Student Characteristics in Curriculum Planning

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It is significantly to the point of this article that it is being published simultaneously in the *Journal of College Student Personnel* and *The Journal of the National Association of Colleges and Teachers of Agriculture.* This article reports a joint endeavor in which counseling center study and college curriculum planning resulted in program modification to meet new needs of students on our campus. The article itself, in fact, is a joint endeavor with one author an academic dean and the other two members of a counseling center.[2]

PART I

Counseling centers have a role to play as contributors to faculty planning in addition to their activities with individuals and student groups. We are often ineffective in this because of difficulty in "sharing our wares." One of the reasons that studies of students have so little impact is that counseling centers do not make explicit to curriculum committees and teachers some of the potential uses of such information. As centers collect more and more information, it will be meaningless without perceptive translation and application to practical teaching and curriculum concerns.

Our excitement which led us to write this article comes from an endeavor in which our center shared with a curriculum committee implications of some of our research on student characteristics. From this joint enterprise resulted the program modifications reported in the second part of this paper. But, first a brief background.

Through the years the members of the Counseling Center have been concerned with facilitating the development of the college program by assisting faculty in understanding students, clarification of educational objectives and of some of the means for realization of these objectives. One of the means to these ends has been a series of over two dozen studies of student characteristics circulated among faculty. Included were biographical data, and measures of ability, interests and attitudes. In analyses of the data, attempts were made to relate these factors to such behaviours as academic achievement and educational choices, and to share with faculty our thinking about those reasons (best and otherwise) which bring our students to KSU.

In preparation for the meeting, members of the Counseling Center prepared a report which was later published (Danskin, Foster and Kennedy, 1965). In it an attempt was made to add what frequently is missing from research reports—to present not only data and interpretations, but to add implications of these data for curriculum planning and teaching.

This report and subsequent meetings of Counseling Center and Curriculum Committee members resulted in some recommendations and action which Dean Acker will describe later in this article. First, as an introduction to KSU students and to illustrate some of the material upon which the Agriculture Committee drew, some selected excerpts from the report are quoted.

One of the most rewarding responses to these reports came from the Chairman of the College of Agriculture Curriculum Committee. He requested that someone from the Center meet with his Committee to discuss the implications of our studies for curriculum planning in Agriculture.

SELECTIONS OF SOME DATA AND SOME POSSIBLE INTERPRETATIONS[3]

"You will quickly become aware of the mixture of findings and of opinion, possible interpretations, possible implications and educated guesses that follow.

"For ease of reading this section, results of study are in (regular type); possible interpretations are in (*italics*). You may want to read only the (regular type) before considering the (*italics*).

"FAMILY, COMMUNITY AND HIGH SCHOOL BACKGROUND

"The parents of Agriculture freshmen were in elementary school during the depression years and the 'Dust Bowl' era.

"A common reaction to phenomena such as a depression or a 'dust bowl' is to want to acquire (or have one's offspring acquire) something that cannot be lost, to 'acquire security.' Education is seen by our students' parents, and hence by the students, as a means to security — as acquiring tangible facts, skills and information that are not destroyed by economic conditions nor 'blown away' by the quirks of nature.

"The occupation of 69% of the fathers is farming, with another 3% in agriculture-related jobs. An additional 13% hold professional-managerial positions, 5% are in clerical and sales, 4% in skilled occupations and 3% in semi-skilled and unskilled jobs; 85% of the mothers are homemakers.

"Farming, skilled and semi-skilled jobs are concerned primarily with practical problems — with getting something tangible accomplished such as tilling the soil or machining a part. This is what life and work are to the entering student. With his experiences, what else could he expect college to be like?

"In general, the Ag frosh is the oldest child, with an average of 1.6 younger siblings and 0.8 older sibs.

1. Now Dean, College of Agriculture and Biological Sciences, South Dakota State University. There is no intent to commit the present administration of the K-State College of Agriculture to goals, policies, or procedures described in the article.
2. Part I is from the Counseling Center, Part II is from Agriculture.
3. All quoted material is taken from Danskin, Foster and Kennedy, 1965, pages 5-11.

Thus, the Ag frosh tends to be the first in his family to go to college. (Reported and discussed earlier in the original report was that 65% of the Ag students' mothers and 70% of their fathers had a high school education or less.)

"In general, the oldest child in a family tends to be the most conventional and dependent — to want to know what is expected and to want encouragement. How can teachers, advisers, counselors help him acquire the confidence to strike out on his own?

"PERCEPTIONS AND EXPECTATIONS OF KSU

"Entering students typically see KSU and their parents similarly — as benign and powerful figures. By coming to college, the students feel they can acquire the facts, figures and knowledge possessed by those at KSU. As a result of getting this information, the students feel they will be more like their parents and those at KSU—will acquire greater self-esteem and personal power. Failure to graduate is seen as a very deflating experience, which damages one's personal worth and effectiveness.

"He may come looking for the 'what-to-dos,' 'how-tos' and 'whens' rather than the 'how-comes' or 'whys.' He may want to get the facts, skills and answers he thinks are required to hold a secure job.

"This means that he might be neutral toward, or will react against, general education courses, unless they are related to jobs and job mobility. The importance of history and such courses will be quite abstract to him. He might see them as something imposed on him by other people and for irrelevant reasons that have little or nothing to do with his life. To interest him, they will need to be related to his world.

"Very probably, he'll be more likely to 'take to' less technical courses after he has acquired some practical knowledge of the sort he came to college to get in the first place.

"Should a college arrange its curricula to give something tangible initially, thus enhancing the chances of a student feeling secure enough to explore and be a little venturesome?

"ACADEMIC POTENTIAL AND MOTIVATIONS

"He is energetic and motivated, particularly when working on practical problems and when in a structured situation — when there is a well-defined organization, pattern of operation or explicit statements of what is expected. He is more motivated to become qualified to earn a living than to develop an elegant theory or to philosophize.

"He is energetic and motivated. He will be most likely to work hardest in situations dealing with problems he sees as related to the job he came to prepare for. When he feels he is getting practical and tangible knowledge, he, then, might be able to deal more comfortably with more abstract and basic knowledge.

"Compared with men in other KSU colleges, he is more reluctant to venture an opinion, express his ideas or feelings or draw attention to himself; is less sure of his ability to compete; and wants encouragement, understanding and to know that others are interested in him, though he is reluctant to solicit any of those. Continuing the comparison, he is less aggressive and venturesome in words and actions, less scientifically oriented, more of a problem-solver and doer than one to reflect on events and ideas, and prefers routine and sameness over change.

"He most likely will do his best work if, in the early stages of college or of a course, he is given a good deal of structure and if he can feel that others are interested in him and encouraging him. Once he senses that this is the case, then he will feel freer to venture his opinions and ideas.

"ACADEMIC PERFORMANCE AND ACADEMIC PATTERNS

"The average first-semester Grade Point Average (GPA) for Ag Frosh (1960-62) were 1.65, 1.45 and 1.76, respectively.

Around 53% of an entering freshman class will graduate from KSU. Of an entering class, about 25% will graduate in their original major; others will change majors an average of 1.4 times. Chances are that a student who is dismissed or drops with a GPA below 2.0 will not have changed majors.

"What do students who change curricula say is important in their decisions to change? Vocational interests and types of jobs available were rated as most important, with less concern shown for such matters as characteristics of faculty, abilities, and characteristics of academic programs. Students say that they get information important to curriculum planning primarily from parents and friends (fellow students) and these same two sources are most influential in decisions to change.

"Again, the continuation of the way of life the typical Ag student brings to K-State. As large a percentage of students in Agriculture as in any KSU college stick with their original major. The choice of a major is most linked with the future job; and advice in selecting a major comes from those the student knows best and with whom he feels most comfortable."

PART II

CURRICULUM MODIFICATIONS

One cannot describe accurately all reasons for curriculum changes made by college faculties. We may say that changes are prompted by trends, by changes being made at other institutions (which a given faculty admires and respects), by changes in the profession, and by increases in available knowledge within the discipline of the curriculum, or in sciences basic to the curriculum.

Many curriculum changes, though, are instead prompted by the *failure of a course or of a teacher in that course* to satisfy the needs of the curriculum and the students in that curriculum. As an academic dean, I view the dissatisfaction with courses, the desires for changes, and the pressures which bring about changes in curriculums. Almost without exception, specific curriculum changes seem to be basically prompted by the failure of a given course or series of courses or the failure of the departmental faculty teaching these courses to (1) adjust the content of the course in keeping with the times or (2) teach an exciting and stimulating course. Faculty members responsible for the curriculum seek alternatives. Too polite to condemn the instructor or department offering the weak or inappropriate course, they offer other reasons for the requested changes.

In 1960 the College of Agriculture faculty at Kansas State made significant changes in undergraduate curricula. Following a three-year study and discussion by a college-wide committee, the faculty voted by a narrow margin to (1) remove all agriculture courses from the freshman year; (2) enroll all new students in a common freshman program of 17 credits per semester; (3) adjust course offerings in the direction of eliminating freshman courses or replacing them with sophomore-level introductory courses in the agricultural disciplines; and (4) after some second thoughts concerning Item 1, to offer in the first semester of the freshman year a two-credit course entitled Agriculture in Our Society,

taught by the Academic Dean in Agriculture, to describe the broad socio-economic aspects of agriculture and to provide majors with some College of Agriculture contact their freshman year.

As usual, there were many hidden and subtle reasons for these changes, not all of which were listed or described in written or verbal form. There was a clear desire on the part of the faculty to be "academic" in their curriculum pattern.

Since Agriculture is a profession, there was relatively strong feeling that the curriculum should be organized as in other professional curriculums. The English, mathematics, chemistry, etc. should come first and should be prerequisite to courses in the chosen professional discipline. There was feeling this would raise the status of the College of Agriculture among the academic units on the K-State campus. It was recognized that a higher proportion of College of Agriculture graduates were entering graduate school for advanced training and so had greater need for mathematics, physics, chemistry, etc. Students seeking employment at the B.S. level would benefit in many cases by having a stronger scientific base. Agricultural Economics graduates, for example, should have more abilities to approach management in a quantitative fashion than formerly.

There was also evidence that many courses had not adjusted to changes in the disciplines they represented. Many faculty felt that only a drastic change would "shake loose" certain of these courses.

Because time, faculty, and a student population are not static, it is impossible to evaluate completely and accurately the wisdom of or the consequences of these 1960 changes. By 1962, however, several apparent consequences could be described. Scholastic dismissal rate of freshman and sophomore students was high. In June of 1962 (see Table 1) 95 students, of a student body of 624, were dismissed for low grades. The file on each student was reviewed by the academic dean and the student was arbitrarily and subjectively classed as high ability (capable of a B average at K-State), average ability (capable of a C average at K-State, or low ability (a few in this category could have earned a C average with much determination and hard work). There had been during the year a relatively high voluntary drop-out. Spring enrollment was 56 students below the fall enrollment.

During the fall of 1962 administrators of the college visited for one to two hours with each departmental faculty concerning the undergraduate curriculum. Two desires were expressed by most departmental faculties: (1) that the curriculum be made more flexible and adaptable to the individual student; and (2) that more agriculture courses be taught in the freshman year.

In July of 1962, when students expecting to enter in September, 1962, were pre-enrolled, the academic dean had instructed academic advisers to enroll new students in a credit load and in a selection of courses the adviser was convinced the student *could handle*. Advisers were provided ACT scores and were instructed to review each student's high school program with him before determining the proper fall semester schedule. This represented a departure from the 17-credit standard program approved in 1960 and was based on the assumption that "faculty are qualified and have the prerogative to determine a *graduation requirement* but they do not have the ability nor the prerogative, *as a group*, to decide the proper credit load or selection of courses for an individual student in an individual semester." This latter ability and prerogative is held by that student's academic adviser.

In January of 1963 a new college curriculum committee was named and instructed by the academic dean to give consideration to these faculty desires (more flexibility and agriculture courses for the freshman year). The academic dean and members of the committee consulted repeatedly with personnel of the Student Counseling Center, gleaning from these visits an insight into agriculture student characteristics. These characteristics are described earlier in the paper. By June of 1963 this committee recommended to the College of Agriculture faculty a reorganization of the agriculture curriculum to provide three options — production, science, and business and industries. (These curriculums are described in Table 2.)

Students who entered K-State in the fall of 1963 had the opportunity to take more freshman courses in agriculture and enter a more flexible curriculum pattern.

The impact of the (1) curriculum change and (2) meshing semester credit load and course selection with student abilities is credited with the marked improvement in student performance described in Table 1 for the 1963-64 academic year. Dismissals because of low grades were down 18 percent and among the "high ability" students dismissals were down 50 percent. Voluntary drop-outs were reduced about 60 percent and the number of students earning scholastic honors increased 28 percent.

Colleges of Agriculture were plagued with decreasing student enrollment from 1955 through 1961. In 1962 and 1963 a few Colleges of Agriculture had enrollment increases. There was no change at Kansas State. In the fall of 1964, however, enrollment rose from 675 to 828, a 24 percent increase. A similar increase occured in 1965 to a total of 980 for a two-year increase of 45 percent. Comments of students, Vo-Ag teachers, high school guidance counselors, and county agents support strongly the curriculum modifications made. They were likely a major reason for the increased enrollment.

College faculties spend much time discussing and realigning curriculums, *probably far too much time*. If the real reason for curriculum changes lies largely within the courses taught, major attention should be given to *the courses*, the course content, and the method of teaching. The philosophy held now by the College of Agriculture at K-State is that there now exists curriculums flexible enough to be useful to the departments concerned and the students. There is strength for any one student or department assuming (1) wise advising and (2) effective teaching in the courses. Present and future efforts of the administration are directed toward (1) maintaining well trained, interested, and aggressive academic advisers, and (2) constant review and improvement of individual courses, adaptation of these courses to changing disciplines, and rewarding of the teachers who are effective.

Implementation of desired changes is always limited by budget. We will, however, list the goals which were set and describe the degree to which they have been implemented or approached.

Goal 1: Enroll every new student in a course in or directly applied to his major. Presently, all new freshmen are enrolled in *the course, Agriculture in Our Society*, previously described. Students in the animal sciences and some students in agricultural education and other majors enroll their first semester in a two-credit course, Principles of Animal Science, plus one or more companion laboratory courses in Animal Husbandry, Dairy Science, or Poultry Science. Most new students in Agronomy or Horticulture enroll their first semester in Botany, a prerequisite to a second semester course in plant science taught jointly by Horticulture and Agronomy. Agricultural Education, Horticulture, Feed Technology, Bakery Management, and Flour Milling freshmen enroll in a department non-credit seminar along with other majors in their department. Students in the last three curriculums

may enroll with permission of the adviser in a three-credit Principles of Milling Course.

The Department of Agronomy is about evenly split on whether plant science and/or soils (now with a one-semester chemistry prerequisite) should be modified to be available to new freshmen without prerequisites.

Goal 2: Shift Agriculture in Our Society to a one-credit orientation course offered by *each department.*

The wisdom of this and the feasibility will depend on available staffing and number of freshmen per major. Presently, it would be deemed feasible in Animal Husbandry (about 80 freshmen); Horticulture, including majors in Horticulture, Retail Floriculture, Nursery Management, and Pre-Forestry; Agronomy; Agricultural Economics; Agricultural Education; and the Department of Flour and Feed Milling Industries (curriculums in Bakery Management, Feed Technology, and Flour Milling).

Goal 3: Make sure that every new student has at least one class, two credits or more, with less than 25 students in the class and under a teacher who has much empathy for students. It is preferred that this be in his major or in a closely related discipline, but it may be as beneficial in some other discipline. Because agriculture students are quite self-conscious and lack confidence in expressing themselves in groups and because it is so important that their early attempts be successful, the availability of one such course the freshman year seems paramount. Universities will move toward large lecture sections. However, because of the traits of the students described and the need to permit success, one such low-enrollment course per semester seems very important, especially in the early college experience.

Goal 4: The methods of handling and teaching courses in agriculture and (to the degree we can influence) in other colleges where our students take courses, should be devised with student characteristics clearly in mind.

The teacher should be oriented by the department head to the place of the course in the curriculum or curriculums, the names and content of prerequisite courses, the specific goals to be accomplished by the course and the background characteristics of students who will enroll in the course. In this respect it behooves the instructor to seek information the department head can provide. Sources of information are the general catalog, instructors of prerequisite courses, academic advisers of students in the curriculums which include the course in question, and personnel and publications of the Student Counseling Center.

Without such orientation I can imagine a new Ph.D. in the Animal Husbandry Department at Kansas State, where any high school graduate is admitted and where the beginning Animal Science course is available to new freshmen without prerequisites, teaching this introductory course according to pattern familiar to him at Rutgers University, where he took his B.S., M.S., and Ph.D., where admission is restricted to the top 40 percent of a high school graduating class, and where the introductory course may follow prerequisite courses in chemistry and zoology.

The students should be clearly informed by the instructor and, to some degree, by the general catalog as to (1) the specific goals of the course, (2) the competencies and understandings the student should bring with him into the course, (3) an outline list of projects or pattern of assignments which will describe to the student how the course goals will be achieved, and (4) bench marks the student can use during the term to measure his progress toward the goals. These bench marks may be simply the stated goals; the student can determine for himself as each topic is covered whether or not he has achieved or is achieving the goals. These bench marks may be quizzes, tests, or other assignments. In no case with which I am familiar does the catalog provide sufficient information to the student. Catalog descriptions are sketchy. Instructors vary. Each instructor must a c c o m p l i s h the above in his class.

In the summer of 1965 we selected 17 of 277 courses in the College of Agriculture and asked the instructor of each course to classify in writing the above points. We asked that this material be arranged in such a way that it could be handily reproduced and distributed to students in the course the first day of class. It may also be used to inform prospective students about the nature of these courses.

Because a large majority of Colleges of Agriculture students want to "solve problems", it is imperative that each instructor use a problem solving approach in teaching and that he use profusely examples and illustrations in lectures, recitations, and laboratories because most students are interested in prerequisite basic science subject material only to the degree that it will help them learn how to solve problems. It is imperative that the teacher of professional courses such as Soil Fertility or Applied Animal Nutrition integrate into these courses realistic applications of the basic sciences. In Applied Animal Nutrition, for example, it is proper and desirable that any discussion of ketosis include physiological concepts and organic chemistry. On examinations it should be expected that a student use his knowledge in these undergirding disciplines to answer completely questions pertaining to ketosis. In Soil Fertility it is proper that principles of physics, chemistry, and mathematics be used. In formulation of fertilizer mixtures or complex livestock rations algebra and higher forms of mathematics should be routine.

In contrasts, it is downright insulting for the student who has completed algebra to be subjected to the "Pearson Square" method of computing mixtures. The use of this layman's technique ridicules mathematics in the mind of the student and convinces him that algebra or higher mathematics really isn't important to him in learning to solve problems.

SUMMARY. Within a discipline or profession members are sometimes observed to be objective and logical in certain endeavors, illogical and subjective in other endeavors. I believe course and curriculum development in Colleges of Agriculture is an ideal example of the latter. We tend to be objective and logical in our pursuit of knowledge, yet often illogical and subjective in our transmission of knowledge to students.

The animal nutritionist who prescribes the protein content of swine rations first asks the age and weight of the pig, previous nutritional history, whether or not certain additives are to be included in the ration, and the sources of protein. He then recommends a specific level of protein, qualifying his recommendation a c c o r d i n g to protein source, etc.

When this same professor teaches nutrition to college students, he may tend to ignore the previous academic experience of the student, the pieces of knowledge in the mind of the student to which nutritional concepts could be hooked, etc. Instead he may concentrate *solely* on the nutritional concepts he wants the student to have learned by the close of the semester. His manner of teaching, therefore, emphasizes primarily the knowledge and concepts he wants mastered, often without regard to whether or not they may mesh or integrate with the student's previous knowledge and experiences.

Similarly, a soils scientist who recommends nitrogen fertilizer to help produce high corn yields, determines from a soil sample the present levels of nitrogen, phosphorus, potassium, zinc, etc.; and he quizzes the soil owner about previous cropping history and yields. He feels he *must* know these things so that he can recommend the proper soil treatment. When he prescribes a treatment, he prescribes it *according* to the yield desired and he recommends that the application be in certain form—broadcast vs. side-dress vs. plow-down—whether or not lime should be applied, etc.

Yet, a professor, in designing an undergraduate's agriculture curriculum, may tend to consider only the desired end product and ignore the measured traits of the student. He often fails to analyze the basic resource and formulate the educational mix and the method of application which would cause high germination of ideas, rapid and sturdy growth of the principles in the student's mind, and the full maturity of a high yield of concepts at the close of the course (growing season).

The Student Counseling Center at K-State has performed an exemplary service to the College of Agriculture faculty in describing the student characteristics which must be understood and considered by faculty for both curriculum organization and teaching methods, to approach maximum educational productivity.

REFERENCES

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TABLE I

Indicators of Academic Performance of Undergraduate Majors
College of Agriculture, 1961-62 to 1964-65[1]

PROBATION DESIGNATIONS

	1964-65[2]		1963-64		1962-63		1961-62	
	June	Feb.	June	Feb.	June	Feb.	June	Feb.
Total	143	155	37	109	33	102	50	147
Freshmen	112	90	16	52	19	54	26	94
Sophomores	15	26	6	31	7	20	8	27
Juniors	10	31	8	16	6	20	13	18
Seniors	4	7	3	7	1	7	3	6
Specials	2	1	4	3	0	1	1	2

ACADEMIC DISMISSALS, JUNE

	1964-65[3]	1963-64	1962-63	1961-62
Total	41	77	91	95
Freshmen	20	50	56	65
Sophomores	11	16	23	19
Juniors	8	4	7	7
Seniors	2	2	3	2
Specials	—	5	2	2
High ability	2	8	12	16
Average ability	29	33	34	34
Low ability	10	29	41	42
Withdrew during semester	—	7	4	3

FALL VS. SPRING ENROLLMENT

	1964-65		1963-64		1962-63		1961-62	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
Enrollment	828	810	675	654	672	615	680	624
Difference	18		21		57		56	

SCHOLASTIC HONORS

	1964-65[4]		1963-64		1962-63		1961-62	
	June	Feb.	June	Feb.	June	Feb.	June	Feb.
Total	65	50	60	58	56	49	47	not avail.
Freshmen	11	11	9	9	6	6	6	
Sophomores	14	12	12	6	16	9	10	
Juniors	21	8	20	15	16	14	18	
Seniors	19	19	18	28	18	20	15	

[1]excluding Landscape Architecture

[2]Probation level raised from 1.3 to 1.5 for freshmen and sophomores, and from 1.7 to 2.0 for juniors and seniors.

[3]Dismissal levels raised for all classifications, but freshmen who have attempted less than 30 credits not subject to dismissal.

[4]Scholastic honors requirement raised from 3.25 to 3.30.