

STUDENT PERCEPTIONS OF THE
LEARNING ENVIRONMENT DURING
AN EXPERIMENT IN CALENDAR
INNOVATION AT THE COLORADO COLLEGE

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Paul W. Hartman
Major professor

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ABSTRACT

STUDENT PERCEPTIONS OF THE LEARNING ENVIRONMENT DURING AN EXPERIMENT IN CALENDAR INNOVATION AT THE COLORADO COLLEGE

By

Paul W. Hartman

Educators have approached from many angles the problem of what factors in a student's college or university experience produce the most significant impact. Elements thought to contribute to change and development in college students are many, varied, and perplexingly linked in interaction. The capacities and norms of students who enroll at a particular college have a collective impact on individual students. The student's choice of a major field, his associations with peer subcultures, and his relationships with members of the faculty all are determinants of the experience of college which will shape his development.

Faculty have greater control over curriculum and instruction than any other component of the college environment. Arthur W. Chickering has theorized that changes in the interlocking mechanisms of curriculum,

teaching, and evaluation may have an impact on the entire environment students experience.¹

Joseph Axelrod described these components of the college experience as "the degree system."² The system, according to his analysis, has six parts: three structural dimensions that reflect the curricular side of the degree program and three implemental dimensions that have to do with the instructional side.

The purpose of this study is to investigate whether a change in a single dimension of the degree system has been followed by alterations in other dimensions of that system. Modification of learning-teaching behaviors was one goal of a new educational calendar implemented in September, 1970, by The Colorado College, an independent, privately supported liberal arts institution of about 1,750 students located in Colorado Springs, Colorado. Previous to the adoption of The Colorado College Plan, a traditional semester calendar had been employed. Students were involved in four or five courses at the same time during a term while faculty were teaching two or three courses.

The Colorado College Plan, within a two-semester over-structure, divides the academic calendar into nine time cells of three-and-one-half weeks. "Principal" courses may vary in length from one to three time cells, commonly referred to as blocks.

Students and faculty participating in principal courses have no other formal academic obligations. Credit is awarded on the basis of the time module: for a three-and-one-half week principal course, one unit; for a seven-week principal course, two units.

Using Axelrod's terminology, the academic calendar adopted by Colorado College changed a structural dimension, scheduling, of the degree system. It was anticipated that this modification of the system would be reflected in students' reporting of their day-by-day experience of the college environment. The instrument used to describe students' perception of the learning environment was the "Experience of College Questionnaire" (ECQ) created by Arthur W. Chickering.

The ECQ was first used in a study of twenty-one liberal arts colleges of which thirteen were participants in the five-year Project on Student Development in Small Colleges. Summing up the data obtained in their study, Chickering and Robert Blackburn indicated that differences between colleges in academic experiences, student-faculty relationships, and in the noncourse curriculum could be traced both to the characteristics of students who select these institutions and from the policies, practices, and general atmospheres of the institutions.³

In April, 1970, while Colorado College still operated within a traditional semester calendar, the

Experience of College Questionnaire was administered to 222 students randomly selected from a total student population of about 1,750. During May, 1972, near the end of the second year in which Colorado College had used the intensive course calendar, the ECQ was administered to 258 Colorado College students. Comparison of ECQ data between the two samples focused on five areas--classroom roles of faculty and students, students out-of-class learning experiences, the power syndrome in the teaching and learning process, the level of students' interest in their courses, and the influence students attributed to faculty. Twenty null hypotheses were constructed involving the data from 52 items of the 159-item questionnaire. The chi-square test for homogeneity was used to determine if differences in the frequencies of responses existed between the two samples. A post-test analysis was necessary to determine the directions of the differences that were discovered.

Some differences in the classroom environment are supported by data emerging from the two administrations of the ECQ. Students in the 1972 sample did report a larger role in shaping the instructional process. They did become more active participants in their own learning in terms of being involved more in class discussion than the 1970 sample, more prone to question the instructor as well as other students, and

more likely to work at desk problems or lab tasks during class periods than those in the previously studied group.

Given these differences in the reports of the two samples, it was surprising that the 1972 group was not significantly different in the amounts of time in courses used for listening and taking notes. Also, the evidence of change in the classroom environment was not apparent in their descriptions of study behaviors. No differences were found in the percentages of study time devoted to "memorizing" despite the fact that more class time was taken up with discussion and active participation, activities that were predicted to encourage study that involved higher level mental activities. The 1972 sample did report significantly larger percentages of study time spent applying concepts, analyzing material, and synthesizing ideas. Interpreting and evaluating were not significantly different in the time respondents reported devoting to them.

Further, the data related to the intensity of study patterns was mixed. While students in 1972 chose options describing their general patterns of study as more intensive than those in the 1970 group, their estimates of the amount of time spent studying during the previous week could not be shown to be greater.

The openness of the classroom environment did not carry over, according to the comparison of responses,

into increased student interaction with faculty nor into increased importance for intellectual exchange in the peer environment. The level of students' interest in their courses was demonstrably higher in 1972 than in 1970. The amount of influence attributed to faculty, however, was not significantly different.

¹Arthur W. Chickering, Education and Identity (San Francisco: Jossey-Bass, Inc., 1969), p. 323.

²Joseph Axelrod, The University Teacher as Artist (San Francisco: Jossey-Bass, Inc., 1973), pp. 165-72.

³Arthur W. Chickering and Robert Blackburn, "The Undergraduate" (unpublished manuscript, 1970), Ch. 1, p. 7.

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By

Paul W.¹⁷⁰⁰ Hartman

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CHAPTER I

THE PROBLEM

Introduction

Feldman and Newcomb's review of forty years of higher education research begins with a question: " . . . under what conditions have what kinds of students changed in what specific ways?"¹ Jacob² found little evidence of change in college students and concluded they simply became more homogeneous along with the rest of American society. Trent's evidence³ led him to believe that students who went to college did change in ways that were different from those who did not attend, but he concluded that characteristics of students as freshmen

¹Kenneth A. Feldman and Theodore M. Newcomb, The Impact of College on Students (San Francisco: Jossey-Bass, Inc., 1969), pp. 3-4.

²Philip E. Jacob, Changing Values in College: An Exploratory Study of the Impact of College Teaching (New York: Harper, 1957).

³J. W. Trent and L. L. Medsker, Beyond High School: A Psychosociological Study of 10,000 High School Graduates (San Francisco: Jossey-Bass, Inc., 1968).

controlled their changing. Katz and Associates,¹ too, produced research that demonstrated college experience can make a difference.

Astin has pursued the problem of determining the impact of colleges on students and, particularly, the possibility of differing kinds of impact among colleges. There are two stages in this research, Astin said. The first is to define and assess differences in characteristics of colleges and universities. The second is to identify particular environmental differences that account for different observed effects. If appropriate measurements of the environment can be developed, they can be used in studies of changes in college students stimulated by the institution. Pointing out the importance of this research, Astin said " . . . unless the effects can be accounted for by identifiable institutional characteristics, we cannot arrive at the generalizations needed for improving educational theory and for formulating sound educational policy."²

Factors contributing to change and development in college students are many, varied, and perplexingly linked in interaction. The capacities and norms of

¹Joseph Katz and Associates, No Time for Youth (San Francisco: Jossey-Bass, Inc., 1968).

²Alexander W. Astin, The College Environment (Washington, D.C.: The American Council on Education, 1968), p. 4.

students who enroll at a particular college have a collective impact on individual students. The student's choice of a major field, his associations with peer sub-cultures, and his relationships with members of the faculty all are determinants of the experience of college which will shape his development. All these factors, though, are filtered and modified by the individual student's background, personality, and previous experience.

Although there is debate over their importance as causators of student change, faculty have greater control over curriculum and instruction than any other component of the college environment.¹ Factors thought to be capable of contributing to desired changes in students can be activated by the academic program of the college or university. Chickering has advocated a number of actions necessary if education is to go beyond transmitting a body of information to students. First consideration, in his view, must go to the interlocking mechanisms of curriculum, teaching, and evaluation. Changes here, he stated, may have an impact on the entire environment students experience. "Change in this system is of primary importance because it is the pervasive background against which all institutional figures are cut; it defines the flora and fauna they encounter along

¹Joseph Axelrod, "An Experimental College Model," Educational Record 48 (Fall 1967): 327-37.

the way; it sets the tone and substance, and provides the principal anchors for student-faculty contacts and relationships; it is, or can be, the principal contributor to students' intellectual diet, the meat and potatoes, bread and butter of student discussion."¹

Need for the Study

Pursuing Chickering's suggestion, there is need to investigate what impact change in curriculum and instruction may have on other characteristics of the college environment students experience. Although it may be argued that few discernable changes in students accrue from formal classroom experiences, there may be modifications in these processes which lead toward improved educational results. Further, there is the probability that these processes affect all the experiences students share in attending a college.

Modification of learning-teaching behaviors was one goal of a new educational plan implemented in September, 1970, by The Colorado College, an independent, privately supported liberal arts institution of about 1,750 students located in Colorado Springs, Colorado. The approach to change in the curricular-instructional system was made through a structural change in the academic calendar.

¹Arthur W. Chickering, Education and Identity (San Francisco: Jossey-Bass, Inc., 1969), p. 323.

Previous to the adoption of the Colorado College Plan, a traditional semester calendar had been employed. Students were involved in four or five courses at the same time during a term while faculty were teaching two or three courses. The consensus of faculty opinion was that this system led to undesirable fragmentation of time and effort, reducing the capability for teaching and studying in depth.¹

In September, 1968, the Committee on Committees of the faculty recommended that the impending centennial of Colorado College in 1974 be marked by " . . . some auspicious new long-term development."² A planning study began at once and a faculty assistant to the president of the college was appointed to direct the preliminary self-study investigations over a two-year period. After exhaustive consultations and reviews, the Committee on Academic Program, at an October 27, 1969, faculty meeting, presented a proposal for a new academic calendar involving a modular course system. There were seventy-two votes in favor, fifty-three opposed.³

The Colorado College Plan, within a two-semester over-structure, divides the academic calendar into nine

¹The Colorado College Magazine, Winter 1970, p. 10.

²Ibid.

³Ibid.

time cells of three-and-one-half weeks. "Principal" courses may vary in length from one to three time cells, commonly referred to as blocks. Faculty and students participating in principal courses have no other formal academic obligations. "Extended half-courses" are for those subjects expected to require more time for absorption of material and are offered across three blocks. Two extended half-courses constitute a full load for students and professors. The "adjunct course," such as dance or instrumental music, may extend over the full year with students permitted to take as many as two in addition to their principal courses.

Credit is awarded on the basis of the time module: for a three-and-one-half week principal course, one unit; for a seven-week principal course, two units; for a ten-and-one-half week principal course, three units; for each extended half-course, ten-and-one-half weeks in duration, one-and-one-half units; for an adjunct course, one-fourth unit per semester.

Class size has a maximum limit of twenty-five students. For interdisciplinary courses taught by more than a single professor, class size is limited to fifteen students for each faculty member. Each course is assigned a course-room to be arranged and scheduled for use entirely at the discretion of those faculty and students participating in the course.

"Of all the scheduling and calendar options possible for colleges and universities during the rest of the 1970's," Hefferlin has written, "the intensive course plan may prove to be the most educationally significant yet it remains the most in need of research."¹

Heist underscored the importance of investigating the possibility of changes in Colorado College's environment following the implementation of the intensive course plan.

This revision of a total college program, coming near the end of a decade of attempted innovation throughout American higher education, is already being recognized as one major redress to many of the problems of undergraduate education. To numerous interested observers it will be seen as one of the boldest and most exciting renovations of a teaching-learning environment, if only because it is an accommodation of an entire student body and involving all members of the faculty, as well as all service segments of the institution. The very initiation and execution of a change in program of this scope will stand as a landmark in the history of liberal arts colleges.²

Purpose of the Study

Chickering asserted, in Education and Identity, the possibility that change in curriculum, instruction, and evaluation can affect the whole environment in which student development does or does not take place.

¹J. B. Lon Hefferlin, "Intensive Courses: An Old Idea Whose Time for Testing Has Come," Journal of Research and Development in Education 6 (Autumn 1972): 83-98.

²Paul Heist, "Considerations for the Evaluation of the Colorado College Plan," 1972, p. 1. (Mimeographed.)

Axelrod has warned that effective change, however, in the curricular-instructional system must encompass all elements within it. He has created a model for what he calls "the degree system." He claimed, "If a change is effected within a single dimension of the degree system without creating some dislocation within one or more of the other dimensions, then, in all likelihood, it is not a fundamental change."¹

The purpose of this study is to determine whether a single change in the degree system, if it is sufficiently radical in its nature, can alter other dimensions of the system. The change at Colorado College was structural, involving basically a calendar modification toward intensive (as opposed to concurrent participation in multiple courses) learning. Such an alteration can be expected to be perceived by students in the reporting of their experience of college.

The radical modification of the time-frame for teaching and learning might, for example, encourage change in methods of instruction and the roles of professors and students in the classroom. The purpose of this study is to investigate this area along with learning behaviors, faculty-student relationships, and peer relationships both before and after the adoption of the

¹Joseph Axelrod, The University Teacher as Artist (San Francisco: Jossey-Bass, Inc., 1973), p. 204.

modular calendar. An analysis of differences in the classroom and extra-class experiences which engaged Colorado College students immediately prior and two years subsequent to the adoption of the plan should reflect the potential of the theories proposed by Chickering and Axelrod.

Hypotheses

The hypotheses from which this study has developed were derived from expectations which stimulated the design and subsequent implementation of the Colorado College Plan. It was expected that the intensive learning mode would (1) provide " . . . more effective learning experiences by concentration of effort and time in one subject area and a higher degree of control over use of time"; (2) provide " . . . greater and more active participation in the setting of goals, determining the course content, and working more closely in small (er) groups"; (3) provide improved effectiveness by integrating academic, extra-curricular, and residential activities; and (4) " . . . encourage more efficient and effective use of resources and the multiple educational options for the variety of students as permitted by the particular, revised calendar and course reorganization."¹

¹Heist, "Colorado College Plan," p. 3.

The primary research question to be answered, then, was whether the expected differences in the experiences encountered by Colorado College students were achieved. Did, in fact, students and faculty work together in different ways after the implementation of the modular calendar? Was there better integration of the academic, co-curricular, and extra-curricular components of the college's program?

It should be noted, however, that all these issues may be viewed in another framework which may be generalized more readily to other situations. The expectations expressed in developing this plan deal, too, with the question of whether change in one dimension of the degree system can stimulate change in other ones. The first seventeen of the twenty hypotheses are organized according to the dimensions as defined by Axelrod.¹

Professor and Student Roles in the Classroom

1. Students in the sample taken after the implementation of the modular calendar (1972) will report spending greater amounts of time in the higher level mental activities during meetings of the course of reference than did students who were taking concurrent courses (1970).

¹Axelrod, The University Teacher as Artist, pp. 165-72.

2. Students in 1972 will choose statements describing a student-centered classroom environment in the course of reference more frequently than students in the 1970 sample.
3. Students in 1972 will choose statements describing a subject matter-centered environment in the course of reference less frequently than students in the 1970 sample.

Students' Out-of-Class Learning

4. Students in 1972 will report having spent greater amounts of time in the higher levels of mental activity while preparing for the course of reference than did students in the 1970 sample.
5. Students in the 1972 sample will select statements describing a more intensive general pattern of study than did students in the 1970 sample.
6. Students in the 1972 sample will report having spent a greater amount of time studying for courses in the previous week than did students in the 1970 sample.
7. Students in the 1972 sample will report having conversations with more faculty members outside class meetings than did students in 1970.

8. Students in the 1972 sample will report having more conversations with members of the faculty outside class meetings than did students in 1970.
9. Students in 1972 will report that a greater number of faculty members know them quite well and are concerned about their progress than did students in 1970.
10. Students in the 1972 sample will report having spent greater amounts of time discussing selected topics with their advisors than did students in the 1970 sample.
11. Students in the 1972 sample will report having spent greater amounts of time discussing selected topics with faculty members (other than their advisors) than did students in the 1970 sample.
12. Students in the 1972 sample will report having spent greater amounts of time discussing their academic areas of study with friends than did students in the 1970 sample.
13. Students in the 1972 sample will describe intellectual exchange and challenge as a more important part of their relationships with their best friends of the same sex than did students in the 1970 sample.

14. Students in the 1972 sample will describe intellectual exchange and challenge as a more important part of their relationships with their best friends of the opposite sex than did students in the 1970 sample.
15. Students in the 1972 sample will describe intellectual exchange and challenge as a more important part of their relationships with the groups of friends they associate with most than did students in the 1970 sample.

Power Syndrome in the Teaching
and Learning Process

16. Students in the 1972 sample will choose more frequently the statements describing a student-centered classroom environment and less frequently the options describing an instructor-centered classroom environment than did students in the 1970 sample.
17. Students in the 1972 sample will report greater student influence on course content and procedures than did students in the 1970 sample.

The three remaining hypotheses cannot be classified by the dimensions of the degree system as defined by Axelrod. They are included, however, since they are related to the degree system and its impact.

Degree of and Motivation for Students' Interest in Courses

18. Students in the 1972 sample will report feeling bored and uninterested in their courses less often and interested and attracted and challenged in their courses more often than will students in the 1970 sample.
19. Students in the 1972 sample will choose statements describing intrinsic motives for study more often and statements that reflect extrinsic motives less often than did students in the 1970 sample.

Influence of Faculty

20. Students in the 1972 sample will attribute greater influence to faculty in the six vectors of change than did students in the 1970 sample.

Theory

In their two-volume work entitled The Impact of College on Students, Feldman and Newcomb surveyed research data collected over the past forty years about college students and the ways in which colleges have influenced them. Regarding the changes that take place, the authors concluded that the most salient areas in which college students change include increases in open-mindedness, sensitivity to aesthetic and inner experiences,

intellectual interests and capacities, and independence. On the average, there is a decline in their authoritarianism, dogmatism, prejudice, religious commitment, and conservatism.¹

The factors contributing to this change begin with the student's home and family background. The educational level of parents and the family's socio-economic status are correlated with the degree and variety of values and attitudes with which the student emerges from his college experience.² The personality of the student is closely related. Personality characteristics have taken shape (with family background playing an important role) by the time a youth enters college and those characteristics contribute to the direction and degree of changes to which the student is open.³

The combination of both the factors mentioned above affects significantly the type of college the student will choose to attend. The environment of the college selected will have a bearing on the development

¹Feldman and Newcomb, Impact of College, p. 48.

²Trent and Medsker, Beyond High School, pp. 178-216.

³Feldman and Newcomb, Impact of College, pp. 257-305.

of the student.¹ Once enrolled in a college, all these forces will contribute to the student's choice of a major field, another source of stimuli for development.²

Simultaneously, the college student's socialization--in interaction with other students in the classroom, the residence hall, and wherever students congregate--makes its impact.³ The faculty, too, has a part in affecting the changes students make during college. The impact of professors is created most often through personal associations rather than as a function of the classroom environment.⁴

Clark, Heist, McConnell, Trow, and Yonge summarize these factors categorizing them as antecedent and environmental conditions. Antecedent conditions, including home, family, socio-economic status, are input factors and, at the same time, function as characteristics of the college environment. Other environmental conditions include faculty, curriculum, and extra-curricular

¹Ibid., pp. 106-50.

²Ibid., pp. 151, 193.

³Katz and Associates, No Time for Youth, pp. 255-317.

⁴Feldman and Newcomb, Impact of College, pp. 243-69; Robert C. Wilson, Jerry G. Gaff, Evelyn R. Dienst, Lynn Wood, and James L. Barry, College Professors and Their Impact on Students (New York: John Wiley & Sons, 1975), p. 107.

experiences. Both the input factors and the environmental characteristics influence the outcomes, i.e. the personal qualities of students who share the experience of a particular college. These outcomes include students' intellectual orientation, flexibility, autonomy, values, attitudes, and aspirations.¹

It is difficult for a college to alter the antecedent conditions which become a part of the college environment. Selection of students is not wholly controlled by the college. Institutions have their official criteria for entry, but, in higher education's buyers' market, it is the power of the institution's image to attract some students and divert others that may play an equal or more important role. It has been pointed out that such images do not come and go quickly.

They are the products of an institutional history and not of a public relations office. And in carrying messages to the public, they have helped to make the college what it is today. They steer choice and thus act to bring about that which they portray.²

Even though it is not totally within the college's power to enhance impact through selection of specific student types, the institution can affect

¹B. R. Clark, Paul Heist, T. R. McConnell, M. A. Trow, and George Yonge, Students and Colleges: Interaction and Change (Berkeley: Center for Research and Development in Higher Education, 1972), p. 13.

²Ibid., p. 83.

modifications that are believed to lead to improved student development. Advocating renovation of the interlocking arrangements of curriculum, teaching, and evaluation, Chickering declared, "Change in other areas can be important, but change in the central area of curriculum, teaching, and evaluation can send waves throughout the institution."¹

Axelrod has created a sharply defined model of these functions which he called the "degree system." Describing the university as a labyrinth of systems and supersystems, he said faculty have most control over the degree system wherein departments work out degree patterns, courses are offered, classes are taught, students are evaluated, and grades and credits are awarded.²

Academicians have tended to look at the curricular-instructional process as though it were a structure made up of static building blocks, Axelrod said. A change in the curriculum or in instructional style is seen as the substitution of one block for another. Basic reform turns out as impossible to effect, though, because the "architechtonic" model gives no insight into the real results of the change. In the systems model, there are no static parts of the

¹Chickering, Education and Identity, p. 323.

²Axelrod, The University Teacher as Artist, p. 323.

degree system. "Each part is but an aspect of the whole and nothing is static--all is in constant motion."¹

As Axelrod described the system, there are three "structural" dimensions and three "implemental" dimensions. The three that are structural reflect the curricular side of the degree program. The three implemental dimensions have to do with the instructional side.

The first structural dimension, program content, consists of the organization of the program that the student follows. It includes the entire complex of topics, problems, and texts and study areas covered. The scheduling system encompasses all the arrangements by which learners and teachers gather to take part in the teaching-learning process including when, where, how often, and for how long.² The grading and credit system includes all arrangements by which students are judged and certified. These three structural dimensions, Axelrod said, remain static. They describe only sets of potentials until they come in contact with the implemental dimensions.³

¹Ibid.

²The approach to change in the modular calendar employed by Colorado College was to alter this dimension.

³Axelrod, The University Teacher as Artist, pp. 165-69.

The first implemental dimension described in Axelrod's theory is that of professor and student roles in the instructional process. The roles are of three varieties: (1) those existing between the faculty member(s) and each student; (2) those existing between each student in the group and every other student; and (3) those between the teaching-learning group and each of its members. Student out-of-class learning is the dimension incorporating the experiences each learner undergoes as he prepares for class meetings and other sessions. The third implemental dimension includes a network of freedoms and controls Axelrod called the power syndrome in the teaching-learning process. The shape of this dimension is determined by who decides what about a course and its requirements.¹

To analyze a dynamic system of six moving parts requires, Axelrod said, first an inquiry into the nature of the parts and, second, inquiry about the relationship of the parts when all are in motion.

Chickering's assessment of the interrelatedness of curriculum, teaching, and evaluation concurs with the view of Axelrod. "To consider one element in isolation from the others," Chickering wrote in Education and Identity, "is unwise; to modify one part without

¹Ibid., pp. 169-72.

threatening the others is impossible. Those who attempt curricular change, new teaching practices, or grading reform discover early that juggling a part sends vibrations throughout the whole."¹ Returning to Axelrod's model, a change in program content toward more liberating kinds of studies produces no effect if the faculty member who is responsible for a course persists in teaching it in an authoritarian manner. Another example of blocking would be the situation in which a faculty member alters his style of instruction to increase discussion and other forms of student participation in the class meetings, but continues to evaluate on the basis of information memorized. The evaluative mode contradicts the method of instruction, encouraging the student to concentrate on remembering facts instead of criticizing, synthesizing, and applying ideas.

The intensive course plan adopted by Colorado College was such a radical change in the scheduling system, however, that there is reason to believe it might necessitate changes in other dimensions of the degree system. An examination of certain demographic data tends to provide confirmation that important changes occurred subsequent to the calendar innovation.

¹Chickering, Education and Identity, p. 196.

In the first place, there is broad acceptance of the new plan. Evaluation surveys conducted in the springs of 1971 and 1972 revealed that 90 percent of the students and 73 percent of the faculty preferred the new structure to the old. The faculty preference proportion is particularly interesting in view of the 58 percent majority which voted to adopt the new plan. The average class size had been reduced 30 percent (without increase in faculty size or reduction in student enrollment) to about fourteen per class, a figure which approximates the college's student-faculty ratio. Normal class attendance has risen from 85 percent to over 95 percent without any change in regulations to require students to attend class. Suspensions for academic failure dropped from fifty-eight in 1969-70 to fourteen in 1970-71 and twelve in 1971-72.¹

An instructor and his class have nearly complete flexibility in structuring their activities so that the purposes of the course can be achieved. The average course has tended to meet two to three hours each day. "Small groups or individuals may have tutorials or conferences with the professor, or the entire class

¹George A. Drake, "The Colorado College Plan," Critique, A Quarterly Memorandum, the Center for the Study of Higher Education, University of Toledo (March, 1973), p. 2.

may move off campus for periods of a single day up to the entire three and one-half weeks."¹

Less than 15 percent of the students described the method of instruction in their courses as "primarily lecture" in the survey taken in 1972. Twenty percent described it as "primarily discussion" and 31 percent said the method was a combination of lecture and discussion.² "To lecture with coverage similar to the semester course would require at least two to three hours per day. Few faculty possess the necessary stamina, and almost no students are willing to listen attentively for that length of time. Thus the new format encourages--almost demands--new approaches."³

Faculty members report unusual involvement of students in the teaching and learning process. "This involvement reflects itself in a consistently high level of preparation for class accompanied by an attitude often described as one of enthusiasm or joy of learning."⁴

¹Maxwell F. Taylor, Jr., and James B. Levison, "The Colorado College Plan: A Report of the Internal Evaluation Program for the Years 1970-74," p. 4. (Mimeographed.)

²Ibid., p. 17.

³Drake, "Colorado College Plan," p. 3.

⁴Taylor and Levison, "Colorado College Plan," pp. 4-5.

In an essay about the intensive course calendar, George A. Drake, then Dean of the College, wrote:

Any educational reform probably will be a balance of gains and losses, hopefully the gains outweighing the losses. The preliminary conclusion at Colorado College is that the single course system makes it somewhat more difficult to impart comprehensive factual knowledge. Thus, insofar as a good education consists of dissemination of knowledge, Colorado College may have lost ground. However, if major components of a high quality liberal education are the infusion of young minds with a desire to learn, and the provision of critical tools such as logical and penetrating thought, spoken and written clarity and style, appropriate methodologies, and the knowledge of "where to look," Colorado College almost certainly has made impressive advances. Students are more eager to learn and their intellectual sophistication is greater. In the opinion of most, these gains far outweigh the losses, and for that reason we have decided to retain and hopefully refine the new plan in the years immediately ahead.¹

In sum, then, the interlocks of curriculum, teaching, and evaluation must receive the highest priority of colleges if education is to go beyond the simple transmittal of information. The impact of student peers can be altered and channeled only through selection criteria and the long and indefinite process of changing norms and expectations. The degree system is more subject to modification by institutional decisions and faculty action. Change in this system can influence a large proportion of the experiences which students encounter and the activities in which they engage. The hypotheses of this study question whether a calendar

¹Drake, "Colorado College Plan."

modification toward intensive courses, involving basically a structural change (scheduling in Axelrod's model), can produce desired effects in the teaching and learning environment.

Overview

In Chapter II, methodology for studying the environment of colleges is reviewed. The discussion leads to a description of the Experience of College Questionnaire, designed by Arthur W. Chickering, which instrument was used in gathering the data analyzed in this study.

A description of the two samples studied, the nature of the data used, and the method of testing is included in Chapter III. Chapter III contains, too, a tabulation of the twenty hypotheses to be tested. The results of the data analysis are reported in Chapter IV.

Chapter V contains the summarization of the results of the study, the conclusions reached, a discussion of the study's limitations, and recommendations for further research.

CHAPTER II

REVIEW OF THEORY AND RELATED LITERATURE

Introduction

The purpose of this chapter is to review the theory and related literature in two areas: (1) the development of research methodology for investigating college environments and a review of previous studies of college environments in which the Experience of College Questionnaire, designed by Arthur W. Chickering, has been used.

Studies of College Environments

The 1957 study by Philip E. Jacob for the Hazen Foundation¹ concluded that students are remarkably homogeneous. No significant changes in their values after four years of college could be attributed to the character of the curriculum. And the quality of teaching, he said, has little effect on the value outcomes of general education. Jacob claimed the method of instruction, too, has only a minor impact on student

¹Jacob, Changing Values in College.

values, Discussion and student-centered methods, he said, cannot be proved to have more impact than lectures and recitation. Student-centered instruction may, he allowed, result in more satisfactory adjustment and a more congenial learning situation.

Throughout his inquiry, Jacob focussed on curricular influences upon students' formation of values.¹ Despite his failure to find changes in students resulting from the input of curriculum within the college environment, he did note the "peculiar potency" of certain institutions. The common element he found was a high level of expectancy appearing most frequently at private colleges of modest size. In certain instances, Jacob asserted, the instructor has significant influence. This occurs " . . . at places where (a) contact between faculty and students in the curriculum is intimate, (b) the faculty is 'student-centered,' and teachers derive a real sense of satisfaction and value from teaching their particular students . . . , (c) faculty (and perhaps students) have a large amount of responsibility for the educational program. . . . "²

Dressel and Mayhew credited the Jacob study with stimulating " . . . the largest single stream of

¹Ibid., p. xiii.

²Ibid., p. 78.

subsequent research into the impact of college on students."¹ There are two stages in the determination of what changes have taken place in the individual as a result of his experiences in college. The first is to describe accurately the features of a college's environment. Then the researcher can attempt to identify the characteristics responsible for certain varieties of impact.

One of the first empirical approaches to the study of collegiate environments was that developed by C. Robert Pace and George G. Stern. They developed the College Characteristics Index (CCI)² from Henry Murray's concept of personal needs and environmental press.³ In this conception, it is recognized that every individual has a variety of psychological and emotional needs that must be satisfied. The environment is viewed as a press that either satisfies or frustrates the attempts to satisfy those needs. Pace and Stern developed an inventory of needs (Activities Index) and then the instrument

¹Paul L. Dressel and Lewis B. Mayhew, Higher Education as a Field of Study (San Francisco: Jossey-Bass, Inc.), p. 10.

²C. R. Pace and G. G. Stern, "An Approach to the Measurement of Psychological Characteristics of College Environments," Journal of Educational Psychology 49 (October 1958): 269-77.

³Henry Murray, Explorations in Personality (New York: Oxford University Press, 1938).

through which the college's press is described. Each of the instruments includes 300 items. The Activities Index is made up of ordinary activities to which like-dislike answers are given. The College Characteristics Index is composed of statements about facets of the college environments: events, conditions, practices, opportunities, pressures, and similar items. It requires true-false answers.

"The scales of these instruments are intended to be parallel," Feldman and Newcomb wrote, those of the Activities Index measure behavior from which personality needs are inferred and those of the College Characteristics Index measure the conditions in the environment likely " . . . to facilitate or impede their expression."¹ Pace and Stern argued that institutions must be able to evaluate the press they exert because of the relationship between institutional press and institutional purpose. Press, they claimed, is the " . . . operational definition of objectives or the implicit influence of environment upon students."²

¹Feldman and Newcomb, Impact of College, pp. 124-25.

²Pace and Stern, "Psychological Characteristics," p. 276.

Astin and Holland¹ developed the Environmental Assessment Technique (EAT) to measure colleges on demographic dimensions which can be anticipated to define impact. The EAT has eight measures: institutional size, intelligence level of students, and the proportion of students in one of six types of major fields described as realistic, intellectual, social, conventional, enterprising, and artistic.

"The Environmental Assessment Technique," the authors wrote,

is based on the notion . . . that a major portion of environmental forces is transmitted through other people. We can infer from this that the character of a social environment is dependent upon the nature of its members. Moreover, the dominant features of an environment are dependent upon the typical characteristics of its members. If, then, we know the character of the people in a group, we should know the climate that group creates.²

The designers of the EAT tested its validity by using the College Characteristics Index. They concluded that the attributes of a student body, as defined by the EAT, " . . . reflect a major portion" of the college environment as measured by the CCI.³

¹Alexander W. Astin and J. L. Holland, "The Environmental Assessment Technique: A Way to Measure College Environments," Journal of Educational Psychology 52 (December 1961): 308-16.

²Ibid., p. 308.

³Ibid., p. 316.

A year later, Astin used factor analysis of thirty-three major institutional characteristics to determine the main items which differentiate among higher educational institutions.¹ In selecting the thirty-three institutional variables, he attempted to include all methods which have been used in describing institutions in previous studies and data elements that were readily available. These characteristics included six related to institutional type (private vs. public control, degree level offered, curriculum emphasis, etc.); six having to do with finance (tuition, endowment, operating budget, etc.); twelve characteristics of the students enrolled (size of enrollment, aptitude level, and six orientations of students used in the EAT to describe the institution's curricular emphasis by the concentration of students majoring in certain disciplines; two measures of faculty characteristics (percentage holding doctoral degrees and faculty-student ratio); and six miscellaneous items.²

Astin's factor analysis resulted in the emergence of six principal demographic dimensions along which institutions appeared to differ. These were: affluence, size,

¹Alexander W. Astin, "An Empirical Characterization of Higher Educational Institutions," Journal of Educational Psychology 53 (October 1962): 224-35.

²Ibid., pp. 225-27.

private vs. public control, masculinity, realistic emphasis, and homogeneity.¹ Affluence accounted for the largest proportion of variance and had high loadings from a college's financial resources, student quality, faculty quality, and several environmental characteristics.

Subsequent to participation in developing the College Characteristics Index, Pace constructed a different instrument, the College and University Environment Scales (CUES). The CUES approach, he wrote, asks the question, "What do students perceive to be characteristic of the environment?"² The definition of the college's environment is the consensus of the collective perceptions of its students. He continued,

The assumed validity of the collective perception approach lies in the argument that "fifty million Frenchmen can't be wrong." Regardless of individual behavior, or assorted physical facts such as money or size, the environment, in a psychological sense, is what it is perceived to be by the people who live in it.³

Referring to the intended parallelism of the Activities Index and the College Characteristics Index, Pace said the anticipated reciprocity was not confirmed. The first edition of CUES consisted of 150 CCI items

¹Ibid., pp. 229-31.

²C. Robert Pace, College and University Environment Scales, Technical Manual, 2nd ed. (Princeton, N.J.: Educational Testing Service, 1969), p. 7.

³Ibid.

selected because they discriminated between environments of different colleges. The items were organized into five scales that reflected the dimensions of the differences: practicality, community awareness, propriety, and scholarship.¹

Astin developed still another assessment of college environments through his Inventory of College Activities (ICA) questionnaire. In this conception, Astin viewed the college environment as including " . . . any characteristic of the college that constitutes a potential stimulus for the student, i.e., that is capable of changing the student's sensory input."² The ICA design attempted to include " . . . as many environmental stimuli as possible that could be observed by undergraduate students and reported in a questionnaire."³ The categories of stimuli included were the peer environment, the classroom environment, the administrative environment, and the physical environment. The four divisions have a total of 275 items and the instrument contains, too, 77 items concerning the image of the institution and 48 interrogatories about the students'

¹Ibid., p. 9.

²Alexander W. Astin, The College Environment (Washington, D.C.: The American Council on Education, 1968), p. 3.

³Ibid.

personal characteristics. The latter two divisions were included in order to permit investigation of the relationships between the three types of data.

The ICA was completed, in Astin's first use of the instrument, by 30,570 students at 246 institutions. Using factor analyses of the correlations among the items, twenty-seven patterns of environmental stimuli were found to describe differences among institutions. Factor analysis of the seventy-seven items in which students reported their impressions of the college environment yielded eight measures of students' perceptions of the institutions in which they were enrolled.¹

The Experience of College Questionnaire (ECQ), created by Arthur W. Chickering, is closer in the rationale of its design to the Inventory of College Activities than to any of its predecessors. The 159-item instrument asks for responses that reflect actual conditions rather than generalizations by directing the respondents' attention to specific situations and time intervals. There are thirty-nine items having to do with academic experiences, twenty-four that deal with student-faculty relationships, forty-nine with peer relationships, and the balance seek information about participation in extracurricular activities.²

¹Ibid., p. 119.

²A copy of the instrument is included in the appendix.

Chickering and Blackburn wrote about the importance of the ECQ as follows:

. . . the daily behaviors, the routine and exceptional encounters, the range of sensitivities aroused or extinguished, flow from college policies, programs, and practices. The findings from the ECQ are important because it is the life thus generated and experienced for weeks, months, and years, which accelerates or retards, amplifies, distorts, or stifles the learning and personal development of those who live it.¹

The ECQ was first used in a study of twenty-one liberal arts colleges of which thirteen were participants in the five-year Project on Student Development in Small Colleges. The other eight institutions were participants in a study conducted by the Center for the Study of Higher Education at the University of Michigan.²

Research Using the ECQ

The twenty-one institutions, Chickering reported in "The Undergraduate," did not constitute a random sample, but did " . . . include almost every kind of undergraduate liberal arts institution: a large multi-purpose university with two of its sub-units, public state colleges, and several private institutions-- 'church' and 'non-church,' prestigious and selective,

¹Arthur W. Chickering and Robert Blackburn, "The Undergraduate" (unpublished manuscript, 1970), Ch. 1, p. 7.

²Ibid., Ch. 1, p. 8.

'open' admissions and financially struggling, liberal and experimental, conservative and traditional."¹

Chickering and Blackburn discussed nine of the colleges in detail and included specific data from four using fictitious names. Kildew was named for the patron saints of progressivism--Kirkpatrick and Dewey. It had little structure and few rules with a highly flexible curriculum. Self-evaluation, supplemented by instructor comments, had replaced grades. Classic featured a core curriculum based on the Great Books tradition. Its curriculum was a tight, integrated sequence of courses for performance in which the faculty awarded grades to students.

Elder and Savior were more traditional colleges. Both incorporated distribution requirements, majors, minors, lectures, and exams. Elder had a more distinctive reputation, was more affluent, and provided opportunity for independent study and off-campus experience. Savior was more demonstrably religiously oriented.²

Students in the Project colleges were asked in the Experience of College Questionnaire what percentage of their class time was spent listening and taking notes; doing your own thinking about the ideas presented;

¹Ibid.

²Ibid., Ch. 1, pp. 8-10.

actively working at desk problems or lab tasks letting your mind wander, daydreaming, or dozing; making statements to the class; actively doing things unrelated to the class. At all the colleges, less than 5 percent of the time was spent daydreaming, dozing, or doing things unrelated to class. However, where much time was spent listening and taking notes, little time was spent in making statements to the class, and in discussion. The time spent thinking about the ideas presented was only about half that which occurs when there is more frequent participation in discussion and presentations.¹

At Elder and Savior, the writers reported, 60-70 percent spent more than half their time listening, 75-80 percent spent less than 5 percent of their time in class discussion, and only 20 percent spent more than half their time thinking about the ideas being presented. Fully 30 percent of the students at these colleges used 5 percent or less of their time in class to think about the ideas being presented. At Kildew and Classic where time is more evenly divided between listening and taking notes in class and participating in discussion, more than twice as many students reported spending a substantial amount of time thinking about ideas.²

¹Ibid., Ch. 2, pp. 11-13.

²Ibid., Ch. 2, p. 14.

"Of course, in one sense, there is nothing really very new about these findings," Chickering and Blackburn wrote.

Studies comparing lecture and discussion classes consistently have found more active thinking and participation in discussion classes. What is new is the evidence that institutional differences are related to different institutional practices and orientations regarding teaching and learning.¹

ECQ data confirmed, too, that the kinds of activities which occur during class and are associated with varied teaching styles influence student activities in preparing for class.

At Elder and Savior--where most time in class is spent listening and taking notes--most time preparing for class is spent memorizing and little time is given higher level mental activities. At Classic and Kildew--where there is more balance between listening and taking notes and participating in discussions, and where doing your own thinking occurs more frequently in class--substantially less time is spent memorizing and complex mental activities are much more frequently employed in class preparation.²

There were variances among colleges in the role played by the teacher in the classroom. For 70 percent of the students at Elder and Savior, the teacher "ran" the course. In the words of the questionnaire, the teacher "dispenses knowledge for them to master," or "flexibly manages things to help them learn." The collegial, working together relationship occurred more frequently at Classic and at Kildew 80 percent of the

¹Ibid.

²Ibid., Ch. 2, p. 16.

students reported working along with the teacher or mainly using him as a resource for their own learning.¹

Another set of questions in the ECQ is concerned with whether motivation for study is intrinsic or extrinsic. At Savior, 34 percent described their reason for studying was to get a good grade or complete a requirement. At Kildew, 48 percent said interest, enjoyment, or questions of concern caused them to study.²

In all the colleges together, 35 percent of the students claimed they were bored frequently or most of the time. At Kildew, though, two-thirds of the students said they were challenged frequently or most of the time and 75 percent reported they were interested frequently or most of the time.³

Another section of the Experience of College Questionnaire explores student-faculty relationships. Students at Project colleges were asked, "With how many individual members of the faculty or administration have you had conversations lasting more than five minutes during the present semester?" At Elder and Savior, only 20 percent of the students had conversations with five or more faculty or administrators. At Classic,

¹Ibid., Ch. 2, p. 20.

²Ibid., Ch. 2, pp. 21-22.

³Ibid., Ch. 2, p. 22.

about 40 percent reported five or more such conversations; at Kildew, the figure was about 55 percent.¹

At all the colleges except Kildew, only 5-10 percent of the students spent more than one-half hour talking about formal academic arrangements, future educational or vocational plans, or problems of a personal nature with faculty. Between 40 and 60 percent spent no time at all discussing such topics with members of the faculty and administration.²

At Elder and Savior, 50 percent indicated that they did not have enough contact with faculty and 25-30 percent indicated they did not receive the degree of guidance they wanted. At Classic and Kildew, the frequencies were somewhat lower. Chickering and Blackburn pointed out that the more prevalent expression of dissatisfaction with the amount of contact versus the amount of guidance was significant. "Apparently it is more contact, exchange, interaction, that students most often want--not guidance, exhortation, advice."³

The writers speculated about the student-faculty relationships and suggested that a " . . . major reason for limited student-faculty relationships lies in the

¹Ibid., Ch. 3, p. 2.

²Ibid., Ch. 3, p. 5.

³Ibid., Ch. 3, p. 10.

dominant theme of courses, classes, and assignments--
 'Listen, don't talk. Memorize, don't think. I serve,
 you receive.'"¹

They continued,

Thus student-faculty relationships and academic practices and experiences are closely interactive. This complex web of relationships makes change difficult. Touch one element and the whole network shakes. Defenders rush out to spin sticky strands around the intruder, quickly immobilizing him, perhaps for later eating. Any damage is repaired. The web resumes its former shape. That's why institutional change comes so hard, and why so few venture to attempt it.²

Because of the sizable expenditures colleges make on the noncourse curriculum, the ECQ includes a section dealing with students' participation. Among the Project colleges, 90 percent of the students participated in at least one of the organized activities. Frequency of participation varied little with class rank, although leadership did increase with grade level.

Only about 10 percent limited their participation to one area and 25-35 percent participated in two or three activities with similar proportions joining in four or five.³ The ECQ data determined that students at Elder and Savior assume positions of leadership more

¹Ibid., Ch. 3, p. 14.

²Ibid.

³Ibid., Ch. 4, p. 9.

frequently than those at Classic and Kildew.¹ Kildew students participated in community government and in drama, music, and art activities. They were less frequent joiners in activities concerning school spirit or hospitality, varsity and intramural sports, or in the activities of religious groups.²

Students at the Project colleges tended to spend more time studying than in any other single activity. Another large portion of time was used talking informally with others. At a college where reading for pleasure and talking informally received comparatively little time, watching TV, playing games, or participating in sports were likely to receive more.³ At Elder, 69 per cent of the students averaged more than thirty hours per week studying and spent substantial amounts of time talking with friends and attending movies and plays. At Kildew, more than half the students reported spending thirty or more hours per week studying with reading for pleasure, talking with friends, and attending movies and plays all receiving large amounts of time.⁴

¹Ibid., Ch. 4, p. 11.

²Ibid., Ch. 4, p. 12.

³Ibid., Ch. 4, pp. 13-14.

⁴Ibid., Ch. 4, pp. 14-15.

Finally, the Experience of College Questionnaire defined differences among the Project colleges in peer relationships. Chickering and Blackburn asserted,

It is important . . . how many different persons one comes to know superficially and well. What they talk about and do together influences the impact of new ideas and experiences. These exchanges reinforce, alter, or extinguish the insights and points of view encountered in readings and class discussions, in contact with faculty members, and in the non-course curriculum.¹

At Kildew and Classic, close friendships tended to be concentrated among fewer persons than at Elder and Savior where 50-60 percent of the students reported ten or more close friends.² Students at Kildew, Classic, and Elder were found to spend considerably more time discussing serious topics than students at Savior.³ Intellectual exchange and challenge occurred among best friends about half again as often at Kildew, Classic, and Elder as at Savior.⁴

The writers reported that 75 percent of the students at all colleges described their relationships with close friends as important influences, with close friends

¹Ibid., Ch. 5, p. 5.

²Ibid.

³Ibid., Ch. 5, p. 8.

⁴Ibid., Ch. 5, p. 12.

of the opposite sex described consistently as more influential in all areas than close friends of the same sex.¹

Summing up the data obtained through use of the ECQ with students in all twenty-one colleges, Chickering and Blackburn declared, "Inter-collegiate differences found in academic experiences and behaviors, in student-faculty relationships, and in the non-course curriculum stem both from the characteristics of the students who select these institutions, and from the characteristics of the institutions themselves--from their different policies, practices, and general atmospheres."²

Discussion

The importance of developing adequate measures of collegiate environments is tied to the question of what characteristics have been present in a campus climate where students tend to change in specific ways. Astin points out that the presence of students having similar characteristics in institutions with different inputs opens the possibility of longitudinal studies which could identify differing institutional effects. To accommodate such a result, though, it is necessary to measure characteristics which differentiate between

¹Ibid., Ch. 5, p. 13.

²Ibid., Ch. 5, p. 16.

college environments. "In brief," Astin said, "the task of defining the college environment is one of identifying and measuring those institutional characteristics that are likely to have some impact on students' development."¹

Pace, who had helped to develop the College Characteristics Index, was dissatisfied with its effectiveness. As was pointed out earlier, it did not prove to be parallel with the personality needs of students as expressed in the Activities Index. Further, many of the items differentiated between characteristics of students rather than institutions.

Pace developed the College and University Environment Scales using items from the CCI which related students' perceptions of their environment. The result, he found, was that differences among institutions could be described.

Astin's Environmental Assessment Technique was an attempt to ascertain whether utilizing readily available demographic data about institutions would predict accurately the characteristics which would be identified through CUES. The EAT was inexpensive and moderately successful in its predictive capacity.

Astin based his later methodology for measuring the environment of a college or university on obtaining

¹Astin, The College Environment, p. 2.

from student observers an accounting of the institution's environmental stimuli. He defined environmental stimulus as " . . . any behavior, event, or other observable characteristic of the institution capable of changing the student's sensory input, the existence or occurrence of which can be confirmed by independent observation."¹

Both the College Characteristics Index and the College and University Environment Scales were criticized by Astin for their reliance on the student's impressions or image of the institutional climate. The observer's judgment, Astin claimed, " . . . can neither be validated by independent observation or, in itself, change the sensory input of other students."²

Pace defends the "students' image" approach,⁴ saying " . . . the perceived reality, whatever it is, influences one's behavior and response. Thus, realistically, what people think is true is true for them."³

Astin's Inventory of College Activities was comprised of interrogatories about specific, observable stimuli within the collegiate environment. The ICA, for example, asks respondents the number of hours weekly they spent attending class, reading for pleasure, day-dreaming. It asks how often (frequently, occasionally,

¹Ibid., p. 5.

²Ibid., p. 7.

³Pace, Technical Manual, p. 7.

or not at all) students participated in more than sixty activities including playing chess, staying up all night, drinking beer, and arguing with other students. Its section on describing one of the respondent's courses asks questions about the orderliness of the class environment, the methods of instruction, and the characteristics of the instructor.

Chickering's Experience of College Questionnaire is very similar in its reliance on definite observations of students. It is more specific in its investigation of academic experiences, for example asking questions which define the instructor's role in a particular class as opposed to the students' participation. It includes, too, questions which establish students' learning responses to the instructor's methods.

In addition, Chickering's ECQ places more emphasis than does the ICA on the quality of relationships between faculty and students and among students. Questions ask the amounts of time spent with faculty and with peers and the types of conversations engaged in with each.

CHAPTER III

DESIGN OF THE STUDY

Introduction

The design of this study is discussed in four sections: (1) a description of the samples; (2) a discussion of the nature of the data selected for the study; (3) the positing of testable hypotheses; and (4) an outline of the analytical procedures used.

Sample

In April, 1970, while Colorado College still operated within a traditional semester calendar, the Experience of College Questionnaire was administered to 222 students randomly selected from a total student population of about 1,750. During May, 1972, near the end of the second year in which Colorado College had used an intensive course calendar, the ECQ was administered to 258 Colorado College students. The composition of the two samples is shown in Table 1. For this study, the sample includes all 1970 and 1972 respondents.

TABLE 1
COMPOSITION OF SAMPLES

1970			
CLASS RANK:		CLASS RANK:	
senior	36	senior	52
junior	54	junior	80
sophomore	59	sophomore	61
freshman	70	freshman	65
SEX:		SEX:	
male	117	male	126
female	89	female	108
unknown	16	unknown	24
DIVISION OF MAJOR FIELD:		DIVISION OF MAJOR FIELD:	
humanities	68	humanities	72
natural sciences	52	natural sciences	69
social sciences	63	sciences	66
unknown	39	unknown	51
DIVISION OF COURSE OF REFERENCE:		DIVISION OF COURSE OF REFERENCE:	
humanities	97	humanities	96
natural sciences	57	natural sciences	79
social sciences	61	social sciences	76
interdivisional	7	interdivisional	3
		unknown	7
LIVING ARRANGEMENT:		LIVING ARRANGEMENT:	
on-campus housing	170	on-campus housing	181
off-campus	46	off-campus	73
at home	4	at home	4
unknown	2		

Nature of the Data

The Experience of College Questionnaire, as discussed in Chapter II above, is divided into five categories of questions. There are thirty-eight items about academic experiences and activities: twenty-five are concerned with student-faculty relationships; fifty ask about relationships with peers; and twenty are related to participation in extra-curricular activities.

The areas of concern to this study were derived from expectations of the intensive course plan at Colorado College. The investigation is organized to parallel the implemental dimensions of the degree system as defined in Axelrod's model. This organization facilitates the purpose of the study which is to determine whether there were differences in implemental functions at the college subsequent to changes in a structural dimension. The first three groupings of the data to be investigated are (1) professor and student roles in the classroom, (2) students' out-of-class learning experiences, and (3) that dimension Axelrod described as "the power syndrome in the teaching-learning process." The study also investigates (4) the level of students' interest in their courses and (5) the influence of faculty.

Professor and Student Roles in the Classroom

Three sets of items from the ECQ provided the data for considering the classroom environment. A cluster of items asked for an estimate of the amount of class time the students spent in four different mental activities.

- Item 23: Listening to what is being said, primarily in order to remember (include taking notes if you do this).
- Item 24: Doing your own thinking about the ideas presented: analyzing, thinking of implications, checking for soundness, mentally criticizing, etc.
- Item 25: Actively working at desk problems or lab tasks relevant to the class.
- Item 26: Participating in discussion, making statements to the class, speeches, formal presentations.

Listening and taking notes is a passive learning behavior, while thinking about the ideas, working at desk or laboratory tasks, and participating in discussion represent active learning roles.

Positive answers to items 9, 15, 16, and 19 reflect an information-centered approach in the course of reference.

- Item 9: Lectures follow the textbook.
- Item 15: We sometimes have unannounced quizzes.
- Item 16: Examinations are usually of the "objective" type.
- Item 19: I almost never speak unless called on.

At the same time, positive answers to items 10, 13, 17, 20, and 21 indicate the course was taught in an environment that encouraged student participation and involvement.

Item 10: The teacher encourages class discussion.

Item 13: The teacher knows my name.

Item 17: Examinations are usually of the "essay" type.

Item 20: I sometimes argue openly with the teacher.

Item 21: I sometimes argue openly with other students in the class.

Students' Out-of-Class Learning Experiences

Students' learning experiences outside or exclusive of classroom experiences are depicted in eleven items or sets of items. Three items or sets have to do with study behaviors of students in their preparation for the course or courses in which they were enrolled; four explore the relationships between students and faculty; and four inquire about the importance of intellectual concerns in peer relationships.

Study behaviors.--The first cluster of items, 28, 29, 30, 31, 32, and 33, asks respondents for an estimate of time spent in six categories of mental activities while studying for the course of reference.

The categories are derived from the taxonomy of cognitive educational goals as constructed by Bloom et al.¹

- Item 28: Memorizing: learning specific things, works, ideas, methods so that you can remember them pretty much in the same form in which you encountered them.
- Item 29: Interpreting: mentally putting things in different terms, translating, reorganizing, making inferences or extensions of thinking based on principles given.
- Item 30: Applying: drawing upon a variety of concepts and applying them to new problems or situations.
- Item 31: Analyzing: analyzing material (data, literary works, argumentative or discursive, etc.) into parts and detecting relationships among parts and ways they are organized.
- Item 32: Synthesizing: organizing ideas, information, or parts into new plans, relationships, or structures, as in developing plans for an experiment, writing a poem or essay, deriving principles from data, integrating information from diverse sources.
- Item 33: Evaluating: making judgments about the value of materials (concepts, evidence, theories, arguments, communications) and methods.

Item 4 requires a response describing the pace of the student's general pattern of study. The four choice options are divided into pairs which may be classified as less intensive and more intensive.

¹Benjamin S. Bloom, M. D. Englehart, W. H. Hill, E. J. Furst, and D. R. Krathwohl, Taxonomy of Educational Objectives, Handbook I: Cognitive Domain (New York: Longmans, Green, 1956).

option - I usually coast, but work fairly hard at times.

less
intensive

option - I work at a moderate level fairly steadily.

option - I work at a moderate level and sometimes quite hard and long.

more
intensive

option - I work fairly intensively most of the time, and hard and long at times.

Item 128 asks how many hours during the previous week the respondent used studying for courses.

Student-faculty relationships.--The extent and substance of students' relationships with members of the faculty is of importance to the inquiry into students' out-of-class learning experiences because of the impact of these relationships on the development of students. Four items or sets of items are pertinent. Item 40 requires an estimate of the number of faculty members with whom students have engaged in conversations of five minutes or longer outside class meetings in the previous semester. Item 41 asks the number of conversations with faculty outside class. Item 42 inquires about the number of faculty members the respondents believed knew them quite well and were personally interested in their progress.

Items 53 through 58 and 59 through 64 are alike and yield information about the amount of time spent,

first with the student's advisor (53-58), then with other members of the faculty (59-64), discussing a selection of topics.

Items 53/59: Formal academic arrangements (scheduling, requirements, credits, etc.).

Items 53/60: Questions, ideas, problems concerning your future educational or vocational plans.

Items 55/61: Problems and issues of immediate concern in your personal life (adjustment to academic program, social relations, worries, etc.).

Items 56/62: General topics in the academic field of the faculty member.

Items 57/63: Campus events, activities, issues.

Items 58/64: Other general conversations, either light or serious.

Intellectual exchange in peer relationships.--

The extent and substance of intellectual exchange in students' relationships with their peers makes a significant contribution to their out-of-class learning. Four items give evidence of the importance of this facet of their interaction.

Item 77 calls for an estimate of the amounts of time respondents spent talking with friends about their academic areas of study. Item 82 asks about the importance of intellectual exchange to relationships with best friends of the same sex. Item 93 makes the same inquiry about their relationships with best friends of the opposite sex. Item 104 poses the same question

about the respondents' relationships with the groups of friends with whom they associate most.

Power Syndrome in the Teaching and Learning Process

The Experience of College Questionnaire includes two items which provide information useful in considering what Axelrod called the power syndrome in the teaching and learning process. Item 2 offers respondents the choice of four statements with which to describe the role of the teacher in a course of the student's choice. The options range from a choice representing instructor control, "Teacher dispenses knowledge, or assigns sources, which it is the student's job to master," to the more student participation approach, "Teacher serves mainly as a resource for students, while students have principal responsibility for making and carrying out their own plans."

Item 3 requires an evaluation of student influence over course content and procedures: (1) "not at all"; (2) "in minor respects within a clear structure set by the teacher"; (3) "in some fairly important respects within a general structures set by the teacher"; and (4) "in major aspects of content and/or procedures."

Level of Interest in Courses

Although not a part of Axelrod's model, the level of and motivation for students' interest in their

courses is investigated in the instrument and the resulting data included in this study. Two sets of items are particularly relevant to the degree system and may be considered a response to its dimensions. Students report the frequency with which they were (1) bored, (2) interested and attracted, and (3) challenged to do their best thinking in items 36, 37, and 38 respectively. Item 6 asks the principal reason for the respondent's study for the course of reference. Four of the options represent intrinsic factors of motivation and three are extrinsic.

- Item 6:
1. to have a sense of mastering the material, of doing a job well
 2. to complete a requirement for graduation and to obtain academic credit
 3. to broaden my general knowledge, understanding, or background
 4. to study questions I am concerned about and want to understand better
 5. to get a good grade
 6. to learn something that will be useful vocationally or in other future activities
 7. because it is enjoyable and interesting

Options one, three, four, and seven are considered intrinsic motives while the balance represent motivating forces outside the student.

Influence of Faculty

Finally, the influence of faculty on students was investigated in this study. Ways in which faculty members were perceived as influential to a minor, moderate, or major extent are reported in the frequencies of responses to items 47 through 52.

- Item 47: becoming more open to people and more understanding of them
- Item 48: seeing myself more clearly
- Item 49: increasing my range of feelings, sensitivities, and awareness (aesthetic, social, spiritual)
- Item 50: increasing my sense of purpose and direction
- Item 51: clarifying my values and beliefs
- Item 52: increasing my intellectual competence and/or curiosity

Testable Hypotheses

The structural innovation represented in the calendar change at Colorado College toward an intensive mode was expected to require implemental changes altering substantially the learning-teaching environment. If such changes occurred, they should be reflected in the environment reported by students in their responses to items of the Experience of College Questionnaire.

On the basis of this expectation, the following hypotheses have been formulated regarding comparisons of ECQ data from April, 1970, while the traditional,

semester-length concurrent courses were being offered, and in May, 1972, at the end of the second year of utilizing the nine-block, modular calendar.

Professor and Student Roles in the Classroom

The first three hypotheses explore the first implemental dimension described by Axelrod: the corresponding roles of teachers and learners in the classroom.

Null Hypothesis 1:

In items 23 through 27, no differences will be found between 1970 and 1972 respondents in the amounts of time they reported spending in specified levels of mental activities during class meetings of the course of reference.

Alternative Hypothesis 1:

Students in the 1972 sample will report spending less time taking notes and greater amounts of time in the higher level mental activities during meetings of the course of reference than did students in the 1970 sample.

Null Hypothesis 2:

In items 10, 13, 17, 20, and 21, no differences will be found in the frequencies with which respondents in the 1970 and 1972 samples answered positively the statements descriptive of a student-centered classroom environment in the course of reference.

Alternative Hypothesis 2:

Students in the 1972 sample will choose statements describing a student-centered classroom environment in the course of reference more frequently than students in the 1970 sample.

Null Hypothesis 3:

In items 9, 15, 16, and 19, no differences will be found in the frequencies with which respondents in the 1970 and 1972 samples answered negatively the statements reflecting an information-centered approach in the course of reference.

Alternative Hypothesis 3:

Students in the 1972 sample will answer negatively the statements reflecting an information-centered approach in the course of reference more frequently than did students in the 1970 sample.

Students' Out-of-Class Learning

Axelrod's second implemental dimension, students' out-of-class learning, is divided in this study into three hypotheses dealing with their study patterns, five with respondents' relationships with faculty, and five with the importance of intellectual exchange to the peer environment.

Study BehaviorsNull Hypothesis 4:

In items 28 through 33, no differences will be found between 1970 and 1972 respondents in the amounts of time they reported spending in six levels of study activities while preparing for the course of reference.

Alternative Hypothesis 4:

Students in the 1972 sample will report spending less time memorizing and greater amounts of time in the higher levels of mental activities while preparing for the course of reference than did students in the 1970 sample.

Null Hypothesis 5:

In item 4, no differences will be found between the 1970 and 1972 samples in the frequency with which respondents selected the less intensive pair of options (one and two) and the more intensive pair (three and four) describing their general patterns of study.

Alternative Hypothesis 5:

Students in the 1972 sample will select the pair of statements describing a more intensive general pattern of study more frequently than did students in the 1970 sample.

Null Hypothesis 6:

In item 128, no differences will be found between the 1970 and 1972 respondents in the amounts of time they reported spending during the previous week in study for courses.

Alternative Hypothesis 6:

Students in the 1972 sample will report having spent a greater amount of time studying for courses in the previous week than did students in the 1970 sample.

Student-Faculty InteractionNull Hypothesis 7:

In item 40, no differences will be found between the 1970 and 1972 respondents in the numbers of different faculty members they report having engaged in conversations lasting longer than five minutes outside class meetings.

Alternative Hypothesis 7:

Students in the 1972 sample will report having conversations with more faculty members outside class meetings than did students in the 1970 sample.

Null Hypothesis 8:

In item 41, no differences will be found between the 1970 and 1972 samples in the number of conversations with faculty members reported lasting longer than five minutes outside class meetings.

Alternative Hypothesis 8:

Students in the 1972 sample will report having more conversations lasting longer than five minutes with faculty outside class meetings than did students in 1970.

Null Hypothesis 9:

In item 42, no differences between the two samples will be found in the number of faculty members respondents perceived as knowing them quite well and being personally interested in their progress.

Alternative Hypothesis 9:

Students in the 1972 sample will report a greater number of faculty members know them quite well and are concerned about their progress than did students in the 1970 sample.

Null Hypothesis 10:

In items 53 through 58, no differences between the 1970 and 1972 samples will be found in the amounts of time reported spent with the respondents' academic advisors discussing the six topic options.

Alternative Hypothesis 10:

Students in the 1972 sample will report having spent greater amounts of time discussing the six topic options with their advisors than did those in the 1970 sample.

Null Hypothesis 11:

In items 59 through 64, no differences will be found between the samples in the amounts of time reported spent with faculty (other than academic advisors) discussing the six topic options.

Alternative Hypothesis 11:

Students in the 1972 sample will report having spent greater amounts of time discussing the six topic options with other faculty than did students in the 1970 sample.

Intellectual Exchange in the
Peer EnvironmentNull Hypothesis 12:

In item 77, no differences between samples will be found in the amounts of time respondents reported having spent talking with friends about academic areas of study.

Alternative Hypothesis 12:

Students in the 1972 sample will report having spent greater amounts of time discussing their academic areas of study with friends than did students in the 1970 sample.

Null Hypothesis 13:

In item 82, no differences between samples will be found in the frequencies with which respondents chose the three options describing how much intellectual exchange and challenge was a part of their relationships with their best friends of the same sex.

Alternative Hypothesis 13:

Students in the 1972 sample will describe intellectual exchange and challenge as a more important part of their relationships with their best friends of the same sex than did students in the 1970 sample.

Null Hypothesis 14:

In item 93, no differences will be found between samples in the frequencies with which respondents chose one of three options describing how much intellectual exchange and challenge was a part of their relationships with their best friends of the opposite sex.

Alternative Hypothesis 14:

Students in the 1972 sample will describe intellectual exchange and challenge as a more important part of their relationships with their best friends of the opposite sex than did students in the 1970 sample.

Null Hypothesis 15:

In item 104, no differences will be found between samples in the frequencies with which respondents chose one of three options describing how much intellectual exchange and challenge was a part of their relationship with the groups of friends they associated with most.

Alternative Hypothesis 15:

Students in the 1972 sample will describe intellectual exchange and challenge as a more important part of their relationships with the groups of friends they associate with most than did students in the 1970 sample.

Power Syndrome in the Teaching and Learning Process

Axelrod's third implemental dimension is concerned with the question of how decisions about teaching and learning processes are made.

Null Hypothesis 16:

In item 2, no differences will be found between samples in the proportions selecting options one and two, describing an instructor-controlled classroom environment, and the proportions selecting options three and four, reflective of a situation in which students have a voice in decisions about the learning process.

Alternative Hypothesis 16:

Students in the 1972 sample will choose more frequently the statements describing a student-centered classroom environment and less frequently the options describing an instructor-centered classroom than did students in the 1970 sample.

Null Hypothesis 17:

In item 3, no differences will be found between the 1970 and 1972 samples in the proportions selecting options one and two, little or no student impact on course content and procedures, and options three and four, "fairly important" and "major" impact.

Alternative Hypothesis 17:

Students in the 1972 sample will choose more frequently the options reflecting greater student influence on course content and procedures than did students in the 1970 sample.

Level of Students' Interest
in Courses

There is reason to believe that active participation by students in their own learning produces greater interest in their courses. Two hypotheses explore this possibility.

Null Hypothesis 18:

No differences will be found between the 1970 and 1972 samples in the frequencies with which students report being "bored, uninterested" (item 36), "interested, attracted" (item 37), and "challenged to do your best thinking" (item 38).

Alternative Hypothesis 18:

Students in the 1972 sample will report feeling bored and uninterested in their courses less often and interested and attracted and challenged in their courses more often than did students in the 1970 sample.

Null Hypothesis 19:

In item 6, no differences will be found between the two samples in the frequencies with which students will select options one, three, four, and seven--descriptive of intrinsic motives for study and options two, five, and six--reflecting extrinsic motivations.

Alternative Hypothesis 19:

Students in the 1972 sample will choose statements describing intrinsic motives for study more often and statements that reflect extrinsic motives less often than did students in the 1970 sample.

Influence of Faculty

If broader relationships between students and faculty are cultivated by the implemental dimensions of the degree system, it is possible that students will perceive faculty to have greater influence. The final hypothesis of the study deals with that issue.

Null Hypothesis 20:

In items 47 through 52, no differences between the 1970 and 1972 samples will be found in the amount of influence attributed to faculty in the six vectors of change.

Alternative Hypothesis 20:

Students in the 1972 sample will attribute greater influence to faculty in the six vectors of change than did students in the 1970 sample.

Analysis Procedures

The frequency of responses during the 1970 ECQ administration to each of the fifty-two items included in the twenty hypotheses above was compared to the

corresponding frequencies for 1972 responses to determine if significant differences exist. The chi-square test for homogeneity, which assumes random sampling and normality of the sampling distribution, was used in the comparison for all except one of the items. In one item, where discreet intervals of equal size were used in the questionnaire, the t-ratio testing statistical significance of mean differences was used.

Several items on the instrument include four to six response options. This makes comparison of the data with the chi square test particularly difficult since the resulting contingency table involves a number of cells that is difficult to interpret. In these instances, intervals were combined to reduce the number of cells in the contingency table.

Following the computation of chi square values, post-test comparisons were made on items where significant differences were discovered. By the process of comparing actual frequencies with expected frequencies, the direction of the differences could be ascertained.

Summary

In 1970, while Colorado College still followed a traditional semester calendar with concurrent courses, a random sample of 222 students completed the Experience of College Questionnaire including an evaluation of their academic experiences and activities, relationships

with faculty, relationships with their peers, and participation in extra-curricular activities. Two years later, after the adoption of a nine-block modular calendar featuring intensive, one-at-a-time courses, a random sample of 258 Colorado College students completed the ECQ instrument.

Comparison of the data between the two samples focused on five areas--classroom roles of faculty and students, students' out-of-class learning experiences, the power syndrome in the teaching and learning process, the level of students' interest in their courses, and the influence of faculty on students.

Twenty null hypotheses were constructed involving the data from fifty-two items of the questionnaire and divided among the areas of concern, as outlined above, to this study.

The chi-square test for homogeneity was used to determine if differences in the frequencies of responses existed between the two samples in every item except one. In that item, discreet intervals of equal size were used in the instrument making it possible to compare the means using the t-ratio. A post-test analysis was necessary to determine the directions of differences that were discovered.

CHAPTER IV

ANALYSIS OF RESULTS

Introduction

In this chapter, the twenty hypotheses are restated, data relevant to each are cited, probability statements for acceptance are given, and the decisions reported. A discussion of the results follows the report providing post-test comparisons.

Results from Testing of Hypotheses

The hypotheses of this study are divided into five subject areas. The first three subjects correspond to the three implemental dimensions of the degree system as Axelrod described it: (1) professor and student roles in the classroom; (2) students' out-of-class learning experiences including study behaviors, student-faculty relationships, and the importance of intellectual exchange in peer relationships; and (3) the power syndrome in the teaching and learning process.

Professor and Student Roles in the Classroom

The first three hypotheses are related to the possibility of differences between samples in the roles of faculty and students in the classroom.

Null Hypothesis 1:

In items 23, 24, 25, and 26, no differences will be found between 1970 and 1972 respondents in the amounts of time they reported spending in specified levels of mental activities during class meetings of the course of reference.

Alternative Hypothesis 1:

1972 respondents will report spending less time during class listening and taking notes (item 23) and more time doing their own thinking about the ideas presented (item 24), actively working at desk problems (item 25), and participating in class discussion (item 26) than did students in the 1970 sample.

Decision rule: Using .05 as the confidence level with two degrees of freedom, reject the null-hypothesis when the chi square value is greater than 5.991.

Item 23: percentage of class time in the course of reference spent listening and taking notes

	0-20%	21-80%	81% or more
f/1970 ¹	32	109	80
ef/1972 ²	35.83	110.27	74.91
f/1972	45	128	81
ef/1972	41.17	126.73	86.09

¹In the reporting of results, "f" refers to the actual frequency of respondents in each sample choosing the option noted.

²The symbol "ef" refers to the expected frequency derived through computation of the chi square statistic.

Decision: Chi square equals 1.4385; do not reject the null hypothesis.

Item 24: percentage of class time in the course of reference spent doing your own thinking, analyzing

	0-20%	21-80%	81% or more
f/1970	122	87	13
ef/1970	112.17	90.67	19.16
f/1972	118	107	28
ef/1972	127.83	103.33	21.84

Decision: Chi square equals 5.617; do not reject the null hypothesis.

Item 25: percentage of class time spent actively working at desk problems or lab tasks

	0-20%	21-80%	81% or more
f/1970	187	21	5
ef/1970	173.44	31.29	8.28
f/1972	190	47	13
ef/1972	203.56	36.72	9.72

Decision: Chi square equals 10.63; reject the null hypothesis.

Item 26: percentage of class time spent participating in class discussions, making statements to the class

	0-5%	6-50%	51% or more
f/1970	116	86	17
ef/1970	95.58	102.08	21.34
f/1972	90	134	29
ef/1972	110.42	117.92	24.66

Decision: Chi square equals 14.51; reject the null hypothesis.

Null Hypothesis 2:

In items 10, 13, 17, 20, and 21, no differences will be found in the frequencies with which students in the 1970 and 1972 samples answered positively the statements descriptive of a student-centered classroom environment in the course of reference.

Alternative Hypothesis 2:

Students in the 1972 sample will choose statements describing a student-centered classroom environment more frequently than students in the 1970 sample.

Decision rule: Using .05 as the confidence level with one degree of freedom, reject the null hypothesis in items 10, 13, 17, 20, and 21 when the chi square value is greater than 3.841.

Item 10: The teacher encourages class discussion.

	applies	does not apply
f/1970	152	70
ef/1970	164.65	57.35
f/1972	204	54
ef/1972	191.35	66.65

Decision: Chi square equals 6.999; reject the null hypothesis.

Item 13: The teacher knows my name.

	applies	does not apply
f/1970	174	48
ef/1970	187.14	34.86
f/1972	234	28
ef/1972	220.86	41.14

Decision: Chi square equals 10.86; reject the null hypothesis.

Item 17: Examinations are usually of the essay type.

	applies	does not apply
f/1970	133	85
ef/1970	113.82	104.18
f/1972	115	142
ef/1972	134.18	122.82

Decision: Chi square equals 12.5; reject the null hypothesis.

Item 20: I sometimes argue openly with the teacher.

	applies	does not apply
f/1970	66	155
ef/1970	88.58	132.42
f/1972	126	132
ef/1972	103.42	154.58

Decision: Chi square equals 17.84; reject the null hypothesis.

Item 21: I sometimes argue openly with other students in the class.

	applies	does not apply
f/1970	76	146
ef/1970	103.6	118.4
f/1972	148	110
ef/1972	120.4	137.6

Decision: Chi square equals 25.649; reject the null hypothesis.

Null Hypothesis 3:

In items 9, 15, 16, and 19, no differences will be found in the frequencies with which respondents in the 1970 and 1972 samples answered the statements reflecting an information-centered approach in the course of reference.

Alternative Hypothesis 3:

Students in the 1972 sample will answer negatively the statements reflecting an information-centered approach in the course of reference more frequently than did students in the 1970 sample.

Decision rule: Using .05 as the confidence level with one degree of freedom, reject the null hypothesis in items 9, 15, 16, and 19 when the chi square value is greater than 3.841.

Item 9: Lectures follow the textbook.

	applies	does not apply
f/1970	90	131
ef/1970	83.97	137.03
f/1972	92	166
ef/1972	98.03	159.97

Decision: Chi square equals 1.296; do not reject the null hypothesis.

Item 15: We sometimes have unannounced quizzes.

	applies	does not apply
f/1970	10	212
ef/1970	6.94	215.06
f/1972	5	253
ef/1972	8.06	249.94

Decision: Chi square equals 2.596; do not reject the null hypothesis.

Item 16: Examinations are usually of the objective type.

	applies	does not apply
f/1970	45	174
ef/1970	39.03	179.97
f/1972	40	218
ef/1972	45.97	212.03

Decision: Chi square equals 2.058; do not reject the null hypothesis.

Item 19: I almost never speak in class unless called on.

	applies	does not apply
f/1970	95	127
ef/1970	71.69	150.31
f/1972	60	198
ef/1972	83.31	174.69

Decision: Chi square equals 20.831; reject the null hypothesis.

Students' Out-of-Class Learning

The second series of hypotheses and the corresponding tests deal with the second implemental dimension described by Axelrod, students' learning experiences outside class. In this study, the areas of concern are study behaviors, students' relationships with faculty, and the importance of intellectual exchange in the peer environment.

Study Behaviors

Null Hypothesis 4:

In items 28, 29, 30, 31, 32, and 33, no differences will be found between 1970 and 1972 respondents in the amounts of time they reported spending in six levels of study activities while preparing for the course of reference.

Alternative Hypothesis 4:

Students in the 1972 sample will report spending less time memorizing and greater amounts of time in the higher level mental activities (interpreting, item 29; applying, item 30; analyzing, item 31; synthesizing, item 32; and evaluating, item 33) while preparing for the course of reference than did students in the 1970 sample.

Decision rule: Using .05 as the confidence level with two degrees of freedom, reject the null hypothesis in items 28 through 33 when the chi square value is greater than 5.991.

Item 28: percentage of study time spent memorizing--learning specific things so you can remember them as first encountered.

	0-20%	21-80%	81% or more
f/1970	123	68	29
ef/1970	131.16	63.72	21.12
f/1972	159	69	25
ef/1972	150.84	73.28	28.88

Decision: Chi square equals 2.610; do not reject the null hypothesis.

Item 29: percentage of study time spent interpreting--making inferences, extension of principles

	0-20%	21-80%	81% or more
f/1970	109	103	8
ef/1970	110.92	96.13	12.94
f/1972	131	105	20
ef/1972	129.08	111.87	15.06

Decision: Chi square equals 4.482; do not reject the null hypothesis.

Item 30: percentage of study time spent applying concepts to new problems or situations

	0-20%	21-80%	81% or more
f/1970	154	61	5
ef/1970	135.88	53.49	10.63
f/1972	140	98	18
ef/1972	158.12	85.51	12.37

Decision: Chi square equals 13.981; reject the null hypothesis.

Item 31: percentage of study time spent analyzing material into parts, detecting relationships and organization

	0-20%	21-80%	81% or more
f/1970	137	75	6
ef/1970	123.98	81.58	12.44
f/1972	132	102	21
ef/1972	145.02	95.42	14.56

Decision: Chi square equals 9.71; reject the null hypothesis.

Item 32: percentage of study time spent synthesizing ideas into new plans, relationships

	0-20%	21-80%	81% or more
f/1970	167	49	4
ef/1970	146.51	63.32	10.17
f/1972	150	88	18
ef/1972	170.49	73.68	11.83
Decision:	Chi square equals 18.304; reject the null hypothesis.		
Item 33:	percentage of study time spent evaluating--making judgments about the value of materials, and evidence		

	0-20%	21-80%	81% or more
f/1970	134	73	12
ef/1970	128.63	76.07	14.29
f/1972	145	92	19
ef/1972	150.37	88.93	16.71
Decision:	Chi square equals 1.328; do not reject the null hypothesis.		

Null Hypothesis 5:

In item 4, no differences will be found between the 1970 and 1972 samples in the frequency with which respondents selected the less intensive pair of options (one and two) and the more intensive pair (three and four) describing their general patterns of study.

Alternative Hypothesis 5:

Students in the 1972 sample will select the pair of statements describing a more intensive general pattern of study more frequently than did students in the 1970 sample.

Decision rule: Using .05 as the confidence level with one degree of freedom, reject the null hypothesis when the chi square value is greater than 3.841.

	less intensive	more intensive
f/1970	148	74
ef/1970	113.78	108.23
f/1972	98	160
ef/1972	132.23	125.78

Decision: Chi square equals 39.29; reject the null hypothesis.

Null Hypothesis 6:

In item 128, no differences will be found between the 1970 and 1972 respondents in the amounts of time they reported spending during the previous week in study for courses.

Alternative Hypothesis 6:

Students in the 1972 sample will report having spent a greater amount of time studying for courses in the previous week than did students in the 1970 sample.

Decision rule: Using .05 as the confidence level with 477 degrees of freedom, reject the null hypothesis when the t-value is greater than 1.645.

Item 128: How many hours during the past week did you spend studying for courses taken for credit?

	0-9	10-19	20-29	30-39	40-49
f/1970	33	82	54	38	15
f/1972	62	74	66	28	27
1970 mean--	20.896		1972 mean--19.986		

Decision: The t-value equals .82648; do not reject the null hypothesis.

Student Faculty Relationships

Null Hypothesis 7:

In item 40, no differences will be found between the 1970 and 1972 respondents in the number of different faculty members they report having engaged in conversations lasting longer than five minutes outside class meetings during the present semester.

Alternative Hypothesis 7:

Students in the 1972 sample will report having had conversations with more faculty members outside class meetings than did students in the 1970 sample.

Decision rule: Using .05 as the confidence level with two degrees of freedom, reject the null hypothesis when the chi square value is greater than 5.991.

Item 40: During the present semester, how many different individual members of the faculty have you talked with for more than five minutes outside of a class meeting?

	0-2	3-10	11 or more
f/1970	61	130	31
ef/1970	55.96	137.825	28.213
f/1972	60	168	30
ef/1972	65.04	160.18	32.79

Decision: Chi square equals 2.182; do not reject the null hypothesis.

Null Hypothesis 8:

In item 41, no differences will be found between the 1970 and 1972 samples in the number of conversations with faculty members reported lasting longer than five minutes outside class meetings.

Alternative Hypothesis 8:

Students in the 1972 sample will report having more conversations lasting longer than five minutes with faculty outside class meetings than did students in 1970.

Decision rule: Using .05 as the confidence level with two degrees of freedom, reject the null hypothesis when the chi square value is greater than 5.991.

Item 41: During the present semester, how many conversations have you had lasting more than five minutes with faculty outside of a class meeting?

	0-2	3-10	11 or more
f/1970	73	97	52
ef/1970	69.84	99.9	52.26
f/1972	78	119	61
ef/1972	81.16	116.1	60.74

Decision: Chi square equals .4255; do not reject the null hypothesis.

Null Hypothesis 9:

In item 42, no differences will be found between samples in the number of faculty members respondents perceived as knowing them quite well and being personally interested in their progress.

Alternative Hypothesis 9:

Students in the 1972 sample will report a greater number of faculty members know them quite well and are concerned about their progress than did students in the 1970 sample.

Decision rule: Using .05 as the confidence level, with two degrees of freedom, reject the null hypothesis when the chi square value is greater than 5.991.

Item 42: How many members of the faculty know you quite well and are personally interested in how you are getting along?

	0-2	3-10	11 or more
f/1970	119	97	6
ef/1970	113.31	100.36	8.33
f/1972	126	120	12
ef/1972	131.69	116.64	9.68

Decision: Chi square equals 1.949; do not reject the null hypothesis.

Null Hypothesis 10:

In items 53, 54, 55, 56, 57, and 58, no differences will be found between the 1970 and 1972 samples in the amounts of time reported spent with the respondents' academic advisors discussing the six topic options.

Alternative Hypothesis 10:

Students in the 1972 sample will report having spent greater amounts of time discussing the six topic options with their advisors than did those in the 1970 sample.

Decision rule: Using .05 as the confidence level with two degrees of freedom, reject the null hypothesis when the chi square value is greater than 5.991.

Item 53: How much time during the present semester have you spent with your advisor talking about formal academic arrangements?

	none	some, but less than 1 hr.	more than 1 hour
f/1970	7	178	37
ef/1970	10.64	183.61	27.76
f/1972	16	219	23
ef/1972	12.36	213.39	32.25

Decision: Chi square equals 8.37; reject the null hypothesis.

Item 54: How much time have you spent with your advisor talking about future educational or vocational plans?

	none	some, but less than 1 hr.	more than 1 hour
f/1970	48	147	27
ef/1970	47.18	148.46	26.36
f/1972	54	174	30
ef/1972	54.83	172.54	30.64

Decision: Chi square equals .00082; do not reject the null hypothesis.

Item 55: How much time have you spent with your advisor talking about problems and issues of concern in your personal life?

	none	some, but less than 1 hr.	more than 1 hour
f/1970	129	80	13
ef/1970	133.66	79.09	9.3
f/1972	160	91	7
ef/1972	155.34	91.91	10.75

Decision: Chi square equals 3.15; do not reject the null hypothesis.

Item 56: How much time have you spent with your advisor talking about general topics in his academic field?

	none	some, but less than 1 hr.	more than 1 hour
f/1970	79	118	25
ef/1970	70.45	125.6	25.95
f/1972	73	153	31
ef/1972	81.55	145.4	30.05
Decision:	Chi square equals 2.857; do not reject the null hypothesis.		

Item 57: How much time have you spent with your advisor talking about campus events and issues?

	none	some, but less than 1 hr.	more than 1 hour
f/1970	108	101	12
ef/1970	114.88	95.04	11.07
f/1972	141	105	12
ef/1972	134.12	110.96	12.93
Decision:	Chi square equals 1.603; do not reject the null hypothesis.		

Item 58: How much time have you spent with your advisor in other general conversations?

	none	some, but less than 1 hr.	more than 1 hour
f/1970	60	129	31
ef/1970	57.53	133.93	28.54
f/1972	65	162	31
ef/1972	67.47	157.07	33.46
Decision:	Chi square equals .9272; do not reject the null hypothesis.		

Null Hypothesis 11:

In items 59 through 64, no differences will be found between the samples in the amounts of time reported spent with faculty other than academic advisors discussing the six topic options.

Alternative Hypothesis 11:

Students in the 1972 sample will report having spent greater amounts of time discussing the six topic options with other faculty members than did students in the 1970 sample.

Decision rule: Using .05 as the confidence level with two degrees of freedom, reject the null hypothesis when the chi square value is greater than 5.991.

Item 59: How much time have you spent with other faculty members discussing formal academic arrangements?

	none	some, but less than 1 hr.	more than 1 hour
f/1970	47	161	14
ef/1970	53.76	154.33	13.9
f/1972	69	172	16
ef/1972	62.24	178.67	16.1

Decision: Chi square equals 2.123; do not reject the null hypothesis.

Item 60: How much time have you spent with other faculty members discussing future educational and vocational plans?

	none	some, but less than 1 hr.	more than 1 hour
f/1970	61	134	27
ef/1970	61.05	135.98	24.98
f/1972	71	160	27
ef/1972	70.96	158.03	29.03

Decision: Chi square equals .3589; do not reject the null hypothesis.

Item 61: How much time have you spent with other faculty members discussing problems and issues in your personal life?

	none	some, but less than 1 hr.	more than 1 hour
f/1970	123	79	20
ef/1970	120.25	83.71	18.04
f/1972	137	102	19
ef/1972	139.75	97.29	20.96

Decision: Chi square equals 1.007; do not reject the null hypothesis.

Item 62: How much time have you spent with other faculty discussing general topics in his academic field?

	none	some, but less than 1 hr.	more than 1 hour
f/1970	54	123	45
ef/1970	50.41	127.65	43.94
f/1972	55	153	50
ef/1972	58.59	148.35	51.06

Decision: Chi square equals .8379; do not reject the null hypothesis.

Item 63: How much time have you spent with other faculty discussing campus events and issues?

	none	some, but less than 1 hr.	more than 1 hour
f/1970	65	123	33
ef/1970	73.82	116.27	30.91
f/1972	95	129	34
ef/1972	86.18	135.73	36.09
Decision:	Chi square equals 2.942; do not reject the null hypothesis.		
Item 64:	How much time have you spent with other faculty in general conversations?		

	none	some, but less than 1 hr.	more than 1 hour
f/1970	54	102	60
ef/1970	48.41	106.14	61.45
f/1972	50	126	72
ef/1972	55.59	121.86	70.55
Decision:	Chi square equals 1.572; do not reject the null hypothesis.		

Intellectual Exchange in the Peer Environment

Null Hypothesis 12:

In item 77, no differences between samples will be found in the amounts of time respondents reported having spent talking with friends about academic areas of study.

Alternative Hypothesis 12:

Students in the 1972 sample will report having spent greater amounts of time discussing their academic areas of study with friends than did students in the 1970 sample.

Decision rule: Using .05 as the confidence level with two degrees of freedom, reject the null hypothesis when chi square is greater than 5.991.

Item 77: How much time have you spent during the past week talking with friends about general topics in academic areas of study?

	none	one hour or less	more than one hour
f/1970	7	147	67
ef/1970	6.93	142.4	71.66
f/1972	8	161	88
ef/1972	8.06	165.6	83.34

Decision: Chi square equals .8417; do not reject the null hypothesis.

Null Hypothesis 13:

In item 82, no differences between samples will be found in the frequencies with which respondents chose the three options describing how much intellectual exchange and challenge was a part of their relationships with their best friends of the same sex.

Alternative Hypothesis 13:

Students in the 1972 sample will describe intellectual exchange and challenge as important to their relationships with their best friends of the same sex to a moderate and major extent more often than students in the 1970 sample.

Decision rule: Using .05 as the confidence level with two degrees of freedom, reject the null hypothesis when chi square is greater than 5.991.

Item 82: How much a part of your relationship with your best friend of the same sex is intellectual exchange and challenge?

	minor	moderate	major
f/1970	47	97	73
ef/1970	41.84	106.66	68.5
f/1972	44	135	76
ef/1972	49.16	125.34	80.5

Decision: Chi square equals 3.346; do not reject the null hypothesis.

Null Hypothesis 14:

In item 93, no differences will be found between samples in the frequencies with which respondents chose one of the three options describing how much intellectual exchange and challenge was a part of their relationships with their best friend of the opposite sex?

Alternative Hypothesis 14:

Students in the 1972 sample will choose the "moderate" and "major" options in describing the extent to which intellectual exchange and challenge is a part of their relationships with their best friends of the opposite sex more often than students in the 1970 sample.

Decision rule: Using .05 as the confidence level with two degrees of freedom, reject the null hypothesis when chi square is greater than 5.991.

Item 93: How much a part of your relationship with your best friend of the opposite sex is intellectual exchange and challenge?

	minor	moderate	major
f/1970	60	92	62
ef/1970	56.34	94.96	62.7
f/1972	64	117	76
ef/1972	67.67	114.04	75.3

Decision: Chi square equals .6192; do not reject the null hypothesis.

Null Hypothesis 15:

In item 104, no differences will be found between samples in the frequencies with which respondents chose one of three options describing how much intellectual exchange and challenge was a part of their relationship with the groups of friends they associated with most.

Alternative Hypothesis 15:

Students in the 1972 sample will choose the "moderate" and "major" options in describing the extent to which intellectual exchange and challenge is a part of their relationships with the groups of friends they associated with most more often than students in the 1970 sample.

Decision rule: Using .05 as the confidence level with two degrees of freedom, reject the null hypothesis when chi square is greater than 5.991.

Item 104: How much a part of your relationship with the group of students with whom you most closely associate is intellectual exchange and challenge?

	minor	moderate	major
f/1970	47	118	52
ef/1970	50.92	116.07	50.01
f/1972	64	135	57
ef/1972	60.08	136.93	58.99

Decision: Chi square equals .7648; do not reject the null hypothesis.

Power Syndrome in the Teaching
and Learning Process

Hypotheses 16 and 17 provide definition of the authority for decision making in the educational process, a dimension Axelrod called the power "syndrome."

Null Hypothesis 16:

In item 2, no differences will be found between samples in the proportions selecting options one and two, describing a classroom environment in which the instructor retained authority for all decisions, and the proportions selecting options three and four, reflecting a situation in which these experiences were shared with students.

Alternative Hypothesis 16:

Students in the 1972 sample will choose more frequently the statements describing a student-centered classroom environment than did students in the 1970 sample.

Decision rule: Using .05 as the confidence level with one degree of freedom, reject the null hypothesis when chi square is greater than 3.841.

Item 2: Which statement most nearly describes the role of the teacher?

	options 1 & 2 instructor-centered	options 3 & 4 student-centered
f/1970	167	54
ef/1970	157.06	63.94
f/1972	172	84
ef/1972	181.94	74.06

Decision: Chi square equals 4.05; reject the null hypothesis.

Null Hypothesis 17:

In item 3, no differences will be found between the 1970 and 1972 samples in the proportions selecting options one and two, little or no student impact on course content and procedures, and options three and four, "fairly important" and "major" impact.

Alternative Hypothesis 17:

Students in the 1972 sample will choose more frequently the options reflecting greater student influence on course content and procedures than did students in the 1970 sample.

Decision rule: Using .05 as the confidence level with one degree of freedom, reject the null hypothesis when chi square is greater than 3.841.

Item 3: How much do students in this course influence content or procedures?

	not at all/minor options 1 & 2	fairly important/major options 3 & 4
f/1970	169	53
ef/1970	169.95	61.05
f/1972	179	79
ef/1972	187.05	70.95

Decision: Chi square equals 2.7239; do not reject the null hypothesis.

Level of Interest in Courses

Hypotheses 18 and 19 are not directly associated with Axelrod's model of the degree system. They are concerned with the level of students' expressed interest in their courses and the motivation for that interest.

Null Hypothesis 18:

No differences will be found between the 1970 and 1972 samples in the frequencies with which students report being "bored, uninterested" (item 36), "interested, attracted" (item 37), and "challenged to do your best thinking" (item 38).

Alternative Hypothesis 18:

Students in the 1972 sample will report feeling bored and uninterested in their courses less often and interested and attracted and challenged in their courses more often than will students in the 1970 sample.

Decision rule: Using .05 as the confidence level with one degree of freedom, reject the null hypothesis when chi square is greater than 3.841.

Item 36: How often have you felt bored, uninterested in this course?

	rarely/ occasionally	frequently/ most of the time
f/1970	160	61
ef/1970	175.23	45.77
f/1972	219	38
ef/1972	203.77	53.23

Decision: Chi square equals 11.884; reject the null hypothesis.

Item 37: How often have you felt interested and attracted by this course?

	rarely/ occasionally	frequently/ most of the time
f/1970	71	149
ef/1970	59.5	160.5
f/1972	58	199
ef/1972	69.5	187.5

Decision: Chi square equals 5.658; reject the null hypothesis.

Item 38: How often have you felt challenged to do your best thinking in this course?

	rarely/ occasionally	frequently/ most of the time
f/1970	129	91
ef/1970	113.47	106.53
f/1972	116	139
ef/1972	131.53	123.47

Decision: Chi square equals 8.173; reject the null hypothesis.

Null Hypothesis 19:

In item 6, no differences will be found between the two samples in the frequencies with which students will select options one, three, four, and seven--descriptive of intrinsic motives for study--and options two, five, and six--reflecting extrinsic motivations.

Alternative Hypothesis 19:

Students in the 1972 sample will choose statements describing intrinsic motives for study more often and statements that reflect extrinsic motives less often than did students in the 1970 sample.

Item 6 (intrinsic motives)

Decision rule: Using .05 as the confidence level with three degrees of freedom, reject the null hypothesis when chi square is greater than 7.814.

	option 1	option 3	option 4	option 7
f/1970	18	72	17	42
ef/1970	26.42	69.74	22.09	30.75
f/1972	43	89	34	29
ef/1972	34.58	91.26	28.91	40.25

Decision: Chi square equals 14.19; reject the null hypothesis.

Item 6 (extrinsic motives)

	option 2	option 5	option 6
f/1970	41	9	23
ef/1970	41.64	5.95	25.41
f/1972	36	2	24
ef/1972	35.36	5.05	21.59

Decision: Chi square equals 3.93; do not reject the null hypothesis.

Influence of Faculty

The degree to which students perceive they have been influenced by faculty members, like the level of students' interest in their courses, is not a dimension of Axelrod's model. The influence of faculty, though, may be shaped by characteristics of the degree system and the 20th hypothesis is related to that possibility.

Null Hypothesis 20:

In items 47, 48, 49, 50, 51, and 52, no differences between the 1970 and 1972 samples will be found in the amount of influence attributed to faculty in the six vectors of change.

Alternative Hypothesis 20:

Students in the 1972 sample will attribute greater influence to faculty in the six vectors of change than did students in the 1970 sample.

Decision rule: Using .05 as the confidence level with two degrees of freedom, reject the null hypothesis when chi square is greater than 5.991.

Item 47: How much have you been influenced by
faculty in becoming more open to people
and understanding?

	minor	moderate	major
f/1970	123	75	23
ef/1970	128.53	67.5	24.97
f/1972	155	71	31
ef/1972	149.47	78.5	29.03

Decision: Chi square equals 2.279; do not reject
the null hypothesis.

Item 48: How much have you been influenced by
faculty in seeing yourself more clearly?

	minor	moderate	major
f/1970	110	82	29
ef/1970	106.12	85.82	29.07
f/1972	120	104	34
ef/1972	123.88	100.18	33.93

Decision: Chi square equals .5792; do not reject
the null hypothesis.

Item 49: How much have you been influenced by
faculty in increasing your range of
feelings, sensitivities, and awareness?

	minor	moderate	major
f/1970	99	80	43
ef/1970	104.06	77.7	40.24
f/1972	126	88	44
ef/1972	120.94	90.3	46.76

Decision: Chi square equals .9377; do not reject
the null hypothesis.

Item 50: How much have you been influenced by
faculty in increasing your sense of
purpose?

	minor	moderate	major
f/1970	83	87	51
ef/1970	76.29	93.39	51.32
f/1972	82	115	60
ef/1972	88.71	108.61	59.68

Decision: Chi square equals 1.917; do not reject
the null hypothesis.

Item 51: How much have you been influenced by
faculty in clarifying your values and
beliefs?

	minor	moderate	major
f/1970	112	84	25
ef/1970	111.19	83.97	25.84
f/1972	129	98	31
ef/1972	129.8	98.03	30.16

Decision: Chi square equals .0061; do not reject
the null hypothesis.

Item 52: How much have you been influenced by
faculty in increasing your intellectual
competence or curiosity?

	minor	moderate	major
f/1970	37	91	93
ef/1970	35.99	83.97	101.04
f/1972	41	91	126
ef/1972	42.01	98.03	117.96

Decision: Chi square equals 2.334; do not reject
the null hypothesis.

Discussion

In chi square tests where the null hypotheses have been rejected, the investigator has the assurance only that there are significant differences in the observed frequencies of the two samples. Post-test comparisons are necessary in order to determine the direction of the differences. In the discussion that follows, those tests resulting in the rejection of the null hypothesis are further analyzed to determine the meaning of the differences and whether the alternate hypothesis may be accepted.

Classroom Roles of Faculty and Students

Hypothesis 1: Four items in which respondents were asked to estimate the amount of class time devoted to specific learning activities were related to this hypothesis. Two tests indicate significant differences, each in the direction posited by the alternate hypothesis. In item 25, percentage of class time devoted to actively working at desk problems or lab tasks, the observed 1972 frequency in the lowest quintile is below the expected frequency and the observed frequencies are above those expected for the upper four quintiles.

The same pattern is revealed in inspecting the data in item 26, percentage of class time spent participating in class discussions. Students in the 1972

sample chose the higher intervals to describe the amount of discussion in their classes more often than did students in the 1970 sample.

The differences in items 25 and 26 were congruent with those suggested in the alternate hypothesis. Tests of two other items related to the first hypothesis, however, failed to reveal significant differences. Those items were item 23, percentage of class time spent listening and taking notes, and item 24, percentage of class time spent doing your own thinking.

Hypothesis 2: Items 10, 13, 17, 20, and 21 were ones in which the positive response, "applies" was taken as an indication of a classroom environment in which the student was an active participant. The null hypothesis was rejected in each case. In all items except one, "Examinations are usually of the 'essay' type" (item 17), comparison of the differences resulted in support of the alternate hypothesis that students in 1972 would respond positively with greater frequency than those in 1970. In item 17, students in the 1970 sample responded "applies" more often than those in 1972.

Hypothesis 3: The four items associated with the third hypothesis were ones in which a positive response was viewed as indicative of a classroom situation that was instructor centered. Only one

item of the four showed a significant difference when tested. That was item 19, "I almost never speak unless called on," in which students in the 1972 sample opted "does not apply" more often than expected, given the 1970 frequencies.

Students' Out-of-Class Learning

Hypothesis 4: Six items asking for estimates of study time devoted to six learning activities were associated with the fourth hypothesis. Only the test of differences in item 32, percentage of study time spent synthesizing ideas into new plans and relationships, reached significance. In this item, the 1972 sample reported percentages in the highest four quantiles more frequently than expected, lending support for the alternate hypothesis.

Hypothesis 5: In item 4 of the questionnaire, students were offered four options to describe the intensity of their general patterns of study. As posited by the alternate hypothesis, respondents in the 1972 sample selected the pair of options describing a more intense study pattern more frequently than those in the 1970 group.

Hypothesis 10: The tenth hypothesis dealt with the amount of time respondents reported having spent with their advisors during that semester discussing six specific topics. Only one topic option, formal

academic arrangements (item 53), established significant differences and those differences were opposite to the prediction of the alternate hypothesis. Students in the 1970 sample chose the higher percentage of time intervals more frequently than did students in the 1972 sample.

Power Syndrome in the Teaching and Learning Process

Hypothesis 16: In item 2, students were offered four choices of statements describing the role of the teacher in the course of reference. Two choices reflected a classroom environment in which the instructor retained most of the authority over learning activities and two were descriptive of a classroom in which the instructor worked together with students. The 1972 sample chose the instructor-centered statements more often than those in the previous administration of the questionnaire.

Level of Interest in Courses

Hypothesis 18: All three items related to the eighteenth hypothesis showed significant differences and, in each case, the differences were in the direction suggested by the alternate hypothesis. The 1972 sample reported feeling "bored, uninterested" in their courses less frequently than those in 1970 (item 36). The 1972 respondents were more frequently "interested,

attracted" (item 37) by their courses and "challenged to do your best thinking" (item 38) than those questioned in 1970.

Hypothesis 19: Item 6 offered students seven choices with which to describe their principal reasons for study related to their courses of reference. Four of those options were intrinsic in their origins and three were extrinsic. The pattern of responses in the two samples to the statements of intrinsic motivation revealed statistically significant differences, but the directions were mixed. Students in 1972 chose "to have a sense of mastering the material" and "to study questions of concern" more often than the 1970 sample. However, the reverse was true on the items "to broaden my general knowledge" and "because it is enjoyable."

Summary

The twenty hypotheses around which this study is organized were divided into five groups. The first three groups of hypotheses parallel Axelrod's structural dimensions of the degree system as discussed in Chapter I:

- (1) professor and student roles in the classroom;
- (2) students out-of-class learning, a group subdivided into study behaviors, interaction between faculty and students, and the importance of intellectual exchange

in the peer environment; and (3) the power syndrome in the teaching and learning process.

The latter two groups of hypotheses may be regarded as outcomes of the degree system: (4) level of students' interest in their courses and (5) the influence of faculty.

The comparison of data from the 1970 and 1972 administrations of the Experience of College Questionnaire associated with the first hypothesis failed to reveal any differences in the amounts of time during classes students in the two samples spent listening and taking notes (item 23). However, students in the 1972 sample did report spending more time in their classes "actively working at desk problems or lab tasks" (item 25) and more time participating in class discussions or making statements to the class (item 26).

Each of the items related to the second hypothesis yielded significant differences between the samples. Students in the 1972 sample answered positively more frequently than those in the 1970 group the following statements: "The teacher encourages class discussion" (item 10); "The teacher knows my name" (item 13); "I sometimes argue openly with the teacher" (item 20); "I sometimes argue openly with other students in the class" (item 21). The data for item 17, "Examinations are usually of the essay type," showed statistically

significant differences, too, but not in the direction of the alternate hypothesis. Students in the 1970 sample answered that statement positively more frequently than did those in 1972.

Given these results, it should be anticipated that students in the 1972 sample would answer negatively the similar items grouped with the third hypothesis which reflected an information-centered approach in the course of reference. Only one item, however, "I almost never speak unless called on" (item 19), provided statistically significant results supporting the alternative hypothesis.

The fourth, fifth, and sixth hypotheses were related to study behaviors as a part of students' out-of-class learning. The six questionnaire items considered in the fourth hypothesis asked respondents to estimate the amount of their study time devoted to six mental activities: memorizing, interpreting, applying, analyzing, synthesizing, and evaluating. No significant differences were discovered between samples in the percentages of time estimated to have been spent memorizing, interpreting, or evaluating. There were differences in the estimates for applying concepts to new problems or situations (item 30), analyzing material into parts and detecting relationships and organization (item 31), and synthesizing ideas into

new plans and relationships (item 32). Each of the significant differences was congruent with the alternate hypotheses that more students in the 1972 sample would indicate higher percentages of time allocated to these study activities than students in 1970.

Item 4 was considered in the fifth hypothesis. As predicted in the alternate, students in the 1972 sample did describe their general patterns of study as intensive more frequently than those in 1970. However, in item 128--the subject of the sixth hypothesis, no significant differences were found between samples in the number of hours respondents studied for courses during the previous week.

Hypotheses 7 through 11 explored the degree and scope of students' interaction with faculty. Hypothesis 7 was concerned with the number of different individual members of the faculty with whom students had engaged in conversations of five minutes or longer apart from a class meeting (item 40). No differences between samples were found, the same result discovered when students were asked, in connection with Hypothesis 8, about the number of conversations with faculty (item 41).

Asked the number of faculty (item 42) who knew them quite well and were personally interested in their progress, the question with which the ninth hypothesis dealt, again no significant differences between the 1970 and 1972 samples were found.

Six topics of conversation (items 53, 54, 55, 56, 57, and 58) between students and their faculty advisors were the subject of Hypothesis 10. Respondents were asked to estimate the amount of time during the "present semester" they had talked with their advisors about formal academic arrangements, future educational or vocational plans, problems and issues in their personal lives, general topics in the faculty member's academic field, campus events and issues, or engaged them in other general conversations. Only the first option, formal academic arrangements yielded differences that were statistically significant and those differences were in opposition to those predicted in the alternate hypothesis: students in the 1970 sample reported higher time intervals discussing that subject with their advisors than did students in the 1972 group.

In items 59, 60, 61, 62, 63, and 64, associated with Hypothesis 11, respondents were asked to estimate the amounts of time they had spent talking with faculty members other than their advisors about the same subjects. Tests of the differences failed to reach significance on any item.

Hypotheses 12 through 15 explored the importance of intellectual exchange in the peer environment. Hypothesis 12 posed the possibility of differences in the amounts of time respondents in the two samples

estimated they spent discussing their academic areas of study with friends (item 77). The differences between samples were not significant.

The importance of intellectual exchange and challenge to respondents' relationships with best friends of the same sex (item 82), best friends of the opposite sex (item 93), and the groups of friends with whom they associated most (item 104) were considered in Hypotheses 13, 14, and 15 respectively. The null hypothesis could not be rejected in any of the cases.

The authority for decision making in the educational process was the subject of Hypotheses 16 and 17. Hypothesis 16 was concerned with the degree to which students would choose statements reflecting a classroom environment in which students shared in planning their learning experiences (item 2). As predicted in the alternate hypothesis, respondents in the 1972 sample chose the student-centered options more frequently than those in 1970. However, in item 3 considered under Hypothesis 17, no difference between samples was discovered in the degree to which students perceived they influenced course content and procedures.

The level of students' interest in courses was investigated in Hypotheses 18 and 19. Three items (36, 37, and 38) were related to the former hypothesis. The 1972 respondents reported feeling "bored,

uninterested" in their courses significantly less frequently than those in 1972 (item 36). At the same time, they were more frequently "interested, attracted" (item 37) and "challenged to do your best thinking" (item 38) than those in the 1970 sample.

Hypothesis 19 investigated item 6 in which students were given seven options to describe their principal motivation for study. Four of the options could be described as representing intrinsic reasons and three as extrinsic. No significant differences were found in the frequencies of extrinsic choices. Significant differences were found in the frequencies with which intrinsic reasons were cited. However, only two, "to have a sense of mastering the material" and "to study questions of concern," revealed differences congruent with the alternate hypothesis that students in the 1972 sample would choose intrinsic options more frequently than those in 1970. Students in the earlier sample chose "to broaden my general knowledge" and "because it is enjoyable" more frequently than those in 1972.

In the last hypothesis, number 20, the amount of influence attributed to faculty by respondents over six vectors of change was considered. No significant differences in the frequency of the responses to any of the items (47, 48, 49, 50, 51, or 52) were found.

CHAPTER V

SUMMARY AND CONCLUSIONS

This study was based on a theory about the nature of what Axelrod described as the "degree" system.¹ As discussed above (in Chapter I), Axelrod portrayed the system as having six dimensions. Three were structural: program content, scheduling, and grading and credit. Three were implemental: professor and student roles in the instructional process, students' out-of-class learning experiences, and the power syndrome in the teaching and learning process. Axelrod, Chickering, and others have claimed that a change in one part of the degree system cannot change the fundamental impact of that system on students unless it is accompanied by complementary changes in the rest of the system's dimensions.

The central purpose of this study was to determine if, in fact, a radical change in one dimension of the system--scheduling, to use Axelrod's terminology--could be determined to have enforced changes in other

¹Axelrod, The University Teacher as Artist, pp. 165-69.

elements of the degree system. Specifically, the study investigated whether the change in the scheduling system would result in changes in the roles of faculty and students in the classroom; students' out-of-class learning experiences including study behaviors, interaction with faculty, and the importance of intellectual exchange in the peer environment; and the power syndrome of the teaching-learning process. Also considered were students' level of interest in their courses and their perceptions of the impact of faculty in six change vectors.

Previous to the 1970-71 academic year, The Colorado College had operated on a traditional semester calendar with students and faculty engaged in concurrent courses. Believing this led to undesirable fragmentation, the faculty initiated a search for a new plan of education. A modular course system in which the academic year was broken into nine blocks was adopted and implemented in the Fall of 1970. For the most part, students take only one course at a time and faculty members teach only one course during each block. The blocks, or modules, are approximately a month in duration.

The procedure for examining the impact of this change was to study students' perceptions of the college environment before and after the implementation of the modular calendar. There have been several methods

devised for studying the norms, practices, and characteristics that constitute the climate of colleges and universities.

The Study of College Environments

Pace and Stern developed the Activities Index to measure the psychological needs of students and the corresponding College Characteristics Index to define the institution's "press" or input. The press is important for its capacity to satisfy or frustrate the needs of students. Later, Pace took the most useful of the items from the College Characteristics Index to create the instrument he called College and University Environmental Scales. It used students' perceptions of their environments to measure an institution's press on five scales: practicality, community, awareness, propriety, and scholarship.

The Environmental Assessment Technique was developed by Astin and Holland to measure colleges on demographic dimensions. Based on the premise that a major portion of a campus's environment is transmitted by the people associated with it, the EAT uses eight measures: institutional size, intelligence level of students, and the proportion of students in each of six types of major fields defined as realistic, intellectual, social, conventional, enterprising, and artistic.

Astin based his later methodology for measuring the environment of a college or university on observable environmental stimuli. Defining environmental stimuli as behaviors, events, or other characteristics with the potential of changing students' sensory input, he excluded from his conception the image-oriented, impressionistic approach that contaminated, in his view, the validity of the College and University Environmental Scales instrument designed by Pace.

The instrument used in this study, the Experience of College Questionnaire (ECQ), was developed by Arthur W. Chickering for the Project on Student Development in Small Colleges. It is closer in its rationale to Astin's Inventory of College Activities than to any of its predecessors. It consists of a 159-item instrument that asks for responses reflecting actual activities and experiences. Respondents report those experiences for specific time intervals and situations. There are thirty-nine items having to do with academic experiences, twenty-four that deal with student-faculty relationships, forty-nine with the peer environment, and the balance of the items inquire about extracurricular activities.

Chickering theorizes that the daily routines and exceptional experiences of students result from college policies and practices. The environment

created by these policies and practices either enhances or retards the development of students and their learning.

The ECQ was first used in a study of twenty-one liberal arts colleges of which thirteen were involved in the five-year investigation (referred to above) of student development in small colleges and eight were participants in research conducted by the Center for the Study of Higher Education at the University of Michigan.

In reporting the results of their analysis, Chickering and Blackburn associated differences in reported experiences at colleges involved in the Project on Student Development in Small Colleges with the policies of those institutions. At colleges where the classroom environment was characterized as instructor-centered, study behaviors were content oriented, student interaction with faculty outside the formal course structure was weak, and the level of students' interest in their courses was lower than that reported by students at colleges in which instruction was more influenced by students.

Design of the Study

In April, 1970, while Colorado College still followed a traditional semester calendar with concurrent courses, the ECQ was administered to 222 students

randomly selected from a total student population of approximately 1,750. During May, 1972, at the end of the second year of using a modular calendar and intensive courses, the ECQ was completed by a second sample including 258 Colorado College students.

For this study, twenty hypotheses were constructed about the descriptions by students in the two samples of their classroom roles and that of the faculty; of their study activities, interaction with members of the faculty, and the relationship of the academic program to the peer culture; of the locus of decision making in the educational process; the level of interest in courses; and the influence of faculty in specified areas of change.

The frequency of responses to items of the ECQ was compared between samples to determine if differences existed in the responses made by students in 1970, when concurrent courses were central to teaching and learning at Colorado College, and in 1972, two years after the implementation of the intensive course plan. The chi square test of homogeneity was used to test the significance of differences on all but one item and post-hoc comparisons were made to determine the direction of differences identified by the testing. The t-test was applied to data from one item in which sample means could be determined.

Analysis of the Data

The twenty hypotheses involved the analysis of data from fifty-two Experience of College Questionnaire items. The hypotheses were divided into five groups.

Professor and Student Roles in the Classroom

Studies by Chickering and Blackburn¹ associated the reporting of less class time taken up by listening and taking notes with reports of greater amounts of class time used for more active student classroom roles. No significant difference between samples was found in the percentages of class time reported spent listening and taking notes (item 23), but students in the 1972 sample did estimate greater amounts of time used for "actively working at desk problems or lab tasks" (item 25) and "participating in class discussions or making statements to the class" (item 26).

Correspondingly, students in 1972 answered positively more frequently than those in the earlier sample the statements that "The teacher encourages class discussion," "I sometimes argue openly with the teacher," and "I sometimes argue openly with other students in the class," items 10, 20, and 21 respectively. The difference between samples in the responses

¹Chickering and Blackburn, "The Undergraduate," Ch. 1, pp. 8-10.

to item 19, "I almost never speak unless called on," were significant with students in the 1972 sample giving a negative response more frequently than those in 1970.

Chickering and Blackburn theorized that if the largest amounts of class time were used by students for listening and taking notes, study would be dominated by "memorizing: learning specific things, words, ideas, methods, so that you can remember them pretty much in the same form in which you encountered them" (item 28). Less time, then, would be spent on other mental activities such as interpreting, applying, analyzing, synthesizing, and evaluating.¹ However, in comparing the responses of the 1970 and 1972 samples to the six statements describing mental activities during study (items 28 through 33), no significant differences were discovered in the percentages of time estimated to have been spent memorizing, interpreting, or evaluating. There were differences in the estimates for study time devoted to applying concepts to new problems or situations (item 30), analyzing material into parts and detecting relationships and organization (item 31), and synthesizing ideas into new plans and relationships and organization (item 32). Students in the 1972

¹Ibid., Ch. 2, p. 16.

sample more frequently reported higher expenditures of study time for these activities than did students in 1970.

Students in the sample taken after the implementation of the intensive course plan described their general patterns of study as more rigorous than those in the 1970 sample. However, when asked the number of hours spent in studying during the previous week, no significant differences were found.

It was expected, too, that greater participation by students in the classroom would be followed by more informal interaction with faculty outside the classroom. Comparison of data from the items inquiring about the number of conversations with faculty outside the formal class structure, the number of faculty members with whom such conversations had taken place, and the number of faculty members who knew the respondents "quite well" revealed no statistically significant differences.

Further, given six topics of conversations with advisors and with other faculty, only one resulted in significant differences between samples in the estimate of time during the semester used in discussing the subject. In that case, students in 1970 estimated the amount of time they had discussed formal academic arrangements with their advisors at the larger intervals more frequently than the 1972 sample.

Four items investigated the importance of intellectual exchange in the peer environment. The null hypothesis could not be rejected on any of the four (items 77, 82, 93, and 104).

Power Syndrome in the Teaching and Learning Process

Although students in the 1972 sample chose statements describing a student-centered classroom environment (item 2) more frequently than those in 1970, no differences between samples could be determined in the degree to which students perceived they influenced course content and procedures (item 3).

Level of Students' Interest in Courses

The 1972 respondents reported feeling "bored, uninterested" in their courses less frequently than those in 1970 (item 36). They reported feeling "interested, attracted" and challenged to do their best thinking (items 37 and 38) more often than those in the 1970 sample. The investigation of principal motivations for study (item 6) provided only mixed results even though statistical significance was achieved.

Degree of Faculty Influence

Six items questioned the amount of influence over six vectors of change respondents attributed to faculty. No significant differences in the frequency of responses to any of the items were found.

Conclusions

In Axelrod's description of the degree system, he defined the scheduling subsystem as the dimension encompassing all the arrangements by which learners and teachers gather to take part in the teaching-learning process, including when, where, how often, and for how long. This study has examined whether a change in the scheduling dimension at Colorado College was followed by changes in other dimensions of the degree system. A comparison of students' descriptions of the environment of Colorado College before the implementation of the scheduling change and after that change was chosen as the demonstration of whether the characteristics of other dimensions of the degree system had been altered.

The instrument provided no data relative to changes in program content or the practices of grading and awarding credit which, along with the scheduling pattern, make up the three structural dimensions of Axelrod's degree system. There were changes from 1970 to 1972 in the three implemental dimensions: professor

and student roles in the classroom, students' out-of-class learning experiences, and the power syndrome in the teaching and learning process. They were not, however, as pervasive as surface observation of the ramifications of the scheduling change might have suggested.

The nature of the scheduling dimension change required certain changes in the mechanics of teaching and learning. For example, it was pointed out above (in Chapter I) that exclusive dependence on the lecture as a teaching method no longer was possible. To lecture in one three-and-one-half week module as many hours as was possible in the semester calendar format is not feasible. Discussion, tutorials, and a greater reliance on independent study were mandated. In part as a result of that change, it could be anticipated that the development of concepts and the awareness of how to find information in a field of study would replace, to a large degree, the emphasis on communication of content.

These changes, if relevant theory were to be supported, would carry over into a different pattern of study behaviors, increased faculty-student interaction, and a larger role for intellectual matters in the peer environment.

Some change in the classroom environment is supported by the data emerging from the two administrations of the Experience of College Questionnaire. Students in the 1972 sample did report a larger role in shaping the instructional process. They did become more active participants in their own learning in terms of being involved more in class discussion than the 1970 sample, more prone to question the instructor as well as other students, and more likely to work at desk problems or lab tasks during class periods than those in the previously studied group.

Given these differences reported by the two samples, it is surprising that the 1972 group was not significantly different in the amounts of time during the courses of reference used for listening and taking notes. It is equally surprising that the evidence of change in the classroom environment was not apparent in their descriptions of study behaviors. No differences were found in the percentages of study time devoted to "memorizing" despite the fact that more class time was taken up with discussion and active participation, activities which would appear to prescribe study that involved interpreting, synthesizing, analyzing, and evaluating. The 1972 sample did report significantly larger percentages of study time spent on applying concepts, analyzing material, and synthesizing

ideas. Interpreting and evaluating, in addition to memorizing, were not significantly different in the time respondents reported devoting to them.

Further, the data related to the intensity of study patterns was mixed. While students in the 1972 sample chose options describing their general patterns of study as more intensive than those in the 1970 group, their estimates of the amount of time spent studying during the previous week could not be shown to be greater.

Finally, the openness of the classroom environment did not carry over into increased student interaction with faculty.

Discussion

The nature of this study does not permit identification of the scheduling innovation as the cause of those differences in the learning environment at Colorado College as revealed in the comparison of responses between the 1970 and 1972 samples. Other variables may have intervened to produce the observed differences.

Students in the two samples, for example, may have been different in their motivations, degrees of aggressiveness, and other factors. Faculty may have altered their instructional styles for reasons not associated with the scheduling change. There is no

obvious reason, however, to suspect that either of these factors entered into the changes in the respondents' description of their experiences.

No alterations were made in the college's criteria for selecting students and there was no extraordinary effort made to publicize the new calendar which might have attracted students to the institution in 1972 who were radically different in their backgrounds from those who made up the student population in 1970. No important changes in the characteristics of the faculty occurred nor was there any special effort to encourage different methods of instruction.

Even though the observed changes cannot correctly be attributed to the calendar modification, the absence of differences does cast doubt on the efficacy of change in the scheduling system, a structural dimension, to mandate change in the implemental dimensions. Both Chickering and Axelrod warned that improvements in the degree system must affect all elements of the learning environment if they are to have significant impact. Data on which this study is based bear out their statements.

It was beyond the scope of this study to compare Colorado College students in 1970 with those of students in other colleges in their patterns of study and degree and scope of interaction with faculty.

Shifts between the 1970 and 1972 Colorado College samples may have been obscured by the 1970 position in those characteristics.

An additional factor to be considered in the failure to identify differences between 1970 and 1972 in the scope of student-faculty interaction involves the nature of instruction in the intensive course model. Since students in 1972 were committed to a single course for the entire day, the opportunity for conversations with other faculty was diminished. Further, the mode of instruction having shifted to include tutorials and independent study, it may have become difficult to determine what constituted conversations outside the formal class structure.

Finally, the full impact of the scheduling change on components of the degree system may not have been realized in the first two years of its implementation. Faculty may not have had time to revise totally their approach to teaching in a compressed time span. Course and program content may not have been altered to the extent additional experience would dictate. Students, too, may not have adjusted so soon to a different approach to learning.

Implications for Future Research

In the process of completing this study, the need for additional research in the area of concern has

been obvious. Perhaps the most pertinent question in higher education is that addressed by Feldman and Newcomb: under what conditions have what kinds of students changed in what kinds of ways?

Research methodology for examining the "conditions" deserves further improvement. College and University Environmental Scales may describe certain emphases of a college's environment, but the instrument does not describe the detail of an institution's input for student development. Both Astin's Inventory of College Activities and Chickering's Experience of College Questionnaire give information about stimuli observed by students. To adequately investigate the soundness of much of the theory surrounding student development, however, more independent and professional measurement is called for than the reports of students provided in these instruments.

As an example, use of Chickering's Experience of College Questionnaire might be combined with detailed observations of the classroom activity of students included in the sample. This would provide important data against which to compare student reports of the class environment.

This study indicated that the increase in the 1972 sample of students describing their class meetings in student-centered terms was accompanied by an increase in students' level of expressed interest in their studies.

Even though the two trends arose simultaneously, there is no basis from this study for the view that the two are related. Further research in which the correlation would be measured between the report that the classroom environment encouraged active participation of students and the expression of a higher level of interest is needed.

An extension of research into this area would involve isolating a population of students involved in a student-centered classroom experience and another participating in an instructor-centered environment. A comparison of responses of the two groups to the Experience of College Questionnaire would offer insight into the impact change in the classroom roles of faculty and students and the power syndrome of the teaching and learning process has on the total environment.

Finally, there is reason to believe that increased maturing of students may alter their learning behaviors and aggressiveness in seeking out interaction with faculty. A study comparing ECQ responses of juniors and seniors with those of freshmen and sophomores would give some indication of the degree to which maturation affects this aspect of college experience.

APPENDIX

APPENDIX

The Experience of College Questionnaire

Arthur W. Chickering

Strategies for Change and Knowledge Utilization
Saratoga Springs, New York

Identifying Information

Name _____ College _____

Year (Check one): Freshman _____ Sophomore _____ Junior _____ Senior _____ Sex: M _____ F _____

Indicate Major Field of study. If undecided, indicate major area of Interest:
(Check one): Biological science _____ Physical science _____ Mathematics _____
Social science _____ Humanities _____ Fine arts, performing arts _____ Education _____
Business _____ Engineering _____ Other _____ (specify)

Living Arrangement (Check one):

College housing on campus _____ College housing off campus _____
Own housing arrangements off campus _____ Living at home _____

General Instructions

This questionnaire asks for information about your experiences and activities at the college you attend. In order to gather information which clearly describes actual campus conditions rather than mere generalizations, the questions direct you to specific times and situations in your experiences. Try to report these as accurately as you can. Some of the particular experiences asked for may not be typical ones for you, but a valid description of your total college experience must include both typical and non-typical experiences. Therefore, please respond to each question even if it deviates somewhat from your usual day, week, or month. Most questions may be answered by checking, circling or writing in the appropriate response. Any instructions you may need to answer the questions are contained in the questionnaire.

At what stage in the semester or term are you? (If you are currently in an intercession period or independent study period, answer "near the beginning".)

Near the beginning _____

Near the middle or end _____

If you are "near the beginning" of the semester or term, answer those questions (numbers 1-46, 53-64, 135-158) which refer to the "present semester" in terms of the PREVIOUS semester or term.

If you are "near the middle or end", respond in terms of the CURRENT semester or term.

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Arthur W. Chickering

ECQ-1

ACADEMIC EXPERIENCES AND ACTIVITIES

In the current semester or previous term, indicate the "course" (class, independent study, tutorial, or other full-credit academic activity) that occurs next after the time checked:

7:50 A.M. Monday____ 9:50 A.M. Tuesday____ 11:50 A.M. Wednesday____
1:50 P.M. Thursday____ 10:50 A.M. Friday____

Name of Course _____

Type of Course: (Check one)

Class____ Independent study____ Tutorial____ Other full-credit academic activity____

Please answer the questions concerning academic experiences and activities in terms of this "course".

For the following items please write the number of the most suitable option in the space beside the number of the question.

- ___1. Approximately how many students are enrolled in this "course"?
(1) 1 (2) 2-5 (3) 6-12 (4) 13-29 (5) 30-59 (6) 60-100 (7) 101 plus
- ___2. Which statement below most nearly describes the role of the teacher?
(1) Teacher dispenses knowledge, or assigns sources, which it is the student's job to master.
(2) Teacher directs his effort flexibly in order to help students learn.
(3) Teacher and students work together as both he and they increase their understanding of the subject.
(4) Teacher serves mainly as a resource for students, while students have principal responsibility for making and carrying out their own plans.
- ___3. In some courses content and procedures are clearly specified by the instructor, and students have little or no influence on those decisions; in other courses, students influence in varying degrees the content of study and the class procedures. How much do students in this course influence content or procedures?
(1) Not at all.
(2) In minor respects within a clear structure set by the teacher.
(3) In some fairly important respects within a general structure set by the teacher.
(4) In major aspects of content and/or procedure.
- ___4. What has been your general pattern of study?
(1) I usually coast, but work fairly hard at times.
(2) I work at a moderate level fairly steadily.
(3) I work at a moderate level and sometimes quite hard and long.
(4) I work fairly intensively most of the time, and hard and long at times.
- ___5. Have you kept up to date on your assignments?
(1) I have almost always been behind on my assignments.
(2) More often than not I have been behind.
(3) More often than not I have kept my assignments up to date.
(4) I have almost always kept up to date.

- ___6. People invest time and energy studying for different reasons. Class in and class out, day in and day out, what is the PRINCIPAL reason you study for this course?
- (1) To have a sense of mastering the material, of doing a job well.
 - (2) To complete a requirement for graduation and to obtain academic credit.
 - (3) To broaden my general knowledge, understanding, or background.
 - (4) To study questions I am concerned about and want to understand better.
 - (5) To get a good grade.
 - (6) To learn something that will be useful vocationally or in other future activities.
 - (7) Because it is enjoyable and interesting.

In this section, please write "1" beside each of the statements which apply to this course. Write "2" beside statements which do not apply.

- ___7. Students have assigned seats.
- ___8. Attendance usually is taken.
- ___9. Lectures follow the textbook.
- ___10. The teacher encourages class discussion.
- ___11. I have been in the teacher's office.
- ___12. If he wanted to, a student probably could pass this course mainly on "bluff"
- ___13. The teacher knows my name.
- ___14. The teacher is engaged in some kind of research.
- ___15. We sometimes have unannounced quizzes.
- ___16. Examinations are usually of the "objective" type (multiple choice, matching, etc.)
- ___17. Examinations are usually of the "essay" type.
- ___18. Examinations are not given.
- ___19. I almost never speak unless called on.
- ___20. I sometimes argue openly with the teacher.
- ___21. I sometimes argue openly with other students in the class.
- ___22. I have been a guest in the teacher's home.

Different "courses" and "classes" call forth different activities during class meetings and different mental activities in study. For the two clusters which follow indicate the percent of time spent by writing the number of the most suitable option in the space opposite EACH activity. Because activities can overlap in time, percents need not add to one hundred.

- (1) 5% or less
- (2) 6%-20%
- (3) 21%-50%
- (4) 51%-80%
- (5) 81% or more

What percent of your time is spent on the following activities during class meetings?

- ___ 23. Listening to what is being said, primarily in order to remember (include taking notes if you do this).
- ___ 24. Doing your own thinking about the ideas presented: analyzing, thinking of implications, checking for soundness, mentally criticizing, etc.
- ___ 25. Actively working at desk problems or lab tasks relevant to the class.
- ___ 26. Participating in discussion, making statements to the class, speeches, formal presentations.
- ___ 27. Doing things unrelated to class: daydreaming, dozing, writing letters, reading, thinking about ideas for other classes, bull sessions, etc.

What percent of your time is spent on the following mental activities as you study for this course?

- ___ 28. Memorizing: learning specific things, words, ideas, methods, so that you can remember them pretty much in the same form in which you encountered them.
- ___ 29. Interpreting: mentally putting things in different terms, translating, reorganizing, making inferences or extensions of thinking based on principles given.
- ___ 30. Applying: drawing upon a variety of concepts and applying them to new problems or situations.
- ___ 31. Analyzing: analyzing material (data, literary works, argumentative or discursive material, etc.) into parts and detecting relationships among parts and ways they are organized.
- ___ 32. Synthesizing: organizing ideas, information, or parts into new plans, relationships, or structures, as in developing plans for an experiment, writing a poem or essay, deriving principles from data, integrating information from diverse sources.
- ___ 33. Evaluating: making judgements about the value of materials (concepts, evidence, theories, arguments, communications) and methods.

How often have you experienced the feelings below in relation to this course?

- (1) Rarely or occasionally
(2) Frequently or most of the time

- ___34. Worried, tense
___35. Confident, competent
___36. Bored, uninterested
___37. Interested, attracted
___38. Challenged to do your best thinking

- ___39. Among the courses you are taking during the "present semester", how valuable is this one?

- (1) The most valuable
(2) Average
(3) The least valuable

If this course has major strengths and/or major weaknesses which we should know about please describe them here.

STUDENT-FACULTY RELATIONSHIPS

During the PRESENT SEMESTER:

- ___ 40. How many different INDIVIDUAL MEMBERS of the faculty and/or administration have you talked with for more than five minutes, outside of a class meeting or scheduled independent study or tutorial conference?
(1) None (2) 1 or 2 (3) 3-5 (4) 6-10 (5) 11-15 (6) 16 or more
- ___ 41. How many CONVERSATIONS OR CONFERENCES with faculty and/or administration have you had lasting more than five minutes, outside of a class meeting or scheduled independent study or tutorial conference?
(1) None (2) 1 or 2 (3) 3-5 (4) 6-10 (5) 11-15 (6) 16 or more
- ___ 42. How many members of the faculty and/or administration know you quite well and are personally interested in how you are getting along?
(1) None (2) 1 or 2 (3) 3-5 (4) 6-10 (5) 11-15 (6) 16 or more
- ___ 43. How many times have you participated with members of the faculty or administration in out-of-class activity groups, meals, or social occasions?
(1) None (2) 1 or 2 (3) 3-5 (4) 6-10 (5) 11-15 (6) 16 or more
- ___ 44. How many times have you been in the home(s) of faculty members and/or administrators?
(1) None (2) 1 or 2 (3) 3-5 (4) 6-10 (5) 11-15 (6) 16 or more
- ___ 45. How many times have members of the faculty and/or administration come to your residence hall and talked with you alone, or with you and other students in a formal or informal gathering?
(1) None (2) 1 or 2 (3) 3-5 (4) 6-10 (5) 11-15 (6) 16 or more
- ___ 46. What proportion of your teachers really welcome a visit from you to their offices to discuss interesting ideas, or difficulties encountered in a course you are taking with them?
(1) 0% (2) 1-20% (3) 21-40% (4) 41-60% (5) 61-80% (6) 81-100%

Below are listed several ways in which you may or may not have been influenced by your relationships with faculty members. Indicate how much you were influenced by writing the most appropriate option opposite EACH alternative.

- (1) To a minor extent
(2) To a moderate extent
(3) To a major extent
- ___ 47. Becoming more open to people and more understanding of them.
- ___ 48. Seeing myself more clearly.
- ___ 49. Increasing my range of feelings, sensitivities and awareness (aesthetic, social, spiritual).
- ___ 50. Increasing my sense of purpose and direction.
- ___ 51. Clarifying my values and beliefs.
- ___ 52. Increasing my intellectual competence and/or curiosity.

The substance of student-faculty conversations and exchange varies from student to student and faculty member to faculty member. For the duplicate clusters of items below indicate the amount of conversational time spent during the "present semester" by writing the number of the most suitable option opposite EACH TOPIC of conversation.

- (1) None
- (2) A few minutes
- (3) About half an hour
- (4) About an hour
- (5) Two or three hours
- (6) Four hours or more

How much time has been spent talking with that member of the faculty or administration with whom you work out your academic program, about:

- ☐ 53. Formal academic arrangements (scheduling, requirements, credits, etc.)
- ☐ 54. Questions, ideas, problems concerning your future educational or vocational plans.
- ☐ 55. Problems and issues of immediate concern in your personal life (adjustment to academic program, social relations, worries, etc.).
- ☐ 56. General topics in the academic field of the faculty member.
- ☐ 57. Campus events, activities, issues.
- ☐ 58. Other general conversations, either light or serious.

How much time has been spent talking with other members of the faculty and/or administration, about:

- ☐ 59. Formal academic arrangements (scheduling, requirements, credits, etc.)
- ☐ 60. Questions, ideas, problems concerning your future educational or vocational plans.
- ☐ 61. Problems and issues of immediate concern in your personal life (adjustment to academic program, social relations, worries, etc.).
- ☐ 62. General topics in the academic field of the faculty member.
- ☐ 63. Campus events, activities, issues.
- ☐ 64. Other general conversations, either light or serious.

If there is additional information about your relationships with members of the faculty and administration which you think we should know about and which you are willing to share please do so here.

ECQ-7

FRIENDS AND ACQUAINTANCES

- ___65. How many students at the college do you consider to be close friends?
(1) None (2) 1-3 (3) 4-9 (4) 10-19 (5) 20-29 (6) 30 or more
- ___66. How many students at the college are you acquainted with by first name, nickname or last name?
(1) 24 or less (2) 25-50 (3) 51-100 (4) 101-200 (5) 201 or more
- ___67. How many roommates do you have?
(1) None (2) 1 (3) 2 (4) 3 (5) 4 (6) 5 or more
- ___68. How many other students live on your floor?
(1) None (2) 1-6 (3) 7-16 (4) 17-32 (5) 33-48 (6) 49 or more
- ___69. How many other students live in your residence?
(1) None (2) 1-6 (3) 7-16 (4) 17-32 (5) 33-48 (6) 49-100 (7) 101 or more
- ___70. How many regularly scheduled "courses" or other academic activities do you attend in your residence EACH WEEK?
(1) None (2) 1-3 (3) 4-6 (4) 7-9 (5) 10 or more
- ___71. How many casual coke, coffee, or study dates have you had with a person of the opposite sex during the past MONTH?
(1) None (2) 1-3 (3) 4-9 (4) 10-19 (5) 20-39 (6) 40 or more
- ___72. How many informal dates for movies, student gatherings, and other occasions have you had with a person of the opposite sex during the past MONTH?
(1) None (2) 1-3 (3) 4-9 (4) 10-19 (5) 20 or more
- ___73. How many formal dates to dances and big parties have you had during the past MONTH?
(1) None (2) 1 (3) 2 (4) 3 (5) 4 or more

Topics of conversation with friends and acquaintances vary. Indicate how much time has been spent in the PAST WEEK - during meals, in the dorm, walking to and from class - talking with friends and acquaintances about EACH TOPIC.

- (1) None
(2) A few minutes
(3) About half an hour
(4) About an hour
(5) Two or three hours
(6) Four hours or more

- ___74. Formal academic arrangements (scheduling, requirements, etc.).
- ___75. Questions, ideas, problems concerning your future educational or vocational plans.
- ___76. Problems and issues of immediate concern in your personal life (adjustment to academic program, social relations, worries, etc.).
- ___77. General topics in academic areas of study.
- ___78. Movies, plays, concerts, art shows, visiting speakers, etc.
- ___79. Campus events, activities, issues.
- ___80. International affairs (U.S. Foreign policy and military activities, conflicts among other nations, population problems, etc.).
- ___81. Domestic affairs (civil rights, poverty, inflation, environmental problems, welfare programs, etc.).

Below are listed several characteristics and influences which may be more or less important in relationships with your best friend of the same sex, of the opposite sex, and with the group of students with whom you most closely associate. Indicate the importance of these characteristics and influences by writing the number of the most suitable option opposite EACH alternative.

- (1) To a minor extent
- (2) To a moderate extent
- (3) To a major extent

Think of your best friend of the same sex. How much a part of the relationship is each of the following?

- ___ 82. Intellectual exchange and challenge
- ___ 83. Exploring moral or religious issues
- ___ 84. Working out aspects of our mutual relationship
- ___ 85. Venturing together in new ways of behaving
- ___ 86. Enjoying spontaneous friendly relationships as such

How much has this relationship influenced each of the following?

- ___ 87. Becoming more open to people and more understanding of them
- ___ 88. Seeing myself more clearly
- ___ 89. Increasing my range of feelings, sensitivities, and awareness (aesthetic, social, spiritual)
- ___ 90. Increasing my sense of purpose and direction
- ___ 91. Clarifying my values and beliefs
- ___ 92. Increasing my intellectual competence and/or curiosity

Now think of your best friend of the opposite sex. How much a part of the relationship is each alternative?

- ___ 93. Intellectual exchange and challenge
- ___ 94. Exploring moral or religious issues
- ___ 95. Working out aspects of our mutual relationship
- ___ 96. Venturing together in new ways of behaving
- ___ 97. Enjoying spontaneous friendly relationships as such

How much has this relationship influenced each of the following?

- ___ 98. Becoming more open to people and more understanding of them
- ___ 99. Seeing myself more clearly
- ___ 100. Increasing my range of feelings, sensitivities, and awareness (aesthetic, social spiritual)
- ___ 101. Increasing my sense of purpose and direction
- ___ 102. Clarifying my values and beliefs
- ___ 103. Increasing my intellectual competence and/or curiosity

Now think of the group of students with whom you most closely associate. How much a part of these relationships is each alternative?

- ___ 104. Intellectual exchange and challenge
- ___ 105. Exploring moral or religious issues
- ___ 106. Working out aspects of our mutual relationship
- ___ 107. Venturing together in new ways of behaving
- ___ 108. Enjoying spontaneous friendly relationships as such

How much have these relationships influenced each alternative?

- ___ 109. Becoming more open to people and more understanding of them
- ___ 110. Seeing myself more clearly
- ___ 111. Increasing my range of feelings, sensitivities, and awareness (aesthetic, social, spiritual)
- ___ 112. Increasing my sense of purpose and direction
- ___ 113. Clarifying my values and beliefs
- ___ 114. Increasing my intellectual competence and/or curiosity

EXTRA-CURRICULAR ACTIVITIES

Please indicate your participation in the extra-curricular activities listed below by writing the number of the most suitable option opposite EACH alternative.

- (1) No participation
- (2) I participated to a limited degree
- (3) I was a full-fledged participant, but had no leadership responsibilities
- (4) I served in an active role as officer, chairman, committee head, captain, etc.

- ___ 115. Planning and regulatory activities of living group
- ___ 116. Student or community government
- ___ 117. Varsity or intramural sports (Include practicing with team if not in game)
- ___ 118. Activities sponsored by religious groups (Excluding attendance at services as a participant with no special assigned role.)
- ___ 119. On-campus organizations for students interested in a special vocational or academic field
- ___ 120. School spirit and hospitality organizations or activities (Including freshman orientation committees, guides, rally and pep groups.)
- ___ 121. Drama, music, and art activities (In non-audience capacity.)
- ___ 122. Social service or special educational work (Tutoring, leading youth groups, leading recreation, etc.)
- ___ 123. Groups for student recreation (Folk dancing, outing group, hobby group.)
- ___ 124. Journalism, broadcasting, literary activities
- ___ 125. Other

- ___ 126. How many extracurricular activities did you participate in, at least "to a limited degree"?

(1) None (2) 1 (3) 2 (4) 3 (5) 4 (6) 5 or more

- ___ 127. In how many different activities are you an officer, chairman, committee head, captain, etc.?

(1) None (2) 1 (3) 2 (4) 3 (5) 4 (6) 5 or more

How many hours during the past WEEK have you spent in the following activities?

- ___ 128. Studying in relation to "courses" taken for academic credit?

(1) 9 or less (2) 10-19 (3) 20-29 (4) 30-39 (5) 40 or more

- ___ 129. Reading for pleasure

(1) None (2) 1-3 (3) 4-7 (4) 8-12 (5) 13 or more

- ___ 130. Playing chess, cards, checkers, etc.

(1) None (2) 1-3 (3) 4-7 (4) 8-12 (5) 13 or more

- ___ 131. Participating in sports and practice sessions

(1) None (2) 1-3 (3) 4-7 (4) 8-12 (5) 13 or more

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- ___132. Watching television
(1) None (2) 1-3 (3) 4-7 (4) 8-12 (5) 13 or more
- ___133. Attending movies, plays, concerts, visiting speakers, etc.
(1) None (2) 1-3 (3) 4-7 (4) 8-12 (5) 13 or more
- ___134. In informal discussions about serious topics
(1) None (2) 1-3 (3) 4-7 (4) 8-12 (5) 13 or more

How often has EACH of the following activities or experiences occurred for you during the "present semester"?

- (1) Not at all
(2) Occasionally
(3) Frequently

- | | |
|---|---|
| ___135. Lost privileges for infraction of college rules | ___148. Became intoxicated |
| ___136. Played a musical instrument | ___149. Drank wine |
| ___137. Drank beer | ___150. Went to the movies |
| ___138. Voted in a student election | ___151. Attended a public recital or concert |
| ___139. Studied in the library | ___152. Went to an overnight or weekend party |
| ___140. Overslept or missed a class or appointment | ___153. Argued with other students |
| ___141. Had a blind date | ___154. Was interviewed as a client in the college counselling center |
| ___142. Drank in a bar or club | ___155. Called a teacher by his or her first name |
| ___143. Participated in informal group singing | ___156. Checked out a book or journal from the college library |
| ___144. Cribbed on examinations | ___157. Asked questions in class |
| ___145. Asked a faculty member for advice | ___158. Demonstrated for some issue not directly related to the college |
| ___146. Demonstrated against some administrative policy | |
| ___147. Tried to get an instructor to change a test or course grade | |

If there are other things you think we should know about your extra-curricular activities during the "present semester" please tell us about them here.

- ___159. How well satisfied are you with your educational experience at your college?
(1) Very well (2) Fairly well (3) Not very well (4) Not at all
- ___160. Have you ever thought your college was not the right college for you?
(1) Frequently (2) Occasionally (3) Only once or twice (4) Never
- ___161. If you could choose a college all over again, knowing what you know now about your college, would you choose to come here again?
(1) Definitely yes (2) Probably yes (3) Undecided (4) Probably not (5) Definitely not

Below you will find a list of statements about how you study at your college. Please work through it rapidly, circling "T" if the statement is TRUE or MOSTLY TRUE for you, and "F" if the statement is FALSE or NOT USUALLY TRUE for you.

- | | | |
|---|---|---|
| 162. Without grades I cannot evaluate my intellectual ability. | T | F |
| 163. I am often involved in following up my own ideas when I am supposed to be doing homework. | T | F |
| 164. I find I cover the set material equally proficiently whether I find it interesting or not. | T | F |
| 165. Often I learn more from studying along my own lines than through completing set assignments. | T | F |
| 166. I am particularly interested in several topics that are outside my course work. | T | F |
| 167. I sometimes experience great relief when I can find someone who will give me advice and encouragement about my academic work. | T | F |
| 168. I generally prefer not to be told exactly how to do things, even if it saves me a lot of time. | T | F |
| 169. I like to know, with homework assignments, exactly what I am supposed to be doing, how important it is, and preferably how long it should take me. | T | F |
| 170. I usually study only what I am required to study. | T | F |
| 171. I like to be left to work things out entirely on my own. | T | F |
| 172. In labs I like to be given clear instructions about what to do; otherwise it turns out to have been a waste of time. | T | F |
| 173. I consider the best possible method of learning is by completing the homework assignments and by doing the required reading. | T | F |
| 174. I feel that I have certain special abilities and specific interests that will not be rewarded at my school. | T | F |
| 175. The topics I get specially interested in are ones that I come across in the required reading. | T | F |
| 176. In general, I feel the assignments do not give me enough freedom and I would like to see them less structured. | T | F |
| 177. When studying the subjects I like most I find I work very much harder. | T | F |

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