

CURRICULAR GENESIS IN AGRICULTURE¹

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In the beginning there was agriculture. And agriculture begot agronomy and horticulture and animal husbandry and rural economy and domestic science, though there is some doubt about the parentage of the latter. Each of these in turn begot a large and diverse family with grandchildren, cousins, and step-children too numerous to mention.

First, a scope note — something the writers of legal articles do for lawyers so the latter can decide if they wish to read right on. This is an imperfect, historical perspective on the evolution, growth, division, subdivision, occurrence, abandonment and recurrence of subjects which have been taught in agriculture: and on some of the many combinations of these subjects, each of which has in turn been considered indispensable to the proper education of a student of agriculture. It is not an institutional comparative study, but rather an attempt to make some useful observations and generalizations based on my experience at the University of Illinois, and bolstered by a modest amount of delving into the University catalogues of the past 100 years.

The Eras of Change

In looking back at the development of our College at the University of Illinois. I detect nine periods in its life. With some changing of dates these periods might characterize other colleges.

The 1860's	Great expectations
1870-1890	Disappointment, criticism, uncertainty and unfulfilled hopes
1890-1905	Resurgence
1905-1915	Building and growth
1915-1925	Amalgamation of teaching, research, extension, teacher training
1925-1940	Questioning midst a changing agriculture and a changing economy. There were some doubts about the "family farm" concept.
1940-1945	Supporting the war effort
1945-1950	Teaching the GI's
1950-1970	Challenge and curricular innovation stemming from such questions as "What is agriculture?", "How do we gear our teaching program to meet the need and take advantage of the opportunity thrust upon us by an increasing international involvement?"

The Beginning

In 1867 a Committee on Courses of Study and Faculty, appointed by the Board of Trustees of the Illinois Industrial University had these things to say about the purpose of the institution and the nature of the educational effort —

"The Industrial College was not an expression of Congressional condemnation of the ordinary college — Congress only sought to extend still wider the benefits of science and liberal culture."

"The college course cannot replace the apprenticeship in the shop or on the farm. Some practice should if possible accompany the scientific study of the several arts, but the aim of this practice must be to insure the thorough comprehension of the principles involved."

"The aims of any institution necessarily control its organization. It should be fitted to its uses."

"In laying the foundations of an institution that is to last through coming ages, and to affect all future generations, we have need to plan wisely. We must not expose ourselves, needlessly, to the inconvenience of changes, nor to suspicions of caprice."

"Nor would we forget nor attempt by a one-sided education to restrain, that free movement and versatility of American life and genius which leads so many of our more eminent citizens to the successive mastery of several vocations. Let us educate for life, as well as for art, leaving genius free to follow its natural attractions, and lending to talent a culture fitting it for all the emergencies of public or private duty. If some of our graduates shall quit, for a time, the harvest field for the forum, or prefer medicine to mechanic art, we shall hope they will demonstrate that, even in professional life, the education we give is neither inferior nor inadequate."

Coming to grips with what would be taught, the committee listed for the agriculture department (it was not a college yet) —

The Course in agriculture proper
The Course in horticulture and landscape gardening
The course in agriculture proper included:

common tillage	veterinary art
arboriculture	agricultural chemistry
fruit growing	rural engineering
cattle and sheep	rural architecture
husbandry	real estate jurisprudence (the "law regulating the tenures and transfers of land the laws relating to rural affairs")

By way of elaboration the Committee also mentioned —

soils	crops
fertilizers	plant physiology
plant breeding	general botany
forestry	fruit growing and propagation
animal anatomy	animal physiology
animal breeding	animal production
animal nutrition	animal training
apiculture	poultry husbandry
food chemistry	entomology
climatology	farm buildings
drainage	fencing
political economy	economics
marketing	agricultural history
foreign agriculture	

To these studies should be added, the Committee said —

mathematics	language
literature	mental philosophy
moral philosophy	logic
history	political science

"The course of instruction in horticulture may comprehend most of the studies already described for agriculture, omitting stock breeding and veterinary art—'" But the Committee did mention —

small fruit culture	culinary vegetables
flowers	hot beds
greenhouses	graperies
nurseries	landscape gardening
the ornamentation of parks, grounds and cemeteries	

Looking at this list I am struck by two things: the completeness of listing what even today would be comprehended as belonging; and the tremendous gaps of knowledge and paucity of any written material bringing together in teachable form even the practical know-how which existed at the time. This was one reason why so many doubted that there was anything really "teachable", in the solid academic sense, falling under the heading of "Agriculture." It was also a reason why so many language, moral philosophy and "cultural" subjects made their way into the curriculum, thus making the debate about what ought to be taught even hotter. Certainly those who argued for practical training and short courses had a point.

This was the picture in 1867. Let us look at what changes resulted after one year of experience. A program had been laid out for each of the four years.

First year	Devoted to the University Farm Layout, soils, drainage, plant culture Related studies — botany inorganic chemistry vegetable physiology English language
Second year	Devoted to the University Farm Soils, fertilizers, climate, implements, road making, fruit culture, animal husbandry, food composition and preparation, related studies — trigonometry surveying geometry topographical drawing vegetable economy chemistry German
Third year	Agricultural Economy Economics, bookkeeping, the branches of agriculture Related studies — geology theoretical agriculture surveying French
Fourth year	Rural Law (This seemed to be a "clean-up" year)

Related subjects –
 animal physiology
 entomology
 literature
 logic
 meteorology
 physical geography
 political economy

In the statements about admission – “Experience shows that students who enter college at a less age than 18 are often injured by being so early thrown into the indiscriminate associations and powerful stimulations of college life. The university is a place for men rather than mere boys;” and the word “campus” had not yet come into use – it was the university “domain.”

On The Defensive

In its report to the Board, the Committee on Courses of Study for the new Illinois Industrial University said: “An industrial university such as we are planning is, in a large part, without precedent or example. The field of its labors is as yet almost untracked in its widest stretches. The very classes for whom its benefits are designed, are as yet not half persuaded of the importance and real value of those benefits. The farmers and mechanics, accustomed to regard higher education as needful and desirable only for professional men, and almost wholly incredulous as to the utility of science in its applications to their work, will look with slow-coming faith upon a university which proposes to make farming a scientific employment, and to lift mechanics into a learned profession.”

In 1870, the year the department became a College of Agriculture, there was inserted in the University catalogue this revealing statement:

“The aim of the College is to educate scientific agriculturists. The frequency with which this aim is misunderstood by the community at large, demands that it shall be fully explained.” Seven years later this statement was modified slightly by omitting “the community at large.” But the statement appeared for 22 years until in 1892 it was replaced by “The aim of the College of Agriculture is to give a liberal and practical education based largely on the natural and physical sciences.” During this same 20 year period there was a hostile segment of the press and even Jonathan B. Turner almost lost faith.

In the Board itself there developed a cleavage between the “narrow gaugers” and the “broad gaugers” as Richard Moores calls them in his history of our college. Should the University and hence the college be a trade school or should it be a university? According to Moores, Regent Gregory performed the single most important act of his career when he included the Department of General Science and Literature in his proposed curriculum.

There was a great divergence between the new colleges of agriculture during the 20 to 25 year period following the Morrill Act, depending on personalities involved and the kind and amount of support they received. Illinois did not make much progress. Midst criticism and uncertainty and with no strong and continuous leadership, the curriculum as it existed by 1870 was changed but little. A major reason was because there was no faculty to get the job done. A one year farmers course was started, and there were some minor course additions and name changes, mostly in courses taught by other departments – “English”, for example, became “rhetoric.” There were conflicts over the role students should play in running the farm, criticism of the farm’s management – it was supposed to make money–, and a persisting doubt as to what “agriculture” really comprehended. There was no building for agriculture until 1900. Student enrollment dwindled until in 1895 when Eugene Davenport became Dean, only 9 of the 800 students enrolled at the University of Illinois were in agriculture. Domestic science fared even worse. In 1881 Regent Peabody said that it was an “experiment in darkness” and abolished it. It was not revived for 20 years.

Resurgence, Building and Growth

In 1899 the Board approved 35 courses in agriculture, sub-

mitted to it by Dean Davenport. Before then, fewer than 20 courses had evolved, despite the comprehensive listing of possibilities by the 1867 committee. Student enrollment climbed from the 9 in 1895 to 406 in 1905. By 1910 there were 250 in domestic science and the curriculum included 16 domestic science courses, despite the setback by Regent Peabody. By 1915 the College had been departmentalized. There were five, including Household Science. Animal Husbandry proudly boasted 31 courses. Dean Davenport could not make “thremmatology” take the place of animal breeding, but “olericulture” stuck. The required subjects for graduation did not include:

foreign language geology
 physics accounting

Entomology and library science were required. The student was told it was up to him to specialize if he so desired, since 48½ of the required 130 hours were free credits. The semester listing of required and elective courses and the credit hour structure still in use emerged during this period. By 1918 there were seven curricula:

General agriculture
 Farm organization and management
 Floriculture
 Home Economics
 Interior decoration
 Teacher training (Smith-Hughes)
 Landscape gardening

Research had gained momentum following passage of the Hatch Act, agricultural extension and vocational agriculture teacher training were now a part of the program, good men had been attracted, there was something to teach, and the reasons for teaching became more and more evident. The first World War gave the colleges an opportunity to show what they could do, and they proved themselves. The first quarter of this century was a great period for our colleges of agriculture. Public support ran high.

Though a necessary evolution, departmentalization was not an unmixed blessing with respect to the curriculum; the duplication arising from each department offering a basic required course plagued the colleges for many decades.

Questioning, Change, Recurring Doubts

The period from 1925 to 1940 I would characterize as one of growth in a modest fashion. There was an addition of new courses and new curricula but in a cautious vein. Resources were sometimes limited – there was a depression – and before much that was really innovative could be done. World War II came along. But as early as 1924, in the University catalogue the College of Agriculture announced that one of its objectives was to train “. . . for technical positions in industries closely related to agriculture” and for public service in research and extension and for teaching. There was a recognition of change, but the response was sporadic and must have varied markedly between institutions. “Agriculture” was again up for definition.

Challenge and Curricular Innovation

During the period from 1950 to 1970 many things happened to agricultural college curricula, though some had an earlier genesis. At the University of Illinois I would mark these things:

An honors program in agriculture

Inauguration of a sequence requirement (university-wide) in the social sciences and humanities.

Development of agricultural science options with flexibility making it possible for students headed for graduate work or professional education to add both depth and breadth.

Further integration of agriculture and business, agriculture and communications, agriculture and the life sciences.

Further involvement of students in the committee, planning, advising and decision-making processes of the college.

Slow but sure recognition of the impact of our international involvement on courses, course content, curricula, research, extra curricular concerns.

More articulation with the junior and community colleges.

More course and instructor evaluation, with students assuming a more important role.

The use of audio-visual and teaching aids.

More emphasis on undergraduate research or independent study courses.

A scheme under which students can establish a course of their own general design, providing they can find an instructor to be in charge and can entice a sufficient enrollment.

A swing toward more courses that try to put the fragments together and which try to deal with current problems.

More team effort in teaching and research. If we think about plant protection, then entomology, pathology, chemistry, microbiology, farm management and other subjects will all need to be considered. In a sense we are now doing by force of circumstance what the effective teachers have always done to create interest — show how the subject they are teaching relates to the solution of real problems and how other subjects the student is studying contribute to the solution.

A greater infusion of scientific discipline into some of the less exact scientific areas of agriculture, agricultural economics and rural sociology, for example, with the resultant effect on courses and course content.

Deans of resident instruction could no doubt add to this list, but these are the things that occur to a non-Dean simply as a result of osmosis.

Some Observations and Conclusions

1. The curriculum planners of a hundred years ago were just as "broad gauge" in their approach as we fancy we are today. They couldn't help it that they didn't have the last hundred years of research and discovery out of which to manufacture courses.

2. If an agricultural college graduate is not educated it is not because he didn't have certain way — it is because during his whole college career he was never imbued with the idea of becoming educated. Many fall into this category, and no more than a proportionate share are graduated from colleges of agriculture.

3. Opportunism is a good thing. (For support see Robert Burns)

4. Depth and breadth go together. It is probably impossible to truly have one without the other.

5. When we say that our program is more sophisticated it may mean that we have ceased to pay any attention to something quite fundamental.

6. One course well organized and well taught constitutes a better curriculum than seven courses not well organized and not well taught.

7. The fact that we find courses like physics, entomology, accounting and bacteriology — even geology — in and out and then back in and then back out simply means that they don't stand the competition for inclusion quite as well as some other courses — chemistry, botany and zoology, for example. They fall

into one of the many categories of things about which well informed men of good will can differ.

8. The college through its faculty must maintain its independence to decide what courses shall be taught and what curricula shall be offered, but its judgment in these respects should be influenced by inputs from its students, the advice it gets from citizen committees and requests it receives from farm, industry, business and consumer groups.

9. Since more than half of the courses leading to a degree in agriculture are taught by departments in other colleges it is imperative that a cooperative and friendly relation exist with these colleges and departments so agriculture can have an effective voice in improving the teaching and the content of those courses which affect it most. There should be an adequate committee mechanism for doing this — and for initiating and establishing new courses.

10. Many points of view exist about how, when, and what with regard to the general education content of the curriculum. A good case can be made for many different ways of doing it. But regardless of what we finally agree upon, the impenetrable will still not be penetrated.

The educational needs of students vary in ways we cannot possibly accommodate. No two are the same. Experience, background, capacity, intention and motivation make us all different. Analyzing the student is an important part of the process. This means the introduction of a human element. In my view, colleges of agriculture have done somewhat better than their sister colleges in introducing this element. It can make up for many curricular deficiencies.

One Final Comment

Kellogg and Knapp concluded in 1966 that colleges of agriculture are not vestiges of the past!

This is due in no small measure to a strong interest on the part of those in charge to not let them become so. One could say that rather than lose, they changed the game.

In passing judgment on our predecessors it often seems that when we look back thirty years we find them shortsighted; when we look back 100 years, we find them very wise. We today may get our best reading 100 years hence.

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CURRICULUM REFORM: A CASE EXAMPLE

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What judgment can you make when you discover one faculty of agriculture changing its curriculum to a form (structure) that the next institution you visit is in the process of abandoning? Is it that one form is appropriate at a given place and time? Or is the problem one of a different magnitude — a magnitude that a faculty, disenchanted with the present form of its curriculum, has failed to recognize?

The type of discovery referred to above has been made — and recently. It has been made by four-man study teams which constitute part of a five-year, comprehensive, systematic effort at curriculum design/development being undertaken by the Faculty of Agriculture, University College, Dublin (Ireland).² In these studies of curricula in agriculture we have found almost exclusive attention being given to curriculum, form (structure), and scarcely no attention being given to substance.

The purpose of this article is to sketch an overview of the pro-

ject by discussing some of the activities which the strategy (the operational basis) of the project provide for and the rationale (conceptual basis) by which the project is designed. Before going further, however, I should reveal the meaning attached to certain terms.

By form of curriculum I'm referring to the collection of various courses (subjects) into a range of options or areas of major, the ordering of these courses over a span of time, the labels to be attached to the various courses, combination of courses, options or majors and the like.

Substance refers to those "things to be learned" that the student is expected to give his attention to, how these "things to be learned" are organized into useful experiences for the learner, how the teacher directs his own efforts at facilitating the learner giving attention to critical "things to be learned" and developing the necessary proficiency with them.