

Table 4. Percentage distribution of horticultural students by field of specialization. ¹

Field of specialization	Year of enrollment									Total
	1968	1967	1966	1965	1964	1963	1962	1961	1960	
Ornamentals	78.7	75.0	67.7	67.7	75.0	74.1	-	61.5	61.5	72.5
Georgia	37.5	28.2	48.3	56.5	67.1	45.0	-	50.0	62.5	43.0
Out-of-state	62.5	71.8	51.7	43.5	38.9	55.0	-	50.0	37.5	57.0
Pomology	8.2	15.4	29.0	17.6	12.5	7.4	-	23.1	23.1	15.3
Georgia	40.0	62.5	55.6	66.7	66.6	50.0	-	66.7	100.0	61.5
Out-of-state	60.0	37.5	44.4	33.3	33.3	50.0	-	33.3	0.0	38.5
Olericulture	8.2	7.7	3.3	8.8	8.3	14.8	-	7.7	0.0	7.8
Georgia	60.0	75.0	100.0	100.0	100.0	100.0	-	100.0	0.0	85.0
Out-of-state	40.0	25.0	0.0	0.0	0.0	0.0	-	0.0	0.0	15.0
Gen. Hort.	4.9	1.9	0.0	5.9	4.2	3.7	-	7.7	15.4	4.3
Georgia	66.7	0.0	100.0	50.0	0.0	100.0	-	100.0	100.0	63.6
Out-of-state	33.3	100.0	0.0	50.0	100.0	0.0	-	0.0	0.0	36.4

¹ Data obtained from Department of Horticulture student records.

Table 5. Percentage distribution and number of Georgia residents majoring in horticulture by field of specialization. ¹

Field of specialization	Year of enrollment									Ave.
	1968-69	1967-68	1966-67	1965-66	1964-65	1963-64	1962-63	1961-62	1960-61	
Ornamentals	68	63	64	62	74	60	-	50	50	65
Pomology	9	21	29	19	13	6	-	26	30	17
Olericulture	14	16	7	14	13	28	-	12	0	7
Gen. Hort.	9	0	0	5	0	6	-	12	20	11
No. of Georgia resident majors	22	19	14	21	15	15	-	8	10	

¹ Data obtained from Department of Horticulture student records.

Table 6. Percentage distribution and number of New York residents majoring in horticulture by fields of specialization. ¹

Field of specialization	Year of enrollment									Ave.
	1968-69	1967-68	1966-67	1965-66	1964-65	1963-64	1962-63	1961-62	1960-61	
Ornamentals	100	85	71	89	100	100	-	100	100	90
Pomology	0	5	29	11	0	0	-	0	0	10
Olericulture	0	0	0	0	0	0	-	0	0	0
Gen. Hort.	0	0	0	0	0	0	-	0	0	0
No. of New York resident majors	21	20	14	9	6	6	-	3	2	

¹ Data obtained from Department of Horticulture student records.

Table 7. Percentage distribution and number of non-Georgia residents (other than New York residents) majoring in horticulture by field of specialization. ¹

Field of specialization	Year of enrollment									Ave.
	1968-69	1967-68	1966-67	1965-66	1964-65	1963-64	1962-63	1961-62	1960-61	
Ornamentals	64	76	66	50	0	83	-	100	100	65
Pomology	18	8	34	25	50	17	-	0	0	17
Olericulture	12	8	0	0	0	0	-	0	0	7
Gen. Hort.	6	8	0	25	50	0	-	0	0	11
No. of non-Georgia resident majors	17	12	3	4	2	6	-	1	1	

¹ Data obtained from Department of Horticulture student records.

"De-Schooling Horticultural Education"

The Horticultural Industry In Illinois Is Making An Opening Bid.

By Ted Buila and Bill Jahn

Ted Buila is a member of the Agricultural Industries Department at Southern Illinois University at Carbondale. Bill Jahn is the Director of the DuPage Horticultural School in West Chicago.

Horticultural education is not the Penn Central. Granted. But the question both face, and the horticultural industry as well, is essentially the same. Can they be salvaged?

The good fairy Rail Pax may piece together a bankrupt Penn Central. Horticultural education and the industry may not fare so well.

Inside the horticultural industry it's no secret that only a small handful of schools can be depended on for graduates with enough skills and horticultural common-sense to step into

the industry without having to be watched every moment. Practical horticultural instruction has collapsed in most agricultural colleges and schools. Perhaps this is what the industry wants? After all, no one has growled very loud to stop the deluge of Liliputian curriculum-crumbs that have all but buried a once sound core of skills under layers of educational humbug.

In fact, one could make a good case that some of us have been all too eager to remain at graveside. Look at one of the immediate results of "cooperative research." A donation of a \$21.95 pint of growth regulator gets the manufacturer a couple of hundred square feet of bench space and some rather expensive labor — all at sweatshop prices. But most important, instruction-time has been re-directed at the pint . . . away from the student. Aside from turning horticultural education into a no-touch spectator sport a few firms are turning a neat profit. As Jimmy Breslin would say, "Shakespeare wrote a big thing about this kind of action."

The industry has a vested interest in practical horticultural instruction. While it includes searching-out the answers to production and marketing problems, it transcends research activity alone. The schools, we would like to think, are training/educating a new generation of horticulturists that can step into the give-and-take of the marketplace to work as dynamic participants.

As we've suggested, something is happening in our schools — and it can't be blamed on long hair — that we don't get a lot of pleasure watching. Namely, the agricultural college administrators (deans, chairmen, and teachers) are running scared. All too many programs at the secondary and college level are in dire jeopardy. Educational costs are up and enrollments are down. In order to buy time, and this has been going on for at least ten years, many administrators have opted to show a profit, that is, do the job of educating at a lower price per head than their colleagues across campus. Two tactics have proven "successful" to date. First, more and more outside learning (hands-on, closely supervised laboratory and field exercises) is being transferred to the classroom with occasional antiseptic bus trips "back outside." Secondly, staff are being encouraged (certainly not actively discouraged) to collect as many "pints" from private and public donors as possible.

The immediate effects are twofold: practical learning has been judged too costly and in turn is being gutted from the schools with the schools taking on an insular quality.

Effetism in horticultural education can be breached with a bit of common sense.

We are used to considering schools and horticultural instruction/learning as one. I think all of us would agree that all learning is not dependent on the school . . . yet we are used to thinking so. Surely, and this is the case we are building, more horticultural learning — at least in our generation — has come by way of "apprenticeship-learning" than through the traditional school.

In fact, most occupational instruction and learning is more closely related to the firm than the school. What is being suggested is that a new horticultural education must be styled. And to accomplish this task one of the first places to start is by de-schooling present and future programs by welding them to the marketplace. What is being suggested as a first step is the mutual sharing, by the students, of industries learning resources: people, materials, and physical facilities.

For example, in the earlier grades, this might take the form of what is called curriculum enrichment: the sharing of plant materials and garden plots with a local park district or perhaps working with park district personnel in community landscaping projects. Another idea might be the use of the local florist to teach color harmony and geometry (simple of course but quite practical) with living materials. Why not?

In the middle and advanced grades, no stone should be left unturned in arranging for students to work and learn (with school credit) along side employees of local horticultural firms. The oftentimes dusty biological concepts teachers have a hard time getting across to students are best left to men and

women who earn their living by using them. In addition, helping students learn what makes the customer tick is best learned on a backdrop of "how to stay in business and show a profit."

Where then do we start the task of de-schooling horticultural education?

Some schools have the internal capacity to pull themselves into the daylight of the marketplace. We have doubts if the colleges fall into this group at the time being. Others quite clearly cannot get the job done by themselves. But by far the largest group include elementary and high schools and junior colleges that don't know that practical green biology exists (horticultural education)! In either case, bread-and-butter leadership must be forthcoming from the industry to start the de-schooling process.

There is one key figure in the major effort ahead. This is the classroom teacher. He or she might be a science teacher, an art teacher, an agricultural teacher — really any teacher with a quality of spontaneity and affinity to horticulture. The grassroots leadership needed to breathe life into old programs and then sustain them once they become viable, is, in the final analysis, in the hands of the teacher. It is suggested that it's a much easier task and profitable to make administrators "aware" than to have the administration make a teacher teach something he or she may only be mildly interested in.

The "now" task for the industry is to identify local teachers who are locked-in on horticulture. Working through these highly motivated teachers, the industry can help the teacher develop the grassroots leadership necessary to sell local administrators and just as important gain student participation for program offerings. Teacher leadership is really the key when it comes to raising the horticultural awareness of the community to in turn assist in sustaining the school's program through support from the district's taxpayers.

One practical example of HOW the industry can start to de-school horticultural education by zeroing-in on the teacher can be found in the initiation of a Horticultural Skills Practice Institute for fifteen Illinois elementary and high school teachers in October, 1970.

Briefly, the Research & Development Unit of the Illinois State Board of Vocational Education gave the green light to Bill Jahn, at the DuPage Horticultural School, Inc. (a non-profit private industry supported school next door to the Geo. Ball Co.), in West Chicago and Ted Buila, at Southern Illinois University at Carbondale, to come up with a teacher re-education that meets the industries' specifications . . . and then make it go!

The Institute focuses on creating a "new" educational relationship between the teachers and horticulture — one that the teachers will be able to take home and "reproduce." To foster the new relationship the learning situation structure has been boldly altered along these lines:

—Virtually all learning takes place in an unsimulated commercial setting: in greenhouses, range work, in firms, and working in public and private landscape settings.

—Learning takes place in season, as it occurs in industry, utilizing commercial materials and equipment.

—A sharp emphasis is given to hands-on skills development taught and supervised by "employees."

—Almost complete access to generally untouchable horticultural learning resources: people, materials, equipment all in a natural learning setting.

The immediate goal of this private industry drenching "of the way it is out there" is to develop a new set of learning orientations. These in turn will be translated to change programs, both curriculum and facility changes, in the teachers' home schools.

Institute activities have been scheduled into six separate sessions, two to three days each, running from October, 1970 through August, 1971. In addition, commercial workouts are dove-tailed into the 1971 summer session both in the greater Chicago area and in home communities.

Teacher reaction is extremely positive to date even though they're a mixed-bag. Eight are high school agricultural teachers, seven are from elementary or junior high schools (non-agriculture) with a principal and two women being

represented in the group. Bill Hills from Naperville and Sharon Pelc from Cahokia pretty well sum up the feeling of the teachers after the fourth session (January 30 - February 1). Bill, "the information I'm getting is not theory but something I need to improve my program . . . someone is always over my shoulder giving me a hand." Sharon, "the look but don't touch attitude is dropped . . . I only wish my college education was half this practical . . . my hands are always dirty . . . maybe that's the way it should be."

The Illinois attempt to de-school horticultural education with a blend of industry participation in which learning takes place in the marketplace is a simple and fascinating approach

to the problem. The precise form that the education blend might finally take cannot, of course, be discerned at this point and, in any event, it will surely be dynamic once local teachers and industry get their oars in the pot. We'll have to wait right now for the next step in the de-schooling process. As the fifteen 'Seedstock' teachers push ahead we will sketch the path.

One thing for sure, the horticultural industry in Illinois has made an opening bid in not opting for a black tie educational program in horticulture. What's the industries' bid going to be in other states?

A Comparative and Factor Analytic Study of the Knowledges and Skills Needed in Agricultural Supply Businesses

Hollie B. Thomas
Assistant Professor
University of Illinois

by

George W. Leighty, Instructor
Agricultural Occupations
Mulberry Grove, Illinois

Agricultural supply programs at the junior college level in Illinois started with one program in 1964. Since that time, programs have emerged in various stages of development in many of the junior colleges.

Because many of the agricultural supply programs in Illinois junior colleges were in their infancy, it seemed desirable to determine (1) whether there was agreement with regard to the knowledge and skills needed by employees in this field among the student trainees who had been on placement, the employers where the students were placed, and the instructors who taught the agricultural supply courses that the student trainees were to take while on campus, (2) if there were differences among the ratings of agricultural supply knowledges and skills given by employers in the various types of agricultural supply businesses, and (3) if factor analysis could be used to group knowledges and skills into meaningful instructional categories.

Answers to these questions were sought in a study conducted by the researchers with the cooperation of eight junior colleges in Illinois.

It was anticipated that the information gained by this study would be of assistance to instructors in planning educational experiences and adjusting programs to meet the expressed needs of the student trainees and their employers.

Procedures

To answer the questions posed, a 100-item questionnaire of knowledges and skills essential to agricultural supply programs gleaned from the literature along with some distractors was developed and mailed to three populations. These populations were instructors in agricultural supply programs, student trainees who had completed on-the-job training in an agricultural supply business, and the employers of the businesses in which the students were placed. Each individual in the three populations was asked to rate the degree to which the knowledges and skills are essential for an employee in an agricultural supply business to know or be able to do. Responses were recorded on a nine-point scale which ranged from very essential to not essential.

Response to the mailed questionnaire included 54 student trainees, 56 employers, and 14 instructors; 68.4 percent, 71.8 percent, and 100.0 percent, respectively.

Results

Significant differences at the .05 level among the mean ratings given by the employers, student trainees, and instructors to the agricultural supply knowledges and skills were obtained for these items when the analysis of variance procedure was employed: filling out order blanks, mixing chemicals, identifying insects of livestock, knowing food and transportation laws affecting livestock. Ratings of these items were consistently higher for the instructors than for the employers.

Employer respondents were divided into six categories for the purpose of comparison. These were:

1. Seed
2. Fertilizer
3. Fertilizer-petroleum
4. Grain-feed
5. Grain-seed-feed-fertilizer
6. Any additional combinations of feed-seed-grain-fertilizer or petroleum.

As shown in Table I significant differences were obtained among the mean ratings given to the knowledges and skills by the employers in the various categories of agricultural supply businesses for 46 of the 100 items. Thus slightly over one-half of the knowledges and skills were equally essential in each of the six identified areas, identifying a core of knowledges and skills for which trainees in the agricultural supply areas identified will need equal preparation and experiences. These

knowledges and skills could provide the basis for training plans for each agricultural supply area. Keeping records of sales and figuring a balanced ration are illustrations of the items which received a uniform rating from employers representing the six areas. This uniformity is indicated by the absence of a significant difference among the average ratings given by the employer groups. An item illustrative of those which did not receive a uniform rating, as indicated by the significant levels of .05 and .01, from the employers is identifying noxious weeds. As might be predicted, employers in the seed industry rated the item as being essential, while those in the fertilizer business rated it as being nonessential.

The average rating received by each knowledge and skill from the employer groups was considered to be low (L) if the average rating was below 3.67, medium (M) if the average rating was between 3.67 to 6.33 and high (H) if the average rating was 6.33 or higher. These notations (L,M,H) are reported for each item by employer groups in Table I.

The items that received an average rating of four or greater on the nine-point scale from the three groups were subjected to Varimax factor analysis. This analysis yielded six meaningful factors (groups of items) which were named:

1. Knowledges and skills in feed, seed and fertilizer businesses.
2. Livestock industry knowledges and skills.
3. Sales and business operations in agricultural supply businesses.
4. Management of agricultural supply businesses.
5. Work habits.
6. Interacting with customers.

A knowledge or skill item was assigned to the factor for which the highest factor loading was obtained. Knowledges and skills included in these factors are grouped in Table I in descending order of the factor loadings. Thus, the first items in each factor are the most descriptive of the factor. These factors present a possible grouping of knowledges and skills that could serve as a core for units of instruction in agricultural supply courses.

Many items were related to more than one factor, hence, clear-cut factors did not emerge. Factors such as management of agricultural supply businesses appear to have more than one concept involved. These concepts are, however, related statistically in some way. Items in this factor such as advising farmers on feeds and management practices, figuring sales tax on a ticket and reading product tags and labels are clearly related to the interaction and communication of the employee with the customers. On the other hand, items such as collecting soil samples and loading and unloading supplies, are less related to customer-employee interaction. However, these activities are directly related to services provided to the customer.

Conclusions

Instructors of agricultural supply courses in Illinois junior colleges have an accurate perception of the degree to which knowledges and skills are needed in agricultural supply businesses in general. This conclusion was based on the fact that when the various types of agricultural supply employers were grouped together there were few differences among the ratings of the employers, student trainees and instructors. The researchers concluded that it is best to meet the training needs of the industry in general rather than one specific agricultural supply business, such as seed supply.

From the many differences and similarities which existed among the ratings that employers in the various types of businesses gave to the agricultural supply knowledges and skills, it may be concluded that some knowledges and skills are useful in all the types of agricultural businesses surveyed while others are useful in one or more types of businesses. Hence, the ratings of these items provide a basis for the