

and educational technology. Our ancestors would be absolutely amazed if they could see the plethora of extension technologies that we have available today — audio-cassettes, television, videotape, computers, teleconferencing, computer conferencing, satellite delivery, etc. Each of these has immediate application to adult and extension education; the key problem is deciding how to use these new technologies to deliver education. We have the hardware; what is needed now is to develop quality software.

Much of this technology is being used in what we refer to, in Canada, as distance education — systems designed to extend education in a non-face-to-face situation. Many of these technologies are typical of the 1980s — many were not available five years ago. Each of them holds new and exciting potentials for the way in which education is delivered to those who cannot afford the luxury of two or four year residential lear-

ning experiences. They will be particularly useful in extending professional development learning opportunities — the computer disk, the videotape and the telephone and satellites really can be of tremendous benefit in reaching out to new clientele groups.

Summary

The ten scenes are part of the adult education landscape of 1986, changing scenes and landscapes that provide us with new ways of looking at education in the future. It is an exciting field and a field that has the potential of having tremendous impact on the teaching and learning styles of our traditional classroom settings. As we face the future, it is up to each of us to explore and learn, to create and imagine, to challenge and question, and to review and plan. That is what adult education is about in 1986 — truly a changing scene.

Reflecting On Quality Teaching

Robert C. Kirst

I would like to share a story with you. As a freshman at Louisiana State University I was a vagabond, not sure of where I was going or what I was doing. I majored in petroleum engineering because of the influence of a high school teacher. After several semesters I changed my major to animal science, still not sure of what I would do if I were to earn a degree. I eventually completed the degree but had not given up my vagabond status.

During graduate school the focus was on training for research, never dreaming that some day my primary responsibility might be teaching.

My first job after graduate school was teaching. Not having any training for this occupation, and knowing that I would have to be in the classroom, I began to try to figure out what I was going to do. Since time would not allow me to go back to school, I began to look at the teachers from whom I had learned the most. Based on recollections of my outstanding teachers, I decided to "do unto others as I had been done unto". Over the years this philosophy has served me well. You often hear "when in doubt, punt", but when punting isn't an option, copy the best plays. When I studied the characteristics of the best teachers I had had, I found three qualities were consistent among them: commitment, enthusiasm along with honesty or fairness.

Commitment meant that they remained current, not only in their field but in associated fields. These were not men who said everything they had to say in the first lecture and expounded on that from then on.

Address presented by Robert C. Kirst, University of Arkansas at Monticello, as the incoming NACTA president during the 32nd Annual NACTA Conference, Ridgetown College of Agricultural Technology, Ridgetown, Ontario, June, 1986.

They read, they studied, they grew professionally. Commitment also meant dedication to the student as an individual. They listened to both my head and my heart. Their commitment was not to promote their agenda but to aid me in my search. They related to my personal needs and helped me negotiate the system. As a freshman had I been able to find my advisor, I might be a petroleum engineer today.

The teachers whom I chose to copy also appeared to be eager to share their information with the student. They were good salesmen for their products. They found ways of packaging their information to make it stimulating and entertaining so that I looked forward to going to their classes. A student once told me that he didn't "give a damn about trees, but when Mr. Townsend talks about them, I'm sitting on the edge of my chair". Hal Townsend was one I chose to copy.

Although commitment and enthusiasm were paramount qualities in each of the teachers I admired most, honesty or fairness was their cornerstone. Student evaluations were based on impartial judgments. Grades were given on the basis of a student's performance and not the professor's ego.

After a number of years of teaching, I discovered an organization called NACTA. I attended a NACTA annual conference only to discover that one of the men I had been copying, my field crops instructor, Russ Miller, was the Southern Director. Since that beginning, I have found that NACTA is an organization of involved, dedicated and enthusiastic educators.

Just as Russ Miller profoundly touched my life, we as teachers touch the lives of students never knowing how many of them are vagabonds. This is why NACTA must remain a wellspring to refresh and revitalize the dedication, honesty and enthusiasm of each of its members. No one shares a cup of cold water from an empty bucket.

The Number of Graduates Needed in Agriculture

G. M. Jenkinson

I plan to initially present a summary of the recommendations and data contained in the Report of the Agricultural Institute of Canada (January 1986) entitled "Demand and Supply Trends for Agricultural Professionals in Canada". The report is an assessment of the supply and demand of B.Sc./M.Sc./Ph.D. graduates in agriculture in Canada for the period 1980-1990. I would then like to comment on the data, its significance to Canadian agriculture, and its relationship to similar studies conducted in the United States.

The report to which I refer was released in January 1986 by the Agricultural Institute of Canada. The data was collected in March-June 1985 by Dr. E.B. Harvey of Urban Dimensions, Toronto. Two groups of respondents were surveyed simultaneously; 148 employers of agricultural degree graduates responded as did 222 people with informed opinions. The response rate for each group was 50%, a level quite acceptable to the consultant.

Conducting two surveys simultaneously provides a measure of corroboration and replication of the data. There was a high degree of similarity in the data collected and in the conclusions and recommendations from each survey.

The surveys were national in scope and included respondents from all sections of Canada (Table 1); they were well representative of the various employment sectors (Table 2).

The 148 employer respondents combined to employ 1832 bachelors degree graduates in 1980 as compared to 2019 graduates in 1985 - an increase of 2% per annum during the five year period. These same respondents project a total of 764 new B.Sc. hires over

Table 1. Geographic Origin of Respondents

	EMPLOYERS	INFORMERS
B.C.	6%	7%
Prairies	31%	32%
Ontario	43%	38%
Quebec	6%	5%
Atlantic	14%	18%
	100%	100%

Table 2. Sectoral Distribution

	EMPLOYERS	INFORMERS
Government	31%	35%
Agencies and boards		
Association/education	10%	23%
Private Sector	59%	37%
Other	-	5%
	100%	100%

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Table 3. Projected Hires 1986-87

	B.Sc.	M.Sc.	Ph.D.
Agr. Economics/Business	32%	31%	11%
Plant Science	19	22	27
General Agriculture	16	na	na
Agr. Biology	na	11	12
Food Science	8	17	8
Animal Science	8	4	9
Soil Science	7	11	17
Engineering	6	3	7
Horticulture	4	1	7
Total hires of 148 employers	575	91	98

Table 4. Supply/Demand - B.Sc. Levels

1980-85

- 148 employers increased their employees with Agriculture degrees by 10% over 5 years

- 5824 graduates produced by Ag colleges in Canada 1985-90

- stronger demand for graduates than 1980-85 period
- 4827 graduates projected (17% decline)
- private sector stronger than public sector
- strength in banks, consulting, food processing and chemicals
- weak in animal science, engineering and horticulture

Table 5. Demand For Professionals In Canadian Agriculture, 1986-1990

	B.Sc.	M.Sc.	Ph.D.
STRONG DEMAND	Agr. Economics Plant Science	Agr. Economics Plant Science Food Science	Plant Science Soil Science Agr. Biology
WEAK DEMAND	Horticulture Agr. Engineering	Horticulture Agr. Engineering Animal Science	Horticulture Agr. Engineering

the next two years (1986-87). Agricultural Economics/Business and Plant Science rate as the areas of strongest demand with Engineering and Horticulture being the areas of lower rates of employment at all degree levels (Table 3).

What about the supply of graduates? Enrollment at the B.Sc. level has been declining for the past ten years. During the next five years (1986 to 1990) 17% fewer graduates are expected in Canada (Table 4). In Ontario we estimate that there will be a 35 to 40% decline in the number of graduates in the 1986-1990 period as compared to the 1981-1985 period. Obviously there will be an increasingly acute shortage of graduates and the AIC report has identified the areas of greatest deficiency.

The number of M.Sc./Ph.D. graduates has been increasing during the last five years in Canada. Supply is now approaching demand as a result of this increase. Demand has moderated in recent years as the number of positions in agricultural faculties and at research stations is reduced to meet annual budget reductions.

A summary is provided for all degree levels in Table 5, pointing out areas of strength and weakness for each degree level.

Buffers in the System

Agricultural colleges have traditionally graduated students who did not seek employment in agricultural industry at graduation but went on to graduate study or who returned to the family farm. The number of graduates who do not seek employment in agricultural industry varies from a low of 10% to a high of 25% in each category (Table 6).

Table 6. Post Graduation Activity O.A.C. Graduates

	1975	1980	1985
Industry	19%	29%	34%
Government	20%	8%	9%
Other	11%	8%	2%
Farming	18%	21%	13%
Further Education	16%	16%	24%
Foreign Service	2%	3%	3%
UNK/Unemp.	14%	15%	15%
	100%	100%	100%

These two groups collectively vary from 25% to 50% of the class depending on employment opportunities, farm prices, commodity outlook and other factors in a given year. In Canada the difference from low to high is 300 graduates annually. This buffer group will expand or shrink and give us a margin of safety against severe shortages and/or excess supply. In the long run, however, we are headed towards a deficiency of B.Sc. graduates in agriculture in Canada.

The primary summary message from the consultant states "if agricultural degree programs are to maintain an acceptable share of the total post secondary enrollment, efforts will have to be made to communicate more effectively the diverse nature of careers in agriculture and the potentially attractive employment opportunities available." This is a message we have all heard before and I find it of significance in that it is included in a labour consultants report.

Observations and Conclusions

- I believe the report underestimates the demand for horticulture graduates. On subsequent examination we found that the number of horticulture respondents is so low as to render any ranking of this area of the study null and void. Horticulture employers were surveyed, but for some reason they did not respond to any extent.

- Animal science has been the largest area of study in terms of numbers of graduates during the past 20 years. The report suggests that animal science graduates will be in lower demand and the present weakness is employment in the feed and farm supply industries is compelling evidence. Clearly the "buffer capacity" will be of significant influence in animal science, particularly in relation to the number of graduates going farming.

- In addition to the usual emphasis by employers on writing and communications abilities there is a strong indication that preference will be given in the future to those graduates with financial analysis and computer skills.

- Studies recently conducted by USDA (Coulter et al) show a high similarity to the AIC findings. An ongoing comparison of the two countries in this area will be useful in the future.

- Although no reference was made in the AIC study to graduates from two year programs it would be interesting to conduct a similar study at the diploma level in Canada. There is some opportunity for diploma holders to substitute for degree holders when employment is tight, particularly in areas such as animal science and general agriculture.

- The employment of women at the B.Sc. level has increased dramatically in the past 15 years, particularly in the areas of horticulture and food science (Table 7). Employment of female M.Sc. and Ph.D. graduates is significantly lower at present, but is expected to increase over the next few years.

Table 7. Female Employment

	B.Sc.	M.Sc.	Ph.D.
% Positions Filled By Women (148 Employer Respondents)			
Horticulture	45%	12%	5%
Food Science	42%	3%	8%
Plant Science	22%	13%	9%
Agr. Economics	20%	8%	7%
Animal Science	10%	3%	8%
Soil Science	7%	11%	0%

The AIC report identifies areas of strong demand for B.Sc. graduates in agriculture. An increasing deficiency of graduates is projected over the next five years. I believe, however, that the number of graduates who have gone farming or who are now in graduate school serves as a buffer in the system. It would be wrong to predict disastrous shortages in the number of agriculture graduates. The report is helpful in identifying areas of greatest strength and the expertise required at each degree level. The report should be updated periodically (perhaps every five years) for future reference and use.



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