the premise that participant experience should be the main genesis for learning. Accordingly, the design and execution of training should allow for maximum participant activity as the central stimulant for learning. All three models reviewed here incorporate a learner-centered approach to transferring agricultural knowledge and skills. First, they draw upon a common set of learning activities which simulate life work experiences. Types of simulated experiences include, for example, role plays, field trips, games, modeling exercises, demonstrations, critical incident reviews, work simulation tasks, case studies, and scenario projections. Second, the common aims of these models are to enhance knowledge and skills in agricultural subject matter and also to impart an ability to learn from experience. Not only should learners become more expert technical agriculturalists, but they should develop into more self-aware, self-reliant users and analyzers of experience.

These pedagogical typologies differ, however, in the extent to which participant input is given a place in the learning process. The area of prescribed teacher or trainer influence in the process consequently differs as well.

In preparing and implementing an experience-based agricultural training program, the course leader must resolve a number of basic questions such as: How much structure should be established for the training

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program? How should the group get started and involved in the learning process? When and how should the course leader provide subject matter expertise during the learning process? The objective of this paper is to compare and contrast how three experiential training models address these issues.

The Kolb Model

Kolb (1984) has developed a sequence of four learning stages through which, he contends, participants must pass and which must be deliberately designed into an experiential program. Figure 1 shows that Kolb places concrete experience as the launching point of the learning process. A concrete experience is a here-and-now, personal engagement which stimulates thoughts, feelings and actions. In daily human interaction with the world, a concrete encounter may be a very conscious, goal-focused activity or may be a more passive living through a happening. An experiential engagement may occur in nonschool settings — such as in a farmer's wheat field, a veterinarian's clinic, or a firm's sales office — or in formal learning situations such as a classroom or school workshop. In the latter case, natural setting experiences should be simulated as much as possible.

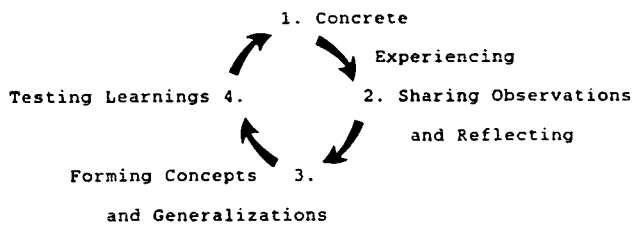

Figure 1: Kolb's Experiential Learning Cycle

When a concrete experience is witnessed or shared by all individuals in a group, that experience becomes an event common to all and immediately available for description, reaction and analysis by the group. After experiencing a common learning activity, participants can enter Stage 2 of the learning cycle during which attention is given to describing what just occurred. Group discussion focuses on recalling actions taken (or not taken) and reflecting on individual or group performance.

Stage 3, generalization, entails the search for concepts, principles and lessons derived from the experience. Summary statements are made about what participants need to know and do if engaged in a similar concrete experience again. The group begins to project beyond the recently-experienced particular event and establishes learnings to be applied in similar, future situations. In the final phase, participants test their newly acquired knowledge and practice skills under guided, experimental conditions. This stage permits confirmation or modification of previous learnings and essentially becomes another concrete encounter that leads, in turn, to a second round of the experiential learning cycle.

The experiencing phase is dominated by participant's physical and mental activity, with the trainer monitoring performance and intervening only to clarify the broad purposes of the session. The trainer then signals the end of the experiencing stage and solicits statements from participants about what happened. Through questioning, the trainer probes for participant's observations and personal reactions to the event. Data are gathered from the learners about what they saw, heard, did and felt during the activity. Occasionally the course leader, if failing to stimulate recall through questioning, may submit his or her own observations about what occurred during the experience. Still, the cardinal operating principle is to provide full opportunity for expression of participant's perspectives and recollections without being dominated by views of a knowledge authority. Likewise, during the generalization phase, the trainer directs the dialogue through inquiry rather than proposition and draws attention to patterns in participant-generated data which might lead to the development of principles and theory grounded in participant's, rather than instructor's, experience. Again, the trainer may introduce concepts and theory but this must be carefully linked to generalizations generated by the participants themselves.

The strengths of the Kolb model are its conceptual simplicity and its emphasis on immediate, shared concrete experience as the initial point for actively involving learners. This model establishes, from the start of training, the primacy of participant experience as the basis for critical reflection. Because of its simplicity and abstractness, however, Kolb's model easily can be misapplied and misinterpretted. For example, course leaders wrongly can conceive of a question and answer session as being a concrete experience whereas in reality the group may be in the reflective observation or generalization stages (Sugarman, 1985). Likewise, one may conceive of the cycle's length extending over a period of an hour or several days (Kindervatter, 1977), or as a series of cycles recurring throughout an academic year (Christopher, 1987). The risk of using Kolb's model as an instructional guide, with the duration of any stage prolonged over several days, is that many concrete experiences naturally arise within that period, thus resulting in a confusing array of data during the learning period. Normally it is best to apply the experiential learning cycle over a two to eight hour training module.

The Steinaker-Bell Model

Steinaker and Bell (1979) envision the learning process as passing through five basic stages as displayed in Figure 2. These sequential steps are intrinsically linked, as are Kolb's phases, but rely heavily from the outset on the trainer energizing and motivating learners to participate in an experience. During the exposure phase, the course leader clearly dominates the scene, using audio or visual materials, reciting stories, asking

questions, and performing other activities to arouse interest. Participation, the second stage, is only roughly equivalent to Kolb's experiencing, and the trainer is expected to provide supportive feedback during the learning activity, to intervene when obstacles are encountered, and to reveal participant learning that should result from successful completion of the exercise.

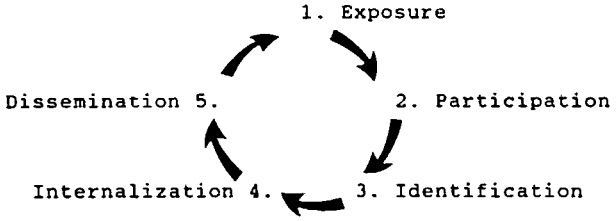

Figure 2: Steinaker-Bell's Experiential Taxonomy

This trainer-directed exploration leads to an emotional attachment and intellectual absorption on the part of the learners in the experience, known as identification, during which they become cognizant of new knowledge and skills being acquired. Subsequently they seek more study resources and experiemtnal opportunities and become more self-directed. The setting now shifts from classroom and school laboratory to field activities, and there is greater interaction among group members as they increasingly learn from each other. Behind this evolution from identification to internalization, the trainer moderates and sustains participant engagement, arranges assignments that have less obvious solutions, and interrogates participants about new learnings and generalizations being formed by the experience.

The final transitional state, dissemination, is reached when participants, after having internalized new behaviors, attempt to help others develop similar habits. At this point, learners manifest their conviction about the value of their new skills and knowledge through voluntary testimony and creative applications in other situations. The trainer now reasserts himself or herself as a constructive critic, approving of participants' enthusiasm and engaging them anew by challenging style, critiquing performance and products, and drawing them into more difficult situations.

Steinaker and Bell prescribe a high degree of trainer influence for initiating the learning process with decreasing presence through internalization. After participants become models and advocates of the modified behaviors induced by the process, the trainer again becomes dominant by exposing them to new experiences. Thus the trainer assumes different roles through the five positions in the experiential taxonomy — from motivator to catalyst, moderator, sustainer, and critiquor. Whereas Kolb's model implies a rather consistent, neutral facilitative function for the course leader, Steinaker-Bell's taxonomy explicitly requires shifting from a highly directive relationship with learners at the beginning of training to a temporary, somewhat removed relationship as participants become more proactive and immersed in the experience.

The five basic categories of the experiential taxonomy consist of additional subcategories, not shown in Figure 2, which detail more discrete trainer-participant and participant-experiential interactions. in contrast to Kolb's experiential learning cycle which almost exclusively emphasizes the participant-experiential relationship, Steinaker-Bell's experiential taxonomy accords the trainer a prominant place in the learning process and requires active intervention when participant errors occur or are about to occur in practice or in thought.

The Krebs Model

Krebs' model (Crunkilton and Krebs, 1982; Krebs, 1967) relies on a problem-solving approach to mastering agricultural skills and knowledge. It is based on the premise that learning is motivated by a compelling problem encountered in experience, and that when participants and trainer recognize the problem, the learning process can be directed through the steps outlined in Figure 3. The model presumes that the participants have been engaged in a relatively common set of agricultural activities.

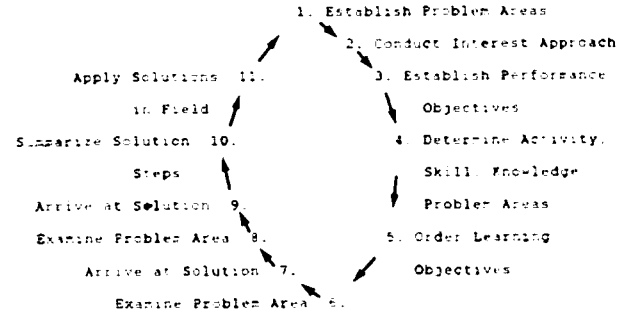

Figure 3: Krebs' Problem-Solving Approach

A pre-training analysis of agricultural enterprises and expressed participant performance difficulties allows the trainer to anticipate appropriate topics for the course (Step 1). Data from this survey are presented to the group, and participants are given an opportunity to expand or modify the trainer's description of the existing situation (Step 2). The group then is guided through a discussion about what the improved situation might be (e.g., optimum production targets for an enterprise), what particular production practices are problematic (e.g., storing wheat), and what skills and knowledge areas ought to be explored during the training program (Steps 3 and 4). In the subsequent phase, the group reaches consensus concerning the order in which problem activity areas should be studied. At this point participants have a clear idea of what the learning objectives of the course are.

Examination of each problem area (Steps 6 and 8) may include classroom discussion, supervised study of relevant literature, presentations by experts, field visits and other activites. After each problem area is

examined, participants record prescribed procedures needed to perform each specific enterprise activity (Steps 7 and 9). After examining all problem areas, participants are led through a chronological review of approved practices and procedures for the enterprise under study (Step 10). The venue for training then shifts to the workshop, field, or livestock center where learners refer to their notebooks as they apply prescribed practices (Step 11).

Krebs' model places great reliance on the trainer's familiarity with participants' backgrounds and pre-training experiences, meaning that personal contact, situational analysis, and training needs assessment are vital prerequisites. This is a particular strength of the model. Nonetheless, the subsequent prolonged attention to cognitive recall of past experience and cognitive rehearsal of anticipated experience (Steps 6-11) before reaching actual application (Step 11) implies the notion that participants should know before doing. In Kolb's terms, the problem-solving approach of Krebs' dwells on reflective observation and generalization with experience and experimentation as distant precedent and consequent acts. Thus Krebs' framework leads to greater trainer-participant interaction than that of Kolb, but alternatively less trainer input into the content and direction of the course than that of Steinaker-Bell.

Integrating Positive Features of the Models

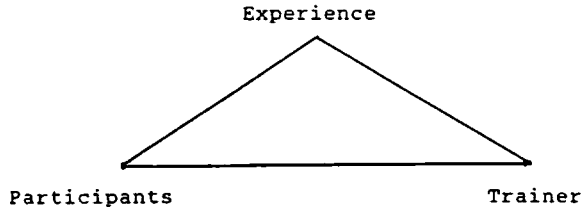

Figure 4: Experiential Triangle

The three models tend to emphasize different sides of the experiential triangle. Kolb stresses the participant-experiential axis, with the instructor being deliberately permissive and the learner motivated by immediate experience. Kolb credits his thinking to the work of Kurt Lewin, who was a central figure in the creation of the National Training Laboratories and whose theories are interwoven throughout much of the organizational development and group dynamics literature today (French, Bell & Zawacki, 1983). A strict reading of the model would lead one to see it as a free-wheeling participant's plunge into activity with the trainer assuming a muted background role. In practice, however, trainers play an active regulatory part in the learning process and attend to what is called "climate setting," which mirrors the exposure phase and interest approach of the other models. Some practitioners even take the position that presentation of academic theory and behavioral models prior to experiencing does not violate the experiential learning cycle (McCaffery, 1986).

At the other end of the spectrum, Steinaker and Bell grant the instructor a protagonistic function, prodding learners' latent readiness and carefully manipulating the curriculum so that knowledge, skills and attitudes are engaged toward reaching the trainer's predetermined objectives. The participant-trainer axis is constantly in focus. The creators of the experiential taxonomy note its relationship to the work of Bloom, et al. (1964), Krathwohl et el. (1968), and Simpson (1966), and attest that these taxonomies were formed into one after research and testing in the Ontario-Montclair School District in California. Their schema is the most intricate and behaviorally detailed of the three models and, unlike Kolb's model, can be more appropriatey applied as a conceptual guide for, say, three month's of study.

Krebs, an agricultural educator, developed a framework reflecting strategies used by master vocational agricultural teachers in high schools. The accent on pre-training diagnosis of participants' work situations arises from the traditional close relationship between school curricula and rural community activities. Effective teachers, notes Krebs, have intimate knowledge of local agricultural conditions and get close to the real world experience of those to be trained. Before simulated training experiencs can be fashioned, the course leader must have a firm grasp of the problems encountered in on-the-job situations. Although practitioners of the other models may employ observation, interviews, surveys, etc. to determine foci for training, Krebs' incorporation of situational and needs assessment into his theoretical model ensures that the training program will be aligned with participant experience. This strong trainer-experience connection ought to translate into more relevant simulated learning exercises for the participants.

Collectively, these pedagogical designs illustrate many of the basic elements of excellent teaching and training as summarized by George (1987). An experiential training program is planned around learner needs and objectives, these objectives confirmed by the participants at the start of training, and learning activities made as concrete as possible. Participants are challenged to re-enact work behaviors, examine their performance, and try new skills. Interest is maintained by getting at intellectual content through learner participation and trainer modeling, rather than through passive listening to generalizations drawn solely from the trainer's experiences.

Experiential trainers, nevertheless, actively manage the learning process by setting up carefully designed simulated experiences, applying questioning techniques, allowing participants time to reflect on their experiences, monitoring study and rehearsal, and providing feedback and insights on performance when participants fail to comprehend subject matter or to master skills. Expert trainers avoid center stage so that

participants can focus attention on what they are thinking and doing; but at the same time trainers do not relinguish their responsibility for keeping participants on task, directing transitions from one experience to the next, and adroitly handling exchanges of different perceptions and understandings — including the trainer's own.

Summary

All three experiential models employ many of the same types of learning exercises and require trainers to use these activities to help participants evaluate their experiences. Kolb's experiential learning cycle begins with a learning activity, followed by an examination of that experience and then application of learnings. Krebs' problem-solving approach prescribes first an assessment of real world experience and then guided practice using learnings developed from recall and research related to that experience. Steinaker-Bell's experiential taxonomy involves a series of assignments through which participants progressively become more practiced at behaviors the trainer has determined should be learned.

Krebs' model and a variant of Kolb's model have appeared in an international reference manual on agricultural extension and education (Swanson, 1984), and increasing numbers of college teachers of agriculture are becoming familiar with these experiential approaches. As these models are more widely applied, it will be interesting to watch for refinements that teachers and trainers of agriculture introduce and for changes that result in the design and delivery of agricultural training programs.

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Agricultural Teacher Education Programs in China

Chi Zhang and Barbara A. Holt

One of the results of educational reform in China since 1978 has been the rapid development of vocational education. "By the end of 1986, there were 3,187 vocational and agricultural middle schools with 2.5 million students" (Bott, 1988, p. 26). According to **People's Daily** (1987), there were also 3,782 secondary specialized schools with 1,757 students in the same year. The ambitious goal of the government is to produce 1.1 times more graduates from secondary vocational technical schools during the current five years (1986-1990) than the previous ones (the Seventh Five Plan for National Economy and Social Development of the People's Republic of China). In rural areas many secondary schools either have started to offer vocational courses or have been transformed into secondary agricultural-technical schools. These new programs demand a great number of agricultural teachers. However, at present there is an acute shortage of teachers for agricultural education, which was pointed out by research (Zhao, 1984) as well as the Decision on Reform of Educational System of the Central Committee of Communist Party of China (1985). In order to meet this demand, many agricultural teacher education programs have been established in higher education since the early 1980s.

To some extent most agricultural universities or colleges now provide agricultural teacher education programs. Agricultural teacher education programs in China have some unique characteristics as well as the most common features of the conventional teacher education programs. They are very diverse, but they are all below the college degree level at this trial stage. To understand them it is necessary to examine their philosophy, curriculum design, and the performance of graduates. The following is a brief discussion on some aspects of their programs.

Program Rationale

Agricultural teacher education programs in China started in the early and middle 80s in response to the great demand for secondary agricultural teachers. All of them are administered through agricultural universities or colleges, where little was prepared for them at the beginning. It is assumed that agricultural

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