

Second is identification of natural resources that exist and are readily available. Regardless of the resources, whether they be water, soil, trees, people, animals, grass, rocks, bamboo, or a combination of several resources, project goals should be aimed at using these reserves instead of relying on imported resources foreign to the populace. Such natural resources are already an integral part of the culture, are accepted by the populace, and will be available long after the projects funded by donor nations have been phased down. Dependence upon non-manufactured or manufactured resources from outside the culture can seriously stifle or suppress the intended long term effectiveness of a project.

The third function is to introduce modern agricultural concepts by using intrinsic talents and skills already in place and readily available natural resources. Such concepts should address the felt needs expressed by a nation's populace.

Here is where the agricultural technicians, specialists, and educators from donor nations might fit into a scenario. They should be more capable of transferring modern technology and concepts to people in a way that would reflect relevancy to their expressed

needs. The probability of having an impact should be greater when local skills, talents, and natural resources are manipulated into development project goals of donor nations.

When a change occurs within a society, varying degrees of resistance can be expected. However, if the goals and objectives of a funded project are to be achieved effectively within a reasonable time and with minimal cost, every attempt to keep the anticipated resistance to a minimum should benefit both recipients and donors. Using the talents, skills, and natural resources characteristic of the culture to meet project goals may cause new concepts to be more readily accepted by the people.

Education cannot be forced on people; they must have a felt need and look with trust and approval upon those who attempt to give it expression. It must address expressed needs and blend into cultural mores. Thus, it's crucial that modern concepts not compete with or replace traditional practices in a culture, but should be added to the culture for consideration, acceptance, and ultimate implementation by those having the expressed need.

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## Practical Work: A Major Curriculum Emphasis In New Zealand Colleges of Agriculture

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Abstract

*Lincoln College, a university college of agriculture in New Zealand, is similar in many ways to U.S. land-grant colleges of agriculture. However, it differs from its U.S. equivalents in its emphasis on practical work in its courses. Field trips involving half-day and full-day visits to farms and other enterprises are a regular feature of most courses. Many classes also participate in one-week field tours to sites from one end of the country to the other. There is also a strong emphasis on work experience. One course demands 22 months of farm experience of the students before they are allowed to start the course. Other courses require students to accumulate up to 72 weeks of work experience during their courses. The practical emphasis extends to assessment as well, in that many senior students are required to complete a practical field test lasting one week as their final evaluation in farm management. Faculty members also have a strongly practical orientation. Some are farmers who are employed as part-time tutors while other full-time lecturers are involved in supervision of the College farms. This strong emphasis on practical work is typical of*

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*agricultural education in New Zealand.*

### Introduction

In the education of a professional it is necessary to strike a balance between theory and practice. While graduates must be well versed in the techniques of professional practice, their education must also include a thorough grounding in the theory which underpins practice. Nowhere is this more true than in the professional education of agriculturalists, where debate on the appropriate balance between theory and practice has a long history (Cheit, 1972). Judged from the pages of **NACTA Journal**, it would appear that theory receives greater attention in most college agricultural courses than practice. Over the last ten years, this **Journal** has published relatively few papers dealing with out-of-classroom practical work, and the impression given to the reader is that most college education in agriculture emphasizes classroom instruction in theory at the expense of practice. There have been, of course, exceptions. For example, several papers report on various strategies for helping students to develop basic farm skills (e.g. Vorst, 1979; Mayer, 1980; Mortenson, 1981; Seals and Armstrong, 1983). However, these often describe short-term elective programs aimed at coping with the increasing number of students from non-farm backgrounds. The other area which has received intermittent attention in these pages is that of cooperative programs or internships

(e.g. Evans, 1977; Cessna, 1977; La Prad, 1977; Fog, 1980). These programs typically involve students in working alongside professionals in the agricultural industry. Such programs are said to be valuable because they allow career exploration, help students to relate classroom learning to the 'real world' and help students to obtain jobs after graduation. However, as we understand it, relatively few agricultural undergraduates experience even these limited forms of practical work.

While practical work might perhaps be neglected in many U.S. colleges of agriculture, this is not the case in other parts of the world. In New Zealand, for example, there is a strong emphasis on hands-on practical work at all levels of agricultural education. At university level, 'muddy boots' education (as it is termed locally), is the norm rather than the exception. In this paper, we describe how one New Zealand institution, Lincoln College, emphasizes practical work in its courses.

### **The College described**

Lincoln College was established in 1878. It is located on the Canterbury plains near Christchurch, a city of 300,000 people and the largest city in the South Island of New Zealand. The College has 600 hectares at the campus and 1606 hectares nearby (1 hectare = 2.47 acres). The College describes itself as a 'university college of agriculture' and is similar in size to the average agricultural college of a U.S. land-grant university in that it has approximately 1800 students in 1984. The degrees it offers are also similar to those offered by its U.S. equivalents. Four-year Bachelors degrees are offered in Agricultural Science, Horticultural Science, and Agricultural Engineering. However, the most popular degree offered is a three-year Bachelor in Commerce with options in farm management, agricultural economics, and valuation and property management. Unlike its U.S. equivalents, the College also offers a wide range of one-year courses which lead to Diplomas in Agriculture, Horticulture, Farm Management, Horticultural Management, Field Technology, Wool Technology, and Landscape Technology. Short courses of a few days duration are offered regularly on topics as varied as sheep shearing, microcomputers in farming, and welding.

Graduate students make up 250 of the College's 1800 students. These graduate students come from all over Asia, the Middle East, the Pacific, Western Europe, and the countries of the British Commonwealth. The College has strong masters and Ph.D. programs and also provides professional training for landscape architects in a two-year course for the postgraduate Diploma in Landscape Architecture.

The proportion of students with a farming background varies from course to course. While about 80 percent of the students taking a one-year Diploma in Agriculture have been brought up on farms, this

proportion drops to about half for those taking the four-year Bachelor of Agricultural Science and to about one-third for students enrolled for a one-year Diploma in Horticulture. The College has a tradition of being a male-dominated institution, but the number of women students has increased in recent years. In 1984, women make up over one-quarter of the student roll. Horticultural courses often attract more women students than men, but women also make up over one-third of this year's intake into the Bachelor of Agricultural Science program. (In New Zealand, 'horticulture' has a wider connotation than in the U.S. It includes many types of intensive cropping, including growing tobacco. A tobacco farmer is, in fact, a member of the national advisory group for horticulture).

### **Practical Work at Lincoln College**

The emphasis on practical aspects of agriculture permeates the whole institution. In the remainder of this paper we will briefly describe several examples of this emphasis - field trips, field tours, pre-entry work experience, in-course work experience, field tests, farmer-tutors, and farm supervision.

#### **1. Field trips**

Buses line up outside Ivey Hall at least two days each week of the academic year to take Lincoln College students to visit farms and other agricultural or horticultural enterprises. Gum boots, tea cauldrons, and clipboards are in evidence as the lecturers confer with each other and with the bus drivers. These field trips are half-day or one-day excursions in which one or more sites are visited. The students normally take their lunch with them. Many field trips play a central part in the case-study method used to teach farm management and involve students in the collection of information for use in an assignment, e.g. making a valuation of the farm or drawing up a budget. However, not every field trip requires a bus trip. The College farms are used for some visits and the campus itself is a virtual botanical garden and is used as such by ornamental horticulture students.

#### **2. Field tours**

The maximum length of a field trip is one day and this means that visits can only be made to farms near the College. To visit more remote farms it is necessary to make a 'field tour' lasting several days. These are also a common feature of many courses. As one lecturer said: "We take the students where their kind of agriculture or horticulture is, even if it is in the North Island." At the beginning of each academic year, the lecturers arrange tours of up to a week's duration with the help of the equivalent of extension agents and others. The cost of the tours is handled like a lab fee and is considered part of the charge for tuition. The tours generally take place in the last week of the academic term or during student vacations between terms. Each field tour involves a number of visits to farms, horticultural enterprises, related industries, and

research stations. On many tours, students are appointed to ask questions at each site. In some cases, the lecturers design test questions on the site for use back on campus, and the students watch their lecturers from the corners of their eyes to see what they note down as important enough for a test question. On most tours, the lecturers conduct evening seminars on the day's activities and those of the next day. In addition to the obvious educational reasons for these seminars, the lecturers find them useful for controlling the beer consumption of the students in the evenings.

### 3. Pre-entry work experience

Students who plan to enter the one-year course for the Diploma in Agriculture must enroll with the Distance Education Service of the College which assists them in finding farms to work on and conducts correspondence courses for these pre-entry students. The students for this diploma are required to gain 22 months of farm experience before taking the one-year course on campus. This experience must be split between the North Island and the South Island and must include two types of farms, for example dairy and sheep. The students are required to master at least 60 farm skills during this period and to complete a number of assignments in their correspondence course booklets. For example, they are required to draw up a map of the farm including soil types, to analyse the financial records of the farm and to analyze the paddock (field) layout and pasture rotation scheme. Regardless of their previous experience, overseas (foreign) students have to do a portion of their work experience on New Zealand farms. The Distance Education Service collects a fee from the pre-entry students to help with the expenses of its operation. Other one-year diploma programs offered by the College have somewhat different pre-entry work experience requirements, but all demand some practical work of the students before they enter the on-campus part of their course.

### 4. In-course work experience

Many Bachelor's degree students, unlike diploma students, are required to gain work experience after beginning full-time study on campus. They are not allowed to graduate until they have accumulated the prescribed amount of work experience. The duration and type of work experience varies among the different courses, but most students taking a three-year or four-year bachelor's degree are required to complete between 36 and 72 weeks of work experience. For example, students taking the farm management option of the Bachelor of Commerce degree are required to gain 72 weeks of experience with at least 48 of these being on one farm. These students must therefore either work for at least one year on a farm before starting on their formal course or take one year off to gain experience between the first and second academic years of their course. They accumulate the remainder of their 72 weeks by working through most university

vacations. On the other hand, Bachelor of Agricultural Science students must complete only 44 weeks of work experience, and it is possible to satisfy this requirement by working during most of the vacations of their four-year course. In all cases, the amount and type of experience is specified for each curriculum but is not varied for individual students within a curriculum. Some overseas experience can be credited in some cases if it is approved ahead of time.

The students must submit extensive written reports on the farms on which they have worked. These reports are due about six weeks after the end of the school vacation period in which the experience was obtained, and the submission of a late report incurs a monetary fine.

### 5. Field tests

Even final examinations at Lincoln College sometimes have a strong practical emphasis. This is especially true in the final year of their courses for undergraduate students who take farm management or rural valuation. These students complete their formal written examinations at the end of the school year and then remain for another week to complete what is known as a 'field test.' This is a five-day assignment based on a commercial farm. Each student is assigned to a different farm, and he or she is advised which farm it is to be on the evening before the test begins. That night, the student gathers as much information about the farm as he or she can from soil maps and other references. The next day a faculty member accompanies the student to the farm for the data-collecting phase of the test. The faculty member provides transport, but it is the student's responsibility to find the farm. The student spends most of the day on the farm collecting information by direct observation on a walk around the farm, discussion with the farmer and inspection of the farm accounts. The faculty member who accompanies the student evaluates the student's approach in collecting information from the farmer. This one-to-one supervision requires considerable staff resources and faculty members from all academic departments are asked to volunteer as supervisors. It is not uncommon for biochemists and mathematicians to supervise field tests; and one of the authors, an agricultural education professor on sabbatical leave from a U.S. university, was almost drafted into the job as well. One benefit of this program is that faculty members who have nothing to do with practical farming in their teaching programs are at least given an annual immersion in a farm environment.

The student then spends the next three days analyzing the data he or she has collected and writing a comprehensive report including recommendations for the farmer. The entire period, but especially the day of data collection on the farm, is a tense time for students; and they work extremely long hours to produce a massive final report. It is necessary for them to do so

because not only does the field test count for 40 percent of their grade for farm management and rural valuation, but it is also a course requirement that all farm management and rural valuation students must pass a field test to graduate. This requirement of actually being able to perform in a simulated professional capacity is yet another indication of the strong emphasis on the practical in Lincoln College courses.

#### 6. Farm-tutors

The Department of Farm Management at the College employs some local farmers as part-time tutors for students studying for the Diploma in Agriculture and the Diploma in Farm Management. These farmers use their own farms as a basis for case studies of farm management and also accompany the students on field trips to other farms and conduct small group discussions at the College. Again, the emphasis is on developing a practical orientation in the students, this time by using experienced practitioners as tutors.

#### 7. Farm Supervision

Faculty members from several College departments have responsibility for supervising one of the College farms. The faculty member meets periodically with the farm manager to discuss the operation of the farm. The faculty members visit the farm frequently and take an active part in planning the farm program. This practice is yet another way that Lincoln College encourages practical involvement in agriculture, this time amongst members of the teaching staff.

### Discussion

The seven examples we have described above give some indication of the emphasis on practice which is a feature of the educational system at Lincoln College. In our experience, it is an emphasis which is different in several ways from that in most U.S. land-grant colleges of agriculture. It is different in terms of its extent, in that it tends to permeate every major curriculum of the College. When a new degree or diploma curriculum is planned, elements of practical work are automatically included. It is taken for granted that practical work will be required of the students and any discussion focuses on how much will be required and how it will be organised. Another obvious difference between practical work at Lincoln College and that in most land-grant colleges is its compulsory nature. There is no question of offering farm experience as an elective for non-farm students. All students are required to complete the prescribed practical work before graduation. In part, this probably reflects the more prescriptive nature of agricultural degree courses in New Zealand, but it is also an indication of the importance placed on farm experience at Lincoln College. The other clear difference lies in the nature of the work experience required. Nearly every student is required to spend many weeks as a farm worker or horticultural worker. This is true whether the student is taking a Diploma in Agriculture with the aim of being a

farmer or a Bachelor of Agricultural Science with the aim of being an extension agent or research scientist. The work experience program clearly has goals different from a typical internship program. The main goals are not 'to enable students to learn more about the occupation of their choice' or 'to allow students to experiment with vocational goals' (Fog, 1980). Nor is the program aimed at obtaining jobs for the students when they graduate (La Prad, 1977). Instead, its main aim is to enable students to develop some basic farm skills and to encourage them to get a 'feel' for the agricultural industry at a producer level.

The emphasis on practice has a long history at Lincoln College, and it has been an accepted part of the educational system for many years. Recent surveys have shown that field trips and field tours, in particular, are highly valued as learning experiences by both students and lecturers. There is therefore a strong institutional commitment to practical work. Many lecturers are former students who have experienced field trips, field tours, and field tests throughout their own college education and see them as natural components of agricultural education. Some of them would probably not even recognize the seven examples we have described here as facets of Lincoln's emphasis on practical work. Most lecturers are well aware, however, that Lincoln College has a reputation for producing well-prepared practical graduates and would ascribe this to the farm-oriented 'muddy boots' approach described in this paper. At Lincoln, a pair of good boots and waterproof clothing are as much a part of student equipment as notepaper and pen.

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