A Curriculum Content Analysis of Master's Degree Programs in Agricultural Economics: A Study of Selected Canadian and U.S. Schools

Fredoun Z. Ahmadi-Esfahani

Justinian C.J. Galabawa

Staff Paper No. 89-10

June 1989

The authors are, respectively, Assistant Professor and Post Doctoral Research Assistant, Department of Rural Economy. Financial assistance of the Department of Rural Economy is gratefully acknowledged.

Table of Contents

A Curriculum Content Analysis of Master's Degree Programs In Agricultural Economics: A Study of Selected Canadian and U.S. Schools

Introduction

The graduate school is where the making of a professional agricultural economist takes place. The nature and direction of the graduate programs, at least to some extent, determine the nature and direction of the profession of agricultural economics. Solow once stated that "To say that something is wrong with graduate education is to say that something is wrong with the economics profession" (Colander and Klamer 1987, p. 100). Kuttner, reiterating the concerns of Leontief and Galbraith, has been cited to suggest that "departments of economics are graduating a generation of *idiots savants*, brilliant at esoteric mathematics yet innocent of actual economic life" (Colander and Klamer 1987, p. 95).

Although they have been praised by some economists including Leontief for doing a good job in applied work, agricultural economists have been criticized from within their own profession. For example, in his 1967 Presidential address, Bishop, the former President of the American Agricultural Economics Association (AAEA), suggested that "If agricultural economists are to perform active roles as structural and policy analysts,... it will be necessary for us to make basic changes in our philosophical approaches to problems, our analytical tools, and our relationships to colleagues in other disciplines.... In order to increase our usefulness in coping with problems of economic structure and public policy, we must break the bonds of pure competition and extend our analysis to problems that transcend market phenomena. We shall need a new welfare economics that provides us with a better theory of social investment and focuses more sharply upon the distribution of costs and benefits from public policy. ... While we must lean even more heavily to economics, we must also become more knowledgeable about the tools of the sociologists and the political scientists." (Bishop 1967, p.1007)

The main purpose of this article is to report the findings of a study on the curriculum content analysis of Master's degree programs in agricultural economics in North America. Recommendations are also made on what can be done to improve the relevancy of these programs. Previous studies, as shown below, have used publications and citations from a set of literature or journals to indicate the quality of agricultural economics departments' work. The present study departs from this procedure by using as a benchmark a curriculum course

content and course objective prescriptive model. The study seeks to use the constructed model to describe, evaluate, and compare the current state of Master's programs in agricultural economics in Canada and the United States and to suggest desirable directions for future programs.

More specifically, a) some general observations are made regarding the utility of the agricultural economics programs and the type of research that has been done regarding the quality of agricultural economics programs, b) a curricular model for Master's degree programs is constructed based on a set of propositions on knowledge contents and knowledge objectives for students, c) empirical information on course requirements, course concentrations, research and extension requirements and evaluation procedures is compiled from the graduate calendars of fourteen departments of agricultural economics in Canada and the United States, and d) the empirical findings from the calendars are tested against the curricular model and the results are used to make recommendations for improving agricultural economics Master's degree programs.

Status and Quality of Agricultural Economics Departments

In their study on the status of Master's programs in economics, Thornton and Innes (1988) concluded that "the necessary elemental aspects of such a Master's program are less in evidence today than they were thirty-five years ago" (p. 178). This conclusion was based on the authors' strong belief that most of economics Master's programs' teaching reflected much of orthodox logical positivism. Earlier work by McCloskey (1983) had shown the "amalgam of logical positivism" and its derivatives, namely behaviorism, operationalism, and the hypothetical deductive model of science, to be inappropriate in teaching graduate economics. Johnson (1983) considers logical positivism as an inadequate philosophic underpinning for problem solving and much subject matter work since it precludes objective research on values which are considered essential for objectively defining and solving problems.

Positivism also impacted agricultural economics in many universities at the same time it was impacting general economics. The impact came from the desire to be "scientific" and to be as productive as the biological and physical scientists (Johnson 1983). The orthodox agricultural economics curriculum takes institutions as given. The social and professional responsibilities of agricultural economists to question the relevancy of public policy is seldom appreciated and therefore not reflected in the curriculum content knowledge. As a result, among graduated agricultural economists the emphasis is on production and profit or

private returns at the expense of distribution. Students and professors of agricultural economics predict and explain the behaviour of farm managers, farmers, and consumers in positivistic terms without normative propositions (values and prescriptions) concerning utility and profit maximization.

While emphasizing the positive contribution of the neoclassical economic theory, it is also possible to raise to students some theories that bring attention to the many conflicts of interest raised by any economic development process (Petit 1981). For example, in addition to what the price system can do, a grasp is needed of what it cannot or does not do, and the conditions under which it does not achieve intended results (Waelti 1988).

Approaches to Agricultural Economics Departmental Quality Measurement

Several researchers have used different criteria to evaluate agricultural economics departments' performance and quality. Klemkosky and Tuttle (1977) ranked doctoral programs by published research contributions of graduates and amount of research grants awarded to faculty. The reason for using published research as a criterion is that it is recognized by many academic institutions as one of the major criteria used in making faculty promotion and tenure decisions.

The Klemkosky and Tuttle study found that the research productivity of an institution's graduates was also one of the determinants of peer recognition of a quality doctoral program. This finding would appear to have been supported by an earlier study by Siegfried (1972) which had found a significant relationship between peer ratings of economics departments and the number of available pages contributed by the department to the leading economic academic journals.

Holland and Redman (1974) provide a survey of the affiliation of authors contributing to the American Journal of Agricultural Economics (AJAE), arguing that "AJAE contributions... represent one of the several important indicators of departmental quality" (p.784). However, this procedure was criticized by Opaluch and Just (1977) because smaller departments may publish less than larger departments but still publish more per member.

In their study on institutional affiliations of authors of contributions in agricultural economics for the period 1968-72, Opaluch and Just added the following variables in ranking departments: pages per teaching-research faculty and pages per faculty including extension. The results of the study indicated that the addition of the extension and research

components increased the separation between schools although the rankings were not affected appreciably. In particular the University of California - Berkeley still ranked first, however the University of California - Davis was displaced from second place by Oregon State or the University of Wisconsin, depending on whether extension staff is included in departmental size. All four departments were still in the top five by the Redman or Opaluch and Just rankings.

Other variants of ranking agricultural economics departments by journal contributions have recently been used (Tauer and Tauer 1984, Simpson and Steele 1985, Beilock, Polopolus, and Correal 1986, Beilock and Polopolus 1988). The approaches vary from those studies which measure productivity as indicated by the number of pages and articles that faculty and graduates have published in the AJAE to those studies that rank department by citations from a broad array of publications of departments' faculty.

Although journal output is used because it is more inclusively measured, a minimum quality level is confirmed, and because of the importance of journal articles in promotion and salary decisions (Tauer and Tauer 1984) it has some weaknesses. These are some of the weaknesses: 1) the rankings are based upon page counts of one "top" journal or a small set of selected journals (Beilock and Polopolus 1988), 2) the effects of joint authorship and self-citations on the ratings is difficult to quantify, 3) the differences in rankings are considerable depending upon the literature bases or definitions of valid citation types, and 4) three important activities of agricultural economics departments are not evaluated. These activities are teaching, research, and extension. Some faculty members and graduates who do not publish in journals may substantially contribute to productivity in some other equally important ways such as teaching, unpublished research, consultancy work, and extension field trips.

The study of effectiveness of agricultural economics departments is still in its incipient stage with various perspectives and emphases being advocated by different theorists. Beilock and Polopolus (1988) call attention to the difficulty of evaluating agricultural economics programs, including the sticky problem of attribution, since the evaluations will have to be done in an environment where many other change agents and social economic factors will be operating to affect the outcome. A study by Fienup and Riley (1980) sponsored by the AAEA indicated the direction of new efforts to evaluate agricultural economics departments by identifying some of the weaknesses in U.S. training. These weaknesses included the following: 1) insufficient attention to political, social, and

institutional factors in development, 2) lack of application of theory and research methods to problems, 3) the need for better appreciation of shortcomings of traditional economic theory as well as its strengths for conceptual and analytical purposes, 4) too little emphasis on problems of income distribution and other equity issues, and 5) more emphasis needed on practical aspects of primary data collection and analysis, project evaluation, agricultural planning, policy analysis, and public administration.

The research and literature so far is not directly related to graduate agricultural economics programs' content and objectives. Since programs' content has not been studied fully the problem of programs' quality cannot be solved. Yet, a rather large amount of investigative and teaching work is concerned with questions of private efficiency or profit rather than public welfare or social economics (Witt in Tweeten 1988). Less mathematics and more logic apparently need to be the watchword at the present moment (Black 1928). The profession currently may be "mesmerized by its ability to work with quantitative techniques and the flirtation with these techniques may have caused a loss of sight of some important issues now facing U.S. farms and the broader agricultural industry" (Barkley 1984, p. 798).

We would like to state unequivocally that today no set of competencies, experiences, and content knowledge is commonly accepted as the core of any well designed program of graduate study for future agricultural economists. There is no agreement on what should be taught. While we hope there is never any agreement on competencies, there certainly should be agreement on experiences and content knowledge.

The Conceptual Agricultural Economics Master's Degree Program Model

A number of curricular models focus on the student and/or the society; usually these models suggest the content knowledge and some teaching objectives. Knowledge of the subject matter and the approach to teaching have been virtually ignored in the literature on agricultural economics departments' effectiveness. This is a serious omission because the effectiveness of agricultural economics departments and related teaching content knowledge are inextricably related.

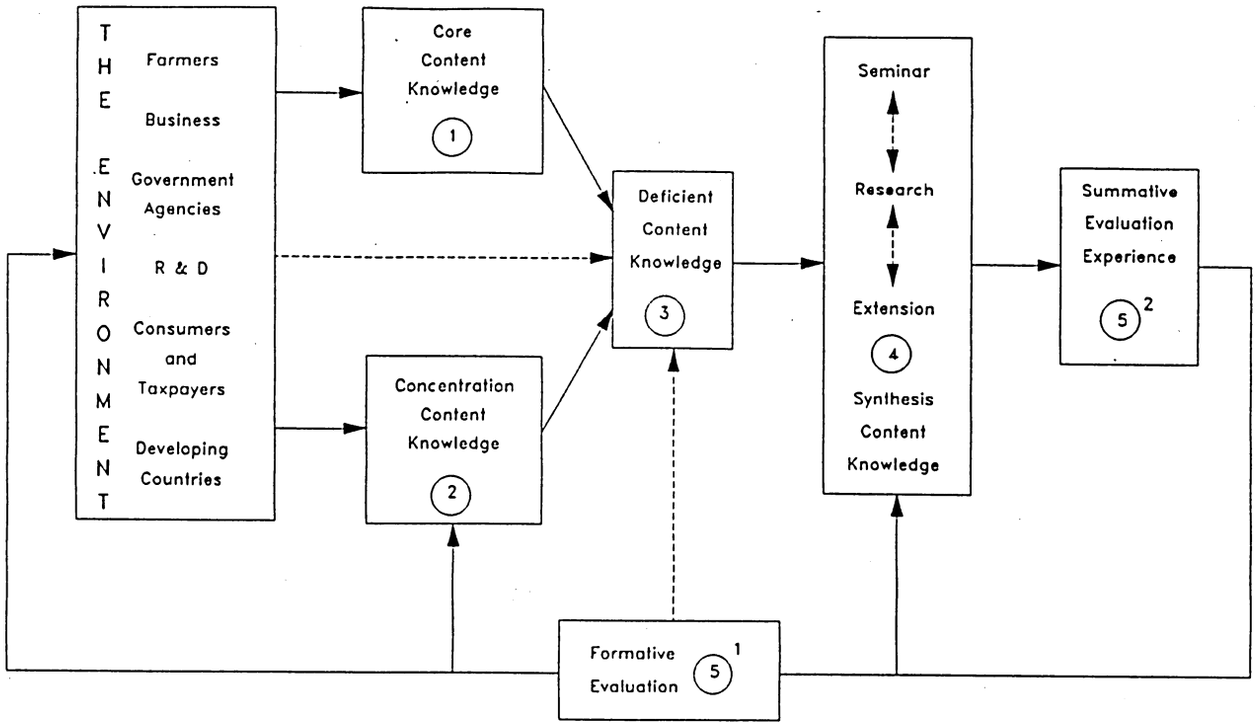
Shulman (1986) refers to the absence of focus on subject matter as the "missing paradigm". This paradigm describes three categories of content knowledge: core content knowledge, pedagogical content knowledge, and curriculum content knowledge. In

addition, the graduate program experience is considered to create skills and impart knowledge required for 1) competence in general economics and quantitative methods, 2) problem solving (PS), subject matter (SM) and disciplinary (DISC) research, 3) teaching, and for 4) administrative work in universities and institutes, governments, international agencies and private businesses, agricultural development planning, and extension work (Johnson 1983).

The overriding issue in the literature on agricultural economics degrees is the dilemma between theory and practice: how to balance the need for practical knowledge and training in a skill with theoretical framework of the field of study (Glazer 1986). If the areas of activities of agricultural economics departments are considered to be teaching, basic research, and applied research/extension, then, according to Beilock and Polopolus (1988), the goals will be as follows: 1) to prepare individuals for useful roles in society (for teaching), 2) to develop new knowledge (for basic research), and 3) to enhance social and economic welfare (for applied research/extension).

The program should be comprised of five strands or content areas. Just how these content areas are handled could well vary from university to university since the thrust of each content area can be realized in many different ways. For illustrative purposes the agricultural economics departments' content knowledge areas are considered to be the following: 1) the core content knowledge area, which has an intellectual and value basis which is found in agricultural economics, 2) the concentration content knowledge area, which allows graduates to acquire technical knowledge, 3) the deficient content knowledge area, which allows students to make up for some areas in which they are deficient, 4) the synthesis (practicum) content area, which gives students opportunity to be involved in supervised practice, and 5) the evaluation content area which gives students opportunity to demonstrate their competence in agricultural economics. These strands or content areas are the major blocks of our benchmark model presented in an open system form in Figure 1. With the exception of the last content area (strand), that is, demonstration of competence (evaluative content area), all can be taken concurrently since the content areas are not conceived as sequential. Courses within each strand, however, should be sequential. Some of the relevant courses might well be taken in other schools in the university, or professors from other departments might be induced to teach in the department of agricultural economics.

Figure 1. Open Model of Curriculum Content Knowledge in Agricultural Economics Master's Degree Program



The idea of the open systems model has been used in many fields of study. Some of these fields of study are evaluation (Stake 1975), politics (Almond and Powell 1978), administrative theory (Guba 1957, Parson 1956), policy making (Dror 1968, Dye 1978, Dunn 1981, Anderson 1975), planning (Jantsch 1975), and organizational effectiveness (Mott 1972, Steers 1977). According to Katz and Kahn (1978), an open systems theory emphasizes the close relationship between a structure and its supporting environment, otherwise it is closed.

The agricultural economics curriculum is closed if it includes only the traditional core and specialization courses, whose main purpose is mastery of a substantial common body of knowledge (Thornton and Innes 1988). In this case the knowledge required will include competence in general economics theory, quantitative methods, and agricultural economic

policy (Johnson 1983). Over time, these content areas are static since there is no feedback to induce curriculum changes as dictated by farmers, business, government agencies, R & D, consumers, taxpayers, and the less developed countries' needs.

There are several ways of opening up such a closed agricultural economics program. First, the curriculum can be expanded to include courses that put agricultural problems in the context of the welfare of society and international community as a whole. Second, during the training process students can be given the opportunity to apply economic theory and quantitative methods to a specific area of study in an extension, research or internship program. Third, students can be allowed to enrich their experience by taking courses outside the agricultural economics departments; courses which are relevant to agricultural economic theory and practice. The relevant courses are those that give a different theoretical perspective of economic phenomena. Some of these courses are the following: Marxian economics, political economy, institutional economics, political science, psychology, philosophy, sociology and education. Fourth, periodically review the programs in response to changes in technology, consumer demand and new research knowledge. The discussion of each content area in our model is given below, in proposition form.

Components of the Prescriptive Curriculum Content Knowledge in Agricultural Economics Master's Degree Program

1. Agricultural economics departments should offer common core content knowledge in the following areas: micro-and macro-economics, quantitative methods, public and agricultural economic policy. The selected general objectives of this offering are the following: 1) to grasp and apply the basic fundamental concepts in economic theory, 2) to enable students to acquire knowledge and later apply statistics, structural econometrics, operations research, and models to make inferences and estimations (Zellner 1985), 3) to enable students to formulate statements of economic, political, social, and agricultural intentions, and 4) to make students conscious of the limits of neoclassical analysis by exposing them to alternative theories such as Marxian economics (Petit 1981).
2. Agricultural economics departments should allow graduate students to specialize or concentrate in area(s) of selected content knowledge. Some of the suggested specializations are the following: resource economics, agricultural policy, production economics, agricultural trade, agricultural marketing, agricultural finance, labour economics, agricultural business and management, rural development, consumption

economics, welfare economics, and development economics. The major objectives of the specialist content knowledge are the following: 1) to prepare individual experts in specific areas of specialization so that they can directly play a relevant and useful role in society (Beilock and Polopolus 1988) and 2) to provide students with needed labour market skills (Glazer 1986).

3. Agricultural economics departments should allow students to make up for specific deficient content knowledge and skill areas. The deficient areas may include the following: mathematics, statistics, computer science, foreign language, agricultural behaviour, natural and social sciences, and some content areas in proposition 2 taken at advanced levels. The main objectives of the deficient content area are the following: 1) to allow students to broaden their agricultural economics curriculum and 2) to provide students with needed extra skills or makeup for deficiencies in some content knowledge (Glazer 1986).
4. Agricultural economics departments should offer the students opportunity to synthesize the programs' content knowledge. The activities that are suggested include the following: participating in seminars, conducting research, working in extension projects or internships with government agencies, farmers, business and libraries. The objectives of the synthesis content area are the following: 1) to translate theory into practice (Glazer 1986), 2) to develop new agricultural economics knowledge, 3) to enhance cooperative ventures with government agencies, farmers and business (Johnson 1983), and 4) to enhance social and economic welfare (Beilock and Polopolus 1988).
5. Agricultural economics departments should judge students' competency by use of both formative and summative evaluation experiences. The following evaluation instruments are suggested: continuous course assessment, that is, tests, essays, classroom participation, performance in practicals, oral defence ideas, essays, end of research thesis and comprehensive end of course examination. The objectives of summative and formative experiences are: 1) to judge students' achievement and performance and 2) to improve curriculum practice in agricultural economics learning and teaching.

Data and Procedures

The study used secondary data. The most recent (1987-88 and 1988-89) graduate programs' calendars and handbooks of fourteen agricultural economics departments were reviewed to determine the structure and requirements of their agricultural economics Master's curriculum program content.

All the departments studied have a curricular framework similar to our proposed model. Master's students must satisfy some admission prerequisites and complete a set of required courses, a number of elective courses in one or more subfields, and a research project.

Although programs in Canada and the United States are quite similar, the philosophies underlying the agricultural economics Master's programs in the two countries are somewhat different, especially with respect to the Master's research requirement. In both Canada and the United States the objective of agricultural economics departments is to train and produce professionals as inputs for the public and private sectors. The U.S. schools of agricultural economics have mature and established Ph.D. programs which influence their Master's degree programs.

Fourteen North American universities were studied. The main impetus of this research was to compare the whole population of seven Canadian departments with a sample of selected U.S. departments which offer a Master's program in agricultural economics. The seven Canadian universities were as follows: Alberta, British Columbia, Guelph, Laval, Manitoba, McGill, and Saskatchewan. The selected U.S. universities were the following: California Davis, Illinois, Iowa State, Maryland, Minnesota, Purdue, and Texas A & M.

The criteria for selecting the seven U.S. schools were fourfold: 1) they generally have well established graduate programs in agricultural economics, 2) it is perceived that these schools are typically among those offering quality graduate programs in North America, 3) they provide a good geographic cross section of the best agricultural economics graduate programs, and 4) the U.S. sample size was chosen to equal the Canadian population size to facilitate statistical manipulations.

The condition of the course contents of the fourteen agricultural economics departments will be analyzed and compared below with the propositions of our model. Then, an attempt will be made to give several recommendations designed to improve the curriculum condition.

Model Application

Core Content Knowledge (CCK) or Required and Admission Prerequisites Courses (RPC)

Every profession has a core of technical knowledge which must be possessed by its practitioners. Agricultural economics is no exception. It too has a core of technical knowledge with which the agricultural economists must be familiar (but not necessarily master).

Table 1 shows the university departments by country, which either offer or require a core by level or field of specialization. The predominant compulsory courses were found to be the following: 1) microeconomics, 2) macroeconomics, 3) quantitative methods, 4) production economics, and 5) agricultural policy.

The rank ordering of core content knowledge or required courses by total number of university departments (out of the fourteen) at Master's level is as follows: 1) microeconomics (13), 2) macroeconomics (9), 3) quantitative methods (12), 4) production economics (4), and 5) agricultural policy (3).

Six Canadian universities require microeconomics. Four of these universities, namely British Columbia, Laval, Manitoba, and McGill indicate a microeconomics course at an advanced level is a requirement as part of the core. At McGill, students in the Master of Science degree in agricultural economics are required to take six credits in either microeconomics or macroeconomics. Microeconomics is not part of the required courses at Saskatchewan but an entrance requirement as part of economic theory. Although the University of Alberta calendar indicates a requirement of intermediate and advanced microeconomics and the University of Guelph specifies it as advanced, the mentioned equivalent courses are all undergraduate economics courses. Alberta, however, supplements this minimum requirement with an advanced course in microeconomics application.

Table 1. Required Courses in Master's Programs by Country and University

	CANADA								UNITED STATES								
	U. of Alberta	U. of B.C.	U. of Guelph	Laval	U. of Man.	McGill	U. of Sask.	Total Canada	U.C. Davis	U. of Ill.	Iowa State	U. of Maryland	U. of Minn.	Purdue	Texas A&M	Total U.S.	Total Can. & U.S.
Microeconomics																	
Intermediate	X		X					2					X			1	3
Advanced		X		X	X	X		4	X	X	X	X		X	X	6	10
Not Required							X	1								0	1
Macroeconomics																	
Intermediate	X		X					2					X			1	3
Advanced					X	X		2		X	X			X	X	4	6
Not Required		X		X			X	3	X			X				2	5
Quantitative Methods																	
Econometrics	X						X	2	X		X		X		X	4	6
Operations Research								0	X			X				2	2
Not Specified			X		X	X		3		X				X		2	5
Not Required		X		X				2								0	2
Prod. Economics		X			X		X	3							X	1	4
Agric. Policy					X			1						X	X	2	3

Notes:

1. The table includes courses required by a total of two or more departments.
2. Source: university calendars and graduate handbooks.

Macroeconomics is a requirement in four Canadian universities. However, only two universities, Manitoba and McGill, specify the course to be a requirement at an advanced level while Alberta and Guelph require it at undergraduate levels. Five Canadian universities state a requirement in quantitative methods. These universities are Alberta (econometrics), Guelph (chosen from mathematical programming, statistics, and econometrics), Manitoba (chosen from econometrics, applied optimization, and forecasting and simulation models), Saskatchewan (econometrics for agricultural economists), and McGill (one of quantitative methods, modelling methods, management statistics, econometric methods in management, and statistical methods).

Production economics which appears to be required by a total of three universities was not in our core content knowledge model propositions because it was thought that microeconomics takes care of production. In Canada, this course is offered under the core program by British Columbia, Manitoba, and Saskatchewan. It would seem that these universities require production economics in their cores to supplement or substitute for microeconomics. Only one Canadian university, Manitoba, offers a course in agricultural policy under the core or required courses strand. Manitoba requires, in addition, a course in marketing while British Columbia requires a course in agricultural price theory.

Like their Canadian counterparts, all seven U.S. universities require courses in microeconomics. Six agricultural economics departments indicate advanced microeconomics in the minimum requirements for a Master's degree. Only one department, Minnesota, requires it at intermediate level. Macroeconomics is a required course in five U.S. universities. Illinois, Iowa State, Purdue, and Texas A & M indicate an advanced level macroeconomics mastery requirement while Minnesota requires intermediate level mastery of macroeconomics. Maryland requires admission applicants for a Master's degree to have a knowledge of intermediate macroeconomics theory and policy. California-Davis does not require it at all.

All seven U.S. universities have a course requirement related to quantitative methods. A typical core program at California-Davis includes applied linear programming and applied econometrics. Graduate students in agricultural economics at Iowa are required to place major emphasis on studies in one or more subject matter areas which include quantitative and research methods. Minnesota and Texas A & M have a course in statistical analysis in the core requirements.

Production economics is a core course for both thesis option and non-thesis option students of Texas A & M. In addition, this university requires two courses in marketing and price analysis. Two U.S. universities, Purdue and Texas A & M, require their students to take a course in agricultural policy. The agricultural policy course at Texas A & M is, however, a requirement for students taking the M.S. non-thesis option.

Several conclusions can be derived from the above analysis. The main stream of required courses in agricultural economics are those that impart knowledge for competence in general economic theories and quantitative methods. The contents of these core courses appear to be dinegrated as descriptive (Johnson 1983, p. 1142). They portray the following characteristics: 1) they are more theoretical or analytic, 2) they show more of an economic bias and therefore appear to be a continuation of undergraduate economics programs, 3) they show inadequate treatment of history of economic thought and agricultural policy.

Overall, thirteen universities require microeconomics and only nine require macroeconomics. Quantitative method courses are required by all except two Canadian universities. Few departments teach agricultural policy in the core requirements. It is impossible to consider agricultural economics as a pure science. Therefore, in order for graduates to appreciate and understand the effects of agricultural programs on income distribution, their analysis will have to be extended beyond market phenomena. Graduates who do not take agricultural policy miss the opportunity to examine agricultural policies in their country with respect to economic development and growth. In addition, they do not examine politics in agriculture from an economic viewpoint.

A common feature in Canadian and U.S. universities is the encouragement of agricultural economics students to take the required theory courses from other departments and schools at the university. This practice allows the departments and universities to utilize their resources and capacities efficiently. However, the negative consequences of this practice must also be mentioned, that is, although such outside departments may offer substantial competence and mastery of core content in economic theory, mathematical economics, etc., the practical value of which may be limited because the specific objectives of teaching these courses in the outside departments may be different from those expected in the agricultural economics departments.

Specialization Content Knowledge (SCK)

Table 2 shows the areas of concentration available to Master's degree students given by all fourteen departments. The concentrations frequently offered are agricultural

marketing (offered by fourteen departments), agricultural development, agricultural policy, agricultural trade, production economics, quantitative methods, and resource/environment economics (all six offered by thirteen departments), agricultural finance and regional/rural development (both offered by twelve departments), and agribusiness/farm management (offered by eleven departments).

These findings would tend to agree with those by Storey and Christensen (1973) who found that, in a sample of forty-six departments, courses added to their agricultural economics graduate curricula in the last five years were as follows: quantitative methods (34), resource economics (27), economic development (16), economic theory (15), world agriculture and trade (12), regional development (12), agricultural marketing (12), and agricultural policy (8). However, they would also indicate that over time the discipline of agricultural economics has become much more specialized, diversified and mission oriented as some areas which were previously offered by a small number of departments, for example, agricultural policy or agricultural marketing, are now available in almost all the departments.

Table 2 also indicates a welcome development in the direction of the discipline of agricultural economics. Some universities are gradually introducing courses in, among others, welfare economics and income distribution, consumer economics, and labor economics. Courses of this nature would further enable graduate students to put agricultural economic problems into perspective and synthesize the economic system as a whole.

Table 2. Areas of Concentration by Country and University

	CANADA								UNITED STATES								
	U. of Alberta	U. of B.C.	U. of Guelph	Laval	U. of Man.	McGill	U. of Sask.	Total Canada	U.C. Davis	U. of Ill.	Iowa State	U. of Maryland	U. of Minn.	Purdue	Texas A&M	Total U.S.	Total Can. & U.S.
Agric. Marketing	X	X	X	X	X	X	X	7	X	X	X	X	X	X	X	7	14
Agric. Development	X		X	X	X	X	X	6	X	X	X	X	X	X	X	7	13
Agric. Policy	X		X	X	X	X	X	6	X	X	X	X	X	X	X	7	13
Agric. Trade	X	X	X	X	X	X	X	7	X	X	X	X	X	X		6	13
Production Economics	X	X	X	X	X		X	6	X	X	X	X	X	X	X	7	13
Quantitative Methods	X		X	X	X	X	X	6	X	X	X	X	X	X	X	7	13
Resource/Environ. Economics	X		X	X	X	X	X	6	X	X	X	X	X	X	X	7	13
Agric. Finance	X		X	X	X	X		5	X	X	X	X	X	X	X	7	12
Regional/Rural Development	X	X	X	X	X			5	X	X	X	X	X	X	X	7	12
Agribusiness/Farm Management	X	X	X	X	X	X		6		X	X		X	X	X	5	11
Applied Welfare Economics							X	1				X	X	X	X	4	5
Consumer/Consump. Economics			X					1	X				X		X	3	4
Labor Economics		X						1	X		X					2	3

Notes:

1. Only broad areas of concentration are recorded.
2. Areas of concentration offered by a total of one or two departments are not recorded.
3. Source: university calendars and graduate handbooks.

It is important to note that Table 2 reports only broad areas of specialization. However, some universities offer subareas, as well. In Manitoba, for instance, agricultural marketing includes four other courses in attributes of market organization, agricultural market regulation, research in agricultural marketing, and transportation economics and research. In Texas A & M, four courses in agricultural market organization and structure, market development research theory, agricultural market and price analysis, and agricultural consumption analysis are all offered as subareas of agricultural marketing. Although not reported in Table 2, it would generally appear that U.S. schools offer more subareas of concentration within their departments than their Canadian counterparts. This may be an indication that U.S. agricultural economics departments have more resources than their counterparts in Canada. Unless Canadian students utilize concentrations offered by other departments and schools, U.S. agricultural economics departments would seem to offer their students a wider choice of concentrations than that offered by Canadian agricultural economics departments.

Deficient Content Knowledge (DCK)

Our model includes a deficient content knowledge strand. The purpose of this deficient content knowledge area is to allow graduate students to make up for specific deficient knowledge and skills. Most departments in both Canada and the United States require applicants lacking in some admission requirements but otherwise considered admissible to graduate studies to register as qualifying students during which time they must complete the equivalent of the prescribed theory and other courses.

The Master's program in agricultural economics caters to a spectrum of students with different academic and cultural backgrounds. Some of these students are very strong academically in agriculture and weak in economics, while others are academically strong in economics and weak in agriculture and others may be strong in agricultural economics. It would be unwise therefore to recommend a common deficient content knowledge package for all these groups. Yet some students, depending upon their interest, experience, and academic standing, may need to take remedial courses such as management, marketing, policy analysis, computer science, language, Marxian economics, political economy or institutional economics. In both countries, most programs we reviewed did not seem to recognize these individual differences and needs.

Particularly with respect to the question of training foreign students in the U.S., Fienup and Riley (1980) showed that the areas in which these students feel deficient on admission and therefore would need further grounding are the following: 1) practical statistical and econometric methods, 2) computer programming, 3) agricultural sector analysis and project planning, and 4) management and public administration courses. Since the project approach and its emphasis on efficiency to development of most LDC's has been dominant in these countries, there is, among the alumni from these countries, a perceived need for additional knowledge in welfare economics, comparative economic system, and income distribution.

Synthesis (Practicum) Content Knowledge (PCK)

Agricultural economics students have to be involved in supervised practice. This area could indeed well be the most critical phase of the agricultural economics student preparation. Our model indicated four areas that could be used to synthesize the core, specialization, and deficient content knowledge. These areas are as follows: research project, thesis, seminar or teaching, and extension or internship.

Table 3 lists the research requirements for Master's degree students in the Canadian and U.S. universities. All fourteen departments require students to complete a research project. The three departments that have a thesis only requirement are as follows: British Columbia, McGill, and Illinois. The departments that have both thesis and non-thesis options are as follows: Alberta, Guelph, Laval, Manitoba, Saskatchewan, California-Davis, Iowa State, Maryland, Minnesota, Purdue, and Texas A & M.

The research project is the one content area where there is a marked difference between Canadian and U.S. agricultural economics departments. The thesis project option appears to be more common in Canada than in the United States. This finding indicates a dichotomy in thinking between the two countries' professions about the value of the Master's degree thesis (Storey and Christensen 1973).

Table 3. Research Requirements by Country and University

	CANADA								UNITED STATES								
	U. of Alberta	U. of B.C.	U. of Guelph	Laval	U. of Man.	McGill	U. of Sask.	Total Canada	U.C. Davis	U. of Ill.	Iowa State	U. of Maryland	U. of Minn.	Purdue	Texas A&M	Total U.S.	Total Can. & U.S.
Thesis- Only Option		X				X		2		X						1	3
Non-thesis and Thesis Options	X		X	X	X		X	5	X		X	X	X	X	X	6	11
Course or Seminar in Research Methods				X	X		X	3				X	X		X	3	6

Notes:

1. A non-thesis option usually requires more hours of course work than the thesis option.
2. Source: university calendars and graduate handbooks.

Six departments require students to take a course or seminar in research methods. Some departments which offer a non-thesis route also require a course or seminar in research methods. Training in extension activities is not required by most of the departments studied. The University of Guelph has an interesting program. Normally each candidate is required to have one or two semesters of internship during the program. Students register in special projects courses and a technical report on each of the two semesters is required in fulfillment of these courses. In certain circumstances, with candidates who have had extensive work experience, the internship requirements may be modified to suit the professional needs of the student as determined by the supervisory committee. According to Storey and Christensen (1973), there were very few departments where a significant portion of students receive teaching experience. A "very small proportion of students in agricultural economics receive extension experience as part of their graduate training" (p. 63). It would generally seem that in both Canada and the United States these deficiences still persist.

Evaluation (Demonstration of Competence) Experiences (EE)

The common procedure of evaluating student performance in most of the agricultural economics departments is by use of the comprehensive examination and/or by oral defence of thesis. There are minor differences in emphasis and procedures.

The University of British Columbia reviews the progress of graduate students by use of an end of year examination to decide their continuation in the program. At least 60% must be obtained in any course taken in a Master's program for a student to be granted pass standing. Only three units of pass standing may be credited towards a Master's program; for all other courses credited to the program, at least 65% must be obtained. Students who fail a course may sometimes be allowed to continue but their status will be changed to provisional. Students who fail two courses in any semester are asked to withdraw.

An evaluation committee of three faculty members, including one from another department, must be recommended by the Department and approved by the Faculty at the University of Alberta. The committee reviews the project report and conducts an oral examinaton to test the candidate's knowledge of his areas of emphasis and related fields. The committee is responsible for the maintenance of Faculty and Department "standards" for the project.

At the University of Guelph the supervisory committee is responsible for administering the student's written comprehensive examination and the oral examination. All students in the non-thesis program are required to take and successfully pass one comprehensive written and one comprehensive oral examination at the conclusion of their course work program. Students who fail the written exam are allowed to repeat it once.

Upon successful completion of the written examination at the University of Manitoba, the student may proceed to the oral examination. The written examination and the essays constitute one area on which the student should expect to be examined at the oral.

In all seven Canadian universities, the thesis work is usually evaluated by both internal and external examiners. Candidates are required to orally present and defend the thesis before the committee except at McGill where the candidate defends the thesis before the academic staff in the agricultural economics department and other guests as may be invited by the student's thesis supervisor.

At Illinois, if the Master's thesis is waived, the student advisory committee will conduct a comprehensive examination covering the students course program in order to determine qualification for the Master's degree. The University of Minnesota has no written comprehensive examination. The oral examination may be based on coursework and the research component of the program.

The final examination at Texas A & M is taken once students have completed all other requirements for the degree and covers both their course work and thesis. At California Davis, the M.S. degree requires 36 quarter units of upper division and graduate courses, and a comprehensive oral examination. Students opting for a thesis option may be required to present and defend the thesis in an oral examination as well.

In both Canada and the United States the evaluation procedures used by the departments of agricultural economics appear to serve academic and administrative purposes. The purpose of these administrative instruments is to judge and qualify students' final performance since they are administered at the end of the program.

The purpose of including the evaluation strand in our model was to allow for a feedback loop into the agricultural program so that on the basis of continuous evaluation the weaknesses in the program and students' learning and teaching can be identified and improvement made. However, as the previous observations indicate, most universities are concerned with students final judgement rather than with improvement in practice, teaching, learning, and extension.

Our findings and conclusions on this part of the study tend to suggest that the objectives of the evaluation exercises in the departments have not changed from those observed by Storey and Christensen (1973) some sixteen years ago. At that time the objectives of administering examinations were stated by the departments as the following: "1) to test the student's knowledge (chiefly theory and quantitative methods), 2) to test the student's ability to apply knowledge to problems, 3) to test the student's general competence or ability, and 4) to test his ability to continue in dissertation research" (p. 62). These objectives suggest that the purpose of student testing is final judgement rather than curriculum monitoring.

General Comments on Program Objectives

Generally, all departments appear to be weak in stating the specific objectives of teaching the required program courses. Most departments except McGill give the program structure or the course contents of what they offer. They do not state or show why they offer the program. The answer to the question of why agricultural economics departments require macroeconomics, microeconomics, quantitative methods, production or agricultural policy in the core program is as important as what to teach.

Program monitoring and evaluation are easier if the objectives are stated clearly and specifically. By looking at the universities' calendars, there appeared to be a relationship between the level of clarity of the stated program goals and objectives and the extent of specialization in the programs structures and their relevancy.

For example, one of the departments which stated clear objectives was McGill. One of the specific objectives of McGill's agricultural economics specialization content area was stated as follows: " ... to provide graduate training in the applied discipline of agricultural economics including agricultural marketing and trade, agricultural policy, agribusiness management, agricultural development, and resource economics". The corresponding specializations for McGill were given as: agricultural food and resource policy, agribusiness management, agricultural commodity trading, and agricultural economics research methods.

The University of Maryland handbook of policies begins with the objectives of the graduate program. Our impression was that the clarity of the curriculum content shown in the Maryland handbook was a result of well stated objectives. According to the handbook, the graduate program of the Department of Agricultural and Resource Economics at Maryland is designed to "prepare students for a career as a professional economist, in the

private, academic or government sectors". Experience and training are provided by means of "(1) courses within traditional subject matter areas as well as on the frontiers of knowledge in the field, (2) seminars and discussions designed to sharpen the student's ability to express ideas on subjects in the field of agricultural and resource economics and related areas, and (3) research experiences designed to develop competency in applications of economic theory and the use of quantitative methods".

Storey and Christensen (1973) had also found that a fairly large number of administrators of graduate programs in agricultural economics apparently find it difficult to articulate the objectives of their programs. In their study "about one fifth of the respondents either did not answer the question on objectives or referred to attached handbooks of policy statements which often did not contain any useful statements about program objectives" (p. 61). In fact, as pointed out by Glazer (1986), confusion in stating clear objectives of the Master's program may stem from attempts to provide general education, prepare doctoral candidates, and provide quasi vocational guidance. By the same token, "the Master's degree as a 'useful credential' implies measuring outcomes through career goals, employment, and self-fulfillment" (p. 32). Certainly this weakness in articulating program objectives raises significant doubts about the ability of the departments to assess the quality of Master's degrees.

Recommendations

It would be unwise to consider our findings conclusive given the fact that the major sources of data, the university calendars and graduate handbooks, may not be reliable. Some departments may be doing a better or worse job than that shown in their calendars and handbooks. Generally speaking, both Canadian and U.S. agricultural economics Master's degree programs measure up against our benchmark model very well. Having said this, however, our findings suggest that the programs are deficient in some content areas of the postulated model. The major deficiencies are the following: 1) unclear statements of program objectives, 2) inadequate treatment of economic theory, especially macroeconomics, 3) few departments offer courses in policy as part of their core area, 4) absence of deficient content area, 5) overuse of thesis in Canada to produce research skills rather than the use of non-thesis option to produce corporate economist skills, and 6) no provisions for program formative evaluation but final judgement. In this regard the following recommendations are in order:

1. Certainly the Master's degree curriculum in agricultural economics embodies theoretical understanding as well as technical expertise. However, before curriculum content and design are addressed carefully, departments ought to ask themselves why they are offering the programs by stating the objectives. Otherwise, the Masters' degree curricula will merely be a collection of courses whose quality cannot be monitored or improved.

2. The Master's degree in agricultural economics is a graduate program and this ought to be reflected in the types and levels of core courses offered. These courses, especially microeconomics and macroeconomics, do not have to be highly mathematical. They should, however, offer something new and beyond the level of undergraduate economics requirements. These courses could be designed somewhere between the senior undergraduate and Ph.D. levels. Furthermore, all universities in the two countries should consider making microeconomics and macroeconomics required courses for both thesis and non-thesis Master's programs.

3. The core content area will continue to be dominated by the orthodox offerings, namely, microeconomics, macroeconomics, and quantitative methods. However, given the fact that a substantial number of graduates will be involved in the politics of resource allocation, decision making, and production, a course in policy could be offered as part of the core content area while production could be offered as one of the specialization content area courses.

4. The agricultural economics departments in the United States would appear to be more flexible and diversified with the specialization offerings in non-traditional areas than the Canadian counterparts. Canadian schools could in this case consider the utilization of courses offered by other departments and schools. This is especially true for the deficient content area since students' interests and employment prospects will certainly override other reasons for selecting a particular course of study.

5. Most Canadian universities offer both thesis and non-thesis routes. However, it would appear that the former is the route most often used. This route is time-consuming and although it provides training in analytical and research skills, it may not be the optimal route to produce corporate agricultural economists or government agencies' administrators. Given that most Canadian universities do not have well-established Ph.D. programs, we would suggest that these universities consider introducing or expanding the non-thesis route.

6. The main purpose of the demonstration of competence content area appeared to be the judgement of students' performance on comprehensive examinations and oral defence of thesis and ideas. If the purpose of demonstration of competence is to improve the programs, then formative evaluation procedures will have to be adopted by the universities.

Concluding Comments

The discipline of agricultural economics is an applied area of the broader discipline of economics. It is applied in the sense of being problem solving or mission oriented, the focus being on applying or adapting economic theory to resource utilization in agriculture. It is also applied in its emphasis on the relevance of economics problems and solutions to public policy determination. We have assumed that the missions of the departments are reflected in their calendars and handbooks and that departments practise what they preach in these calendars and handbooks. The situation may be different. They may do better or worse in actuality. Our benchmark model is not a panacea, however. If we broaden our focus and redirect our efforts along the lines suggested in this study, we could have significantly improved agricultural economics programs embodying the various components of the curriculum content knowledge. An interesting avenue for further research in this important area is the application of our model to the Ph.D. programs in these departments, perhaps with the use of primary data to supplement the calendars.

References

Almond, G.A. And G.B. Powell. *Comparative Politics: a Developmental Approach.* Boston: Little Brown, 1978.

Anderson, J.E. *Public Policy Making.* New York: Praeger, 1975.

Barkley, P.W. "Rethinking the Mainstream". *Amer. J. Agr. Econ.* 66 (1984): 798-801

Beilock, R.P., And L.C. Polopolus. "Ranking of Agricultural Economics Departments: Influence of Regional Journals, Joint Authorship, and Self-Citations". *Amer. J. Agr. Econ.* 70 (1988): 403-409.

Beilock, R.P., L.C. Polopolus, and M. Correal. "Ranking of Agricultural Economics Departments by Citations". *Amer. J. Agr. Econ.* 68 (1986): 595-604.

Bishop, C.E. "The Urbanization of Rural America: Implications for Agricultural Economists". *J. Farm Econ.* 49 (1967): 999-1008.

Black, J.D. "Research in the Prices of Farm Products" *J. Farm Econ.* 10 (1928): 66.

Colander, D. And A. Klamer. "The Making of an Economist". *J. Econ. Perspectives* 1 (1987): 95-111.

Dror, Y. *Public Policymaking Re-examined.* San Francisco: Chandler, 1968.

Dunn, W. *Public Policy Analysis.* Englewood Cliffs: Prentice-Hall, 1981.

Dye, T.R. *Understanding Public Policy.* Englewood Cliffs: Prentice-Hall, 1978.

Fienup, D.F. And H.M. Riley. *Training Agricultural Economists for work in International Development.* American Agricultural Economics Association (AAEA), 1980.

Glazer, J.S. *The Master's Degree: Tradition, Diversity, Innovation.* Washington: Association for the Study of Higher Education, 1986.

Guba, E.G. *Administrative Relationships. A Study of the School as a Social Institution.* Chicago: University of Chicago Press, 1957.

Holland, D. And J. Redman. "Institutional Affiliation of Authors of Contributions to the American Journal of Agricultural Economics, 1953-72". *Amer. J. Agr. Econ.* 56 (1974): 784-90.

Jantsch, E. *Design for Evolution: Self-Organization and Planning in the Life of Human Systems.* George Braziller: New York, 1975.

Johnson, G.L. "The Relevance of U.S. Graduate Curricula in Agricultural Economics for the Training of Foreign Students". *Amer. J. Agr. Econ.* 65 (1983): 1142-48.

_____. *Research Methodology for Economists*. New York: McMillan, 1986.

Katz, D. And R.L. Kahn. *The Social Psychology of Organizations.* New York: John Wiley, 1978.

Klemkosky, R.C. And D.L. Tuttle. "A Ranking of Doctoral Programs by Financial Research Contributions of Graduates". *J. Quantitative Financial Analysis* 12 (1977): 491-497.

McCloskey, D.N. "The Rhetoric of Economics". *J. Econ. Literature* 21 (1983): 481-517.

Mott, P. *The Characteristics of Effective Organizations.* New York: Harper and Row, 1972.

Opaluch, J. And R.E. Just. "Institutional Affiliation of Authors of Contributions in Agricultural Economics, 1968-72". *Amer. J. Agr. Econ.* 59 (1977): 400-403.

Parson, T. "Suggestions for Sociological Approach to the Theory of Organizations". *Administrative Science Quarterly* 1 (1956): 224-239.

Petit, M. "Teaching Marxist Economics to Agricultural Economics students in Non-Marxist Countries". *Rural Change: The Challenge for Agricultural Economists,* eds. G. Johnson and A. Morunder. Montclair: Allanheld, Osmun & Co., 1981.

Provus, N.M. "Evaluation of On-going Programs in the School System". *Educational Evaluation Theory and Practice,* eds. B.R. Worthern and R.R. Sanders. Washington: Charles A. Jones, 1973.

Shulman, L. "Those Who Understand: Knowledge Growth in Teaching". *Educational Researcher* 15 (1986): 4-14.

Siegfried, J.J. "The Publishing of Economic Papers and Its Impact on Graduate Faculty Ratings, 1960 - 1969". *J. Econ. Literature* 10 (1972): 31-49.

Simpson, J.R. And J.T. Steele. "Institutional Affiliation of Contributors to the American Journal of Agr. Econ." *Amer. J. Agr. Econ.* 67 (1985): 325-327.

Stake, R.E. *Evaluating the Arts in Education*. Columbus, Ohio: Merril, 1975.

Steers, R.M. *Organizational Effectiveness: A Behavioural View*. Santa Monica: Good Year 1977.

Storey, D.A. And R.L. Christensen. "Graduate Programs in Agricultural Economics: Results of a Survey". *Amer. J. Agr. Econ.* 55 (1973): 61-64.

Tauer, L.W. And J.R. Tauer. "Ranking Doctoral Programs by Journal Contributions of Recent Graduates". *Amer. J. Agr. Econ.* 66 (1984): 170-172.

Thornton, R.J. And J.T. Innes. "The Status of Master's Programs in Economics". *J. Econ. Perspectives* 2 (1988): 171-178.

Tweeten, L. "Domestic Food and Agricultural Policy Research Directions". *Agriculture and Rural Areas Approaching the Twenty-first Century.* eds. R.J. Hildreth, K.L Lipton, K.C. Clayton, and C.C. O'Connor. Ames: Iowa State University Press, 1988.

Waelti, J.J. "*The Making of African Agricultural Economists: American Responsibilities*" Department of Agricultural Economics, University of Minnesota. Staff Paper P88-46, 1988.

Zellner, A. "Bayesian Econometrics". *Econometrica* 53 (1985): 253-69.