STUDENT CHOICES AND CREDIT DISTRIBUTION IN GENERAL EDUCATION: AN EVALUATION MODEL

By

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ABSTRACT

STUDENT CHOICES AND CREDIT DISTRIBUTION IN GENERAL EDUCATION: AN EVALUATION MODEL

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The purpose in this study was to develop a model to evaluate student choices to meet general education distributional requirements. Reform efforts focusing on program contents and philosophy will have little effect if students fail to understand the value of general education or relate its contents to their major fields of study. This researcher examined the selections students made to meet distributional requirements, factors that influenced those choices, credits earned in distributional areas, and students' perceptions of the benefit of general education to their general development and in understanding of their majors.

Data were collected through interviews and transcript audits of baccalaureate students from Lake Superior State University. Using analysis of variance, differences were analyzed based on disciplinary major, gender, transfer status, age, and nationality of students. The findings were as follows:

1. Departments, through degree requirements, determined, to a great extent, the general education experience of students by constraining their choices.

2. Students earned few credits in the distributional areas of general education. Mean total credits earned in the humanities were near the minimum requirements. Total credits earned in the social and natural sciences were greater for some disciplinary majors. Business and engineering technology students earned the least credit in the three distributional areas.

3. Students attached the least importance to faculty advice in making their course selections. Reputation of the instructor, followed by personal preferences of students with respect to scheduled times or days, were most important. Differences among students based on disciplinary major were found.

4. Students attached low value to general education courses outside the distributional area of their majors. Students in business and engineering technology programs perceived the least benefit from general education. Students rated humanities courses as least beneficial. Older students and students who completed requirements as juniors or seniors rated humanities courses as more beneficial to their general development than did younger students or those who completed requirements as freshmen or sophomores.

This dissertation is dedicated to my wife, Linda, for her unwavering support and the sacrifices she made to allow me this opportunity for growth. Her continuous belief in me and the motivation she provided helped me to bring this study to closure.

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CHAPTER I

THE PROBLEM

The general education component of undergraduate education in the United States is under scrutiny. Interest in reforming general education did not dissipate after the reform efforts of the early 1980s. Gaff (cited in Reardon, 1990) reported that more than 90% of American colleges have undertaken reviews of their general education offerings.

Changes in General Education

One movement has been toward more prescription of requirements. Bok (1986) described this question as one of the three perennial issues in the discussion of the liberal arts curriculum:

> The first of these is how much to prescribe and how much to leave to the free choice of students. Those who argue for detailed requirements claim that college students are too young to know what subjects are truly important and too disposed toward courses of immediate or practical relevance. Those who favor more electives believe that students are much too varied in their interests to be forced into a single curricular mold. (p. 40)

A Carnegie Foundation (1985) survey regarding general education revealed that 60% of the four-year institutions surveyed were reviewing or revising general education requirements. The Carnegie Foundation reported that an all-campus review committee was the format used by about 60% of the institutions, whereas leadership by chief academic or administrative officers ran a distant second. Reviews and revisions were most common at research and doctorate-granting universities. Increases in credit-hour requirements in the social sciences, natural sciences, and humanities have been experienced at about 30% of the institutions since 1970, and decreases in requirements occurred at about 15% of the schools.

The academic officers were in agreement, in the Carnegie Foundation (1985) survey, about the mission of general education. The goal ranked number one by more than two-thirds of the administrators was "to discover the broad range of human knowledge through an introduction to the academic disciplines" (p. 28). The respondents indicated that this goal was, in fact, being realized by students. Some disparity between other goals and the extent of their realization was noted in the survey. The second most important goal was "to guide students toward an ethical and socially responsible philosophy of life." Academic officers ranked this goal fifth in the extent to which it was being achieved by students.

Academic administrators ranked highly the effectiveness of their institutions' general education programs. The Carnegie Foundation (1985) survey revealed that almost 80% of the leaders believed their programs were more effective in 1985 than they were in 1970. More than 75% believed their programs were more effective than those at other institutions, and almost that number stated their belief that programs were meeting the needs of students (p. 29). Administrator and faculty commitment to general education had increased since 1970, according to administrators; however, the strength of student commitment was less dramatic (p. 30). Students' perceptions of their general education experiences have received less attention in the literature than the competing perspectives of faculty members and administrators.

A 1989-90 survey of faculty members by the Higher Education Research Institute at the University of California at Los Angeles (UCLA study) found continued strong support of general education (Mooney, 1991). More than 70% of the faculty respondents agreed that faculty members at their institutions were positive about their general education programs. More than 28% of the faculty agreed that the curriculum had suffered from faculty overspecialization, yet 76% of the faculty believed that faculty members were strongly interested in the academic problems of undergraduates.

In a recent survey of Michigan faculty, Sederburg (1989) reported that 64% of Michigan faculty members rated general education as excellent or better than adequate.

The goals and means of general education, as typically represented in the literature, are illustrated by the issues faculty include as high-priority issues at their institutions (Mooney, 1991, p. 16). The percentage of respondents listing the issue in the UCLA study is stated in parentheses.

Promoting the intellectual development of students (76.1%)

Helping students examine and understand their personal values (47.4%)

Developing a sense of community among students and faculty (41.0%)

Facilitating student involvement in community-service projects (23.3%)

Helping students learn how to bring about change in American society (21.1%)

Helping solve major social and environmental problems (26.3%)

Maintaining a campus climate where differences of opinion can be aired openly (52.0%)

Developing among students and faculty an appreciation for a multicultural society (46.5%)

Creating a more positive undergraduate experience (69.2%)

Creating a more diverse multicultural environment on campus (40.0%)

Enhancing the out-of-class experiences of students (28.8%)

The support for general education and its improvement remains strong. Obstacles to improvement remain. The Carnegie Foundation (1985) survey ranked obstacles to reform as academic leaders viewed them: First was department turfism; second and third, respectively, were competition from department majors and specialization, and competition from the career orientation of students (p. 29).

Demand for General Education

Little research has been done regarding what Reardon (1990) referred to as the "demand side" of general education. Reports on general education have focused on the "supply side" of general education: program contents and philosophy. The best efforts at curriculum design and instructional reform have little effect when students fail to understand the meaning and value of general education or relate its contributions to their major fields of study. Needed demand-side research includes the study of the student choice process. The validity of criticism of general education programs can better be evaluated if this criticism is informed by data describing factors associated with students' selection of courses to meet general education requirements.

> The university now offers no distinctive visage to the young person. He finds a democracy of the disciplines. . . . This democracy is really an anarchy. . . . In short, there is no vision, nor is there a set of competing visions, of what an educated human being is. . . . Out of chaos emerges dispiritedness because it is impossible to make a reasonable choice. Better to give up on a liberal education and get on with a specialty in which there is at least a prescribed curriculum and a prospective career. (Bloom, 1987, p. 337)

Bloom (1987) framed the issue not only as a question of choice but as a question of how one course of study relates to another. He argued that they do not: "They are competing and contradictory, without being aware of it. The problem of the whole . . . is never systematically posed" (p. 339).

Boyer (1987) made the argument for the integrated core curriculum--a program that makes connections across disciplines:

> Undergraduates pick and choose their way to graduation using what food service people call the "scramble system." This cafeteria-like arrangement offers a smattering of courses. Students move from one narrow department requirement to another, rarely discovering connections, rarely seeing the whole. . . . More coherence is required to relate the core program to the lives of students and to the world they are inheriting. There is a need for students to go beyond their separate interests and gain a more integrated view of knowledge and a more authentic view of life. (pp. 90-91)

This criticism of the elective system leaves unanswered the question of the bases for student choices.

Purpose

The researcher's purpose in this study was to develop a model to evaluate students' responses to distributional requirements in general education. Under some constraints with regard to course selection for general education, what do students choose? How might an examination of these choices help educators assess the factors that influence course selection? What benefit do students report from the courses they do select?

The model was applied, by way of illustration, to describe the general education experience of baccalaureate students at Lake Superior State University. The model will prove useful to persons at other educational institutions in assessing the responses of their students to distributional requirements. The findings may have implications for transfer credit articulation with other institutions, program evaluation, advising for general education courses, marketing of the general education program, and dissemination of information to prospective students and other members of the higher education community.

Issues

Data were collected to provide information regarding the following six issues:

1. What courses were selected by students to meet distribution requirements in the humanities, social sciences, and natural sciences?

2. How many credit hours were earned in each of the three distributional areas required, i.e., the humanities, social sciences, and natural sciences?

3. How many credit hours were accumulated when distribution requirements in general education were met?

4. What factors or individuals were important in assisting students to make their selection of courses to meet distribution requirements?

5. What were the students' perceptions of the benefit of courses in the three distributional areas to their personal development and in understanding their majors?

6. Did students indicate that credit hour requirements in each of the three distributional areas should be increased, decreased, or remain unchanged?

Rationale

Reardon (1990) argued that part of the demand-side view of general education deals with communicating with students about the nature and benefits of general education. Student goals must be linked with institutional goals. Reardon cited studies indicating student endorsement of both breadth in general education and narrower vocational goals. Whereas students appear to have an understanding of the mission of general education, they appear to lack a strategy of how to integrate the goals of general education with those of more specialized education leading to employment. The current research, in that it identifies the degree of student reliance on different sources of information when selecting general education courses, will be useful to administrators and faculty members in developing, scheduling, and promoting general education. Institutional goals, the supply side of general education, will be more achievable when attention is given to the demand side.

The scheduling of general education courses may have an effect on course selection by students, either because of other commitments or preferences of students, or because of lack of coordination by departments and scheduling of courses in conflict with each other. Sworder (1986) found a willingness on the part of students to take afternoon classes in general education. The willingness varied by age, gender, and the intentions of the student with respect to transferring to another institution. This willingness would appear to vary from institution to institution, depending on the demographic characteristics of the student body. Such information will be important to consider if student behavior in course selection is expected to conform to intentions of curriculum designers.

Kramer (cited in Suskie, 1983) stated that 95% of the nation's colleges have general education distribution requirements. Suskie conducted a transcript study and found deviations from expected results in terms of courses selected to meet distribution requirements and in terms of failure of students to complete requirements in the humanities. Suskie called attention to the paucity of references in the literature regarding the need for curriculum developers to consider student choice in evaluating distribution requirements.

More research is needed to determine how students actually satisfy the distributional requirements that are commonly imposed. Identification of the factors that influence students' selection of courses to meet distributional requirements is a key component of the larger issue of assessment of the outcomes of general education.

An Evaluation Model

Stake developed a matrix containing 13 information cells representing the kinds of data needed in various kinds of evaluation studies (Kemmis & Stake, 1988, pp. 144-162). For different kinds of evaluations, differential emphasis should be placed on the descriptive and judgmental sides of the matrix (see Figure 1). Information about antecedents, transactions, and outcomes will be given different emphasis, depending on the nature of the evaluation. Antecedents are conditions existing before instruction that may affect outcomes. Transactions are the process component of instruction. Outcomes are the effects of the program.

The model developed for the present study focuses on descriptive information about transactions. Are intended student behaviors (choices) consistent with reality? Are faculty conceptions of the context in which general education is experienced realistic? In this descriptive study, information is provided to check these congruences for students at Lake Superior State University. Findings may have implications for articulation

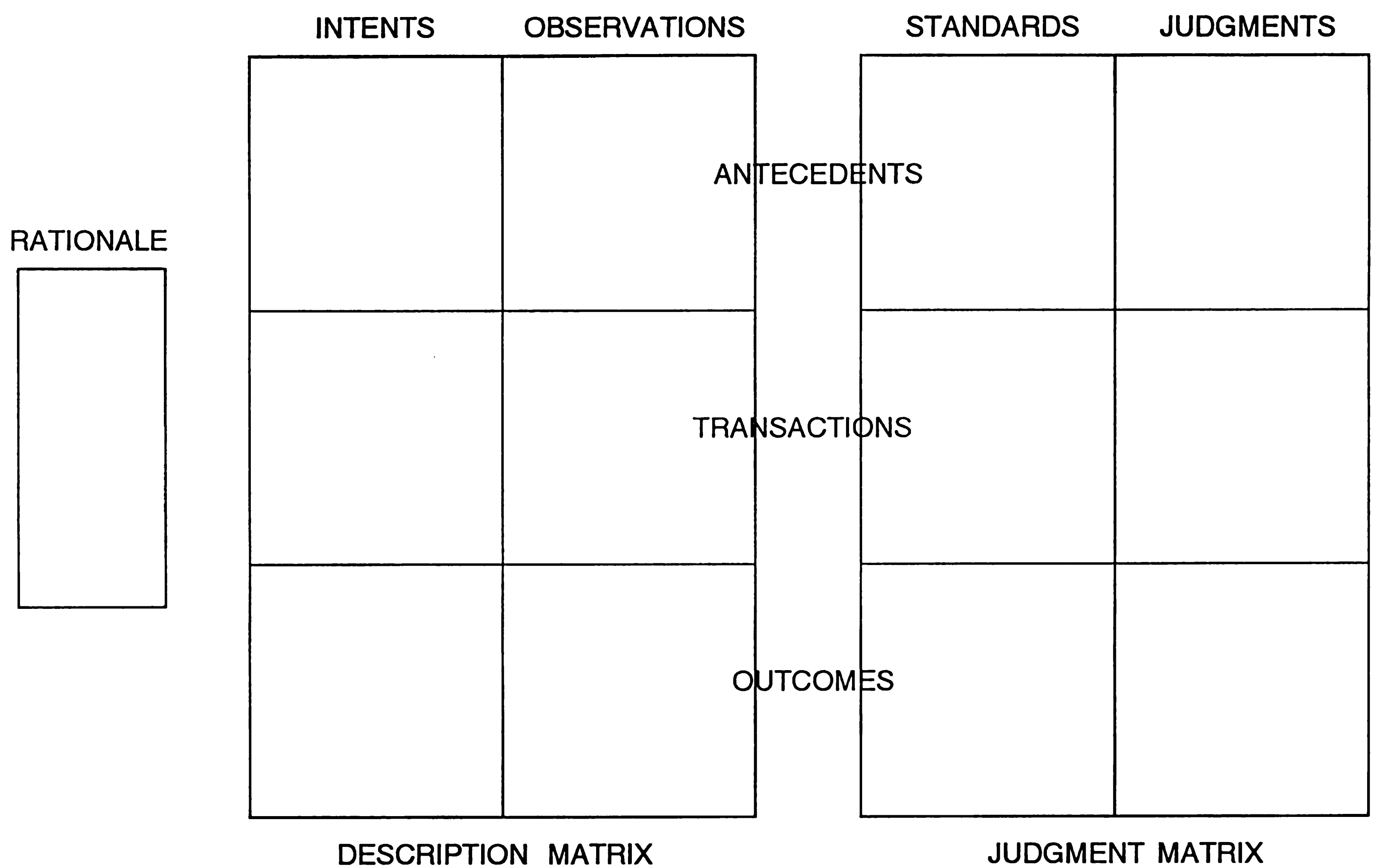


Figure 1: Stake's Countenance Model. (From Kemmis & Stake, 1988.)

agreements with community colleges and for assessment of student outcomes mandated by the North Central Association.

The data provided in this study will be useful to Lake Superior State University (LSSU) in reforming its general education requirements during the 1991 through 1993 academic years as part of the university's assessment program. The model developed here may prove useful to other institutions wishing to examine and evaluate their general education programs. The results may have implications, if replicated elsewhere, for acceptance of transfer credit through articulation agreements with community colleges, such as the agreement through the Michigan Association of College Registrars and Admissions Officers (MACRAO). Replication elsewhere may provide information leading to changes in scheduling, advising, and marketing of general education if the goals of general education, including knowledge, coherence, and integration, are to be realized.

General Education at Lake Superior State University

LSSU has a distribution model in general education. Its requirements, in quarter credits, include 6 credits of English composition, 3 credits of speech, 12 credits of humanities, 12 credits of social science, 12 credits of natural science, and 3 credits of physical education. In addition, another 12 credits are required: a modern foreign language for B.A. degrees and additional mathematics or science (natural or social) for B.S. degrees. Departments may impose more stringent requirements, but they may also designate specific courses to meet these requirements; i.e., departments may allow double-counting. The requirements as reported in the LSSU catalog are included in Appendix A.

Students are allowed virtually no choice for the English composition requirement and none for speech. The factors that determine selection of physical education courses are diverse and were beyond the scope of this study.

For the natural science requirement, students must elect one physical science course and one life science course. All credits must be in courses with laboratory experiences. Students may take courses designed specifically for general education, or they may take introductory courses for majors. Curricula requiring natural science may designate courses to meet all or a portion of the general education requirement in natural science.

The social science requirement allows students the greatest freedom in course selection from a wide array of choices. Credits in sociology, psychology, political science, history, geography, economics, or anthropology may count toward the general education requirement (and the B.S. degree requirement).

Students are more limited in the choices available in humanities. A sequence of survey courses can comprise the full 12 credits. Students may take courses in philosophy, music appreciation, art appreciation, film, mythology, or second-year foreign language; however, no more than six credits in one discipline may count toward the 12-hour requirement.

Transfer Students

Students transferring from a Michigan community college who have already earned an Associate in Arts or Associate in Science, and who come to the university with MACRAO certification, are considered to have met LSSU's general education requirements. MACRAO certification requires six semester credits in composition, eight credits in social science, eight credits in natural science, and eight credits in humanities. Speech and physical education are not required. For such students, LSSU's B.S./B.A. degree requirement of 12 quarter credits is still imposed.

The major difference between satisfying general education requirements at LSSU and through transfer of credit under the MACRAO Agreement is in the area of course selection. Courses can be transferred as humanities (e.g., literature and western civilization) that would not be considered as humanities if taken at LSSU. Furthermore, MACRAO certification requires only one laboratory natural science course; mathematics can be included as part of the requirement.

Another set of general education requirements applies for students transferring from a Michigan community college with an associate degree, but without MACRAO certification. Credits will be allowed to transfer as humanities if the community college defines them as humanities. Transfer credit in the natural sciences must be for a laboratory science under these circumstances. In contrast, students transferring courses without an associate degree, or from an institution other than a Michigan community college, will have to meet the more stringent requirements and definitions of the general education requirements at LSSU.

Twenty-seven percent of LSSU's students are from Canada. Some Canadian students have previously earned grade 13 credit, or Ontario Advanced Credits (OACs), which transfer, in part, for general education requirements. Other Canadian students transfer from Ontario's Colleges of Applied Arts and Technology. The secondary and postsecondary education of students from the latter institutions generally is more vocational in orientation and, as a consequence, most of their general education courses are taken at LSSU.

The latitude afforded students with regard to the manner in which they satisfy the distribution requirements described above is obvious. The differences that are possible in the general education experiences of transfer and nontransfer students under these conditions are apparent.

For purposes of this study, *courses* were classified as humanities, social science, or natural science using the LSSU classification for credit earned at LSSU and the classification used by the Registrar when credits are transferred. Employing this definition, a course in western civilization would be social science if taken at LSSU, or if transferred by a student without an associate degree, but it would be counted as a humanities course at LSSU if transferred by a student with an associate degree from a Michigan community college that classifies it as humanities.

Other Barriers to a Common Experience

Scheduling problems, of the student's own making because of personal preferences or commitments, or due to institutional constraints, create additional barriers toward the goal of providing a common general education experience. Designation of courses to be used to meet general education requirements by major or minor degree programs limits student options, and such constraints result in different general education experiences.

Research Questions

A purpose of the researcher in this study was to describe which courses students at LSSU select to meet distribution requirements in the humanities, social sciences, and natural sciences. If one purpose of general education is to achieve breadth, information is needed about the credits earned in each of the distribution areas. More specifically, answers to the following questions were sought of 1990-91 baccalaureate graduates of LSSU:

1. What was the mean number of credits earned in each of the academic disciplines, or in survey sequence courses, to meet the LSSU requirements in the humanities, social sciences, and natural sciences?

2. What was the mean number of credits earned in humanities, social science, and natural science by degree area of students, and were differences significant?

3. What was the mean number of credits earned in humanities, social science, and natural science by gender of students, and were differences significant?

4. What was the mean number of credits earned in humanities, social science, and natural science by transfer/nontransfer status of students, and were differences significant?

5. What was the mean number of credits earned in humanities, social science, and natural science by traditional/nontraditional age status of students, and were differences significant?

6. What was the mean number of credits earned in humanities, social science, and natural science by students based on the country in which secondary education was received, and were differences significant?

Data with regard to the foregoing six questions provided a descriptive profile of the courses taken by LSSU undergraduate students to meet general education distribution requirements. These data addressed how many credits were earned in broad distribution areas and what differences existed by degree area, gender, age, transfer status, and country in which the secondary education was received. Examination of these data permitted comparisons across academic disciplines concerning the ways students satisfied the general education requirements. Comparisons of breadth across major, gender, age, transfer status, and country of secondary education were possible.

Another purpose of the researcher in this study was to determine when in the undergraduate's college progression the general education requirement was satisfied. More specifically, for 1990-91 graduates, the following questions were answered:

7. What was the mean number of credits earned, by degree area of students, when the humanities, social science, and natural science requirements were met, and were differences significant?

8. What was the mean number of credits earned, by transfer/nontransfer status of students, when the humanities, social science, and natural science requirements were met, and were differences significant?

9. What was the mean number of credits earned by students, based on the country in which the secondary education was received, when the humanities, social science, and natural science requirements were met, and were differences significant?

10. What was the mean number of credits earned, by gender of students, when the humanities, social science, and natural science requirements were met, and were differences significant?

11. What was the mean number of credits earned, by age of students, when the humanities, social science, and natural science requirements were met, and were differences significant?

Investigation of these questions permits the development of educational policy proposals that are sensitive to the timing and sequencing of general education experiences as a function of transfer status, major, gender, age, and country in which secondary education was received. Such sensitivity may have an effect on both enrollment management and retention.

The next issue addressed in this study was the persons or factors that influenced selections of courses to meet the distribution requirements. Answers to the following questions were sought:

12. How important was the advice of LSSU faculty advisors or other faculty or staff members to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

13. How important was the advice of students or former students to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

14. How important were publications of the university in assisting students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

15. How important was the reputation of the classroom instructor to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

16. How important was the content of the course or subject matter to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

17. How important was the day of the week or hour of the day the course was scheduled to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

18. How important were scheduling problems beyond the student's control, such as full sections or schedule conflicts, in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

A nondirectional hypothesis of difference was tested for each of these questions using analysis of variance (ANOVA) in the Statistical Package for the Social Sciences for a Personal Computer (SPSS/PC+), version 3.1. The organismic variable was the disciplinary major area of the student. The dependent variables were responses to the seven questions above regarding individuals or factors influencing course selection. Responses were recorded using a five-point Likert scale.

The final area of focus in this study was the evaluation by students of the contributions of general education to their personal and professional lives, and their assessment of whether more or fewer credits should be required in the different areas. The following specific questions were examined:

19. How beneficial to their general development, and to understanding their majors, did students by degree area find courses in the humanities, social sciences, and natural sciences?

20. How beneficial to their general development, and to understanding their majors, did students by gender find courses in the humanities, social sciences, and natural sciences?

21. How beneficial to their general development, and to understanding their majors, did students by transfer/nontransfer status find courses in the humanities, social sciences, and natural sciences?

22. How beneficial to their general development, and to understanding their majors, did students by age find courses in the humanities, social sciences, and natural sciences?

23. How beneficial to their general development, and to understanding their majors, did students by the country in which they received their secondary education find courses in the humanities, social sciences, and natural sciences?

24. Did students by degree area think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

25. Did students by gender think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

26. Did students by age think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

27. Did students by transfer/nontransfer status think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

28. Did students by the country in which they received their secondary education think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

Hypotheses of differences were tested using the same organismic variables discussed above. Students' responses on a five-point Likert scale served as the dependent variables. Mean values of responses were calculated for different groups, and ANOVA tests using SPSS/PC+ were performed. Alpha values of .05 were used. The following differences were hypothesized:

> Hypothesis 1: Students majoring in the natural sciences, mathematics, computer science, engineering technology, and health-related fields will rate natural science courses as more beneficial to their general development and to understanding their majors than will students majoring in other disciplines.

> Hypothesis 2: Students majoring in the social sciences, business, criminal justice, human services, recreation management, and legal assistant studies will rate courses in the social sciences as more beneficial to their general development and to their understanding of their majors than will students majoring in other disciplines.

> Hypothesis 3: Students majoring in social sciences and arts and letters will rate courses in the humanities as more beneficial to their general development and to their understanding of their majors than will students majoring in other disciplines.

> Hypothesis 4: Nontraditional students will rate courses in the humanities as more beneficial to their general development than will other students.

> Hypothesis 5: Students completing their humanities requirements in their junior or senior years will rate courses in the humanities as more beneficial to their general development than will other students.

Table 1 relates the research questions to the issues outlined on pages 6 and 7.

Delimitations

Data were collected from one year's graduating baccalaureate class at LSSU. The findings may not be representative of previous or future classes at LSSU or at other colleges or universities.

The classification of courses selected to meet requirements in each of the three disciplines was based on departmental audit sheets filed with the Registrar. In some cases, students completed the

Table 1.--Issues and research questions.

Issue	Research Question
What courses were selected by students to meet distribution requirements in the humanities, social sciences, and natural sciences?	1. What was the mean number of credits earned in each of the academic disciplines, or in survey sequence courses, to meet the LSSU requirements in the humanities, social sciences, and natural sciences?
How many credit hours were earned in each of the three distributional areas required, i.e., the humanities, social sciences, and natural sciences?	2. What was the mean number of credits earned in humanities, social science, and natural science by degree area of students, and were differences significant?
	3. What was the mean number of credits earned in humanities, social science, and natural science by gender of students, and were differences significant?
	4. What was the mean number of credits earned in humanities, social science, and natural science by transfer/nontransfer status of students, and were differences significant?
	5. What was the mean number of credits earned in humanities, social science, and natural science by traditional/nontraditional age status of students, and were differences significant?

Table 1.--Continued.

Issue	Research Question
	6. What was the mean number of credits earned in humanities, social science, and natural science by students based on the country in which secondary education was received, and were differences significant?
How many credit hours were accumulated when distribution requirements in general education were met?	7. What was the mean number of credits earned, by degree area of students, when the humanities, social science, and natural science requirements were met, and were differences significant?
	8. What was the mean number of credits earned, by transfer/nontransfer status of students, when the humanities, social science, and natural science requirements were met, and were differences significant?
	9. What was the mean number of credits earned by students, based on the country in which the secondary education was received, when the humanities, social science, and natural science requirements were met, and were differences significant?

Table 1.--Continued.

Issue	Research Question
	10. What was the mean number of credits earned, by gender of students, when the humanities, social science, and natural science requirements were met, and were differences significant?
	11. What was the mean number of credits earned, by age of students, when the humanities, social science, and natural science requirements were met, and were differences significant?
What factors or individuals were important in assisting students to make their selection of courses to meet distribution requirements?	12. How important was the advice of LSSU faculty advisors or other faculty or staff members to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?
	13. How important was the advice of students or former students to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?
	14. How important were publications of the university in assisting students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

Table 1.--Continued.

Issue	Research Question
	15. How important was the reputation of the classroom instructor to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?
	16. How important was the content of the course or subject matter to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?
	17. How important was the day of the week or hour of the day the course was scheduled to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?
	18. How important were scheduling problems beyond the student's control, such as full sections or schedule conflicts, in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?
What were the students' perceptions of the benefit of courses in the three distributional areas to their personal development and in understanding their majors?	19. How beneficial to their general development, and to understanding their majors, did students by degree area find courses in the humanities, social sciences, and natural sciences?

Table 1.--Continued.

Issue	Research Question
	20. How beneficial to their general development, and to understanding their majors, did students by gender find courses in the humanities, social sciences, and natural sciences?
	21. How beneficial to their general development, and to understanding their majors, did students by transfer/nontransfer status find courses in the humanities, social sciences, and natural sciences?
	22. How beneficial to their general development, and to understanding their majors, did students by age find courses in the humanities, social sciences, and natural sciences?
	23. How beneficial to their general development, and to understanding their majors, did students by the country in which they received their secondary education find courses in the humanities, social sciences, and natural sciences?
Did students indicate that credit hour requirements in each of the three distributional areas should be increased, decreased, or remain unchanged?	24. Did students by degree area think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

Table 1.--Continued.

Issue	Research Question
	25. Did students by gender think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?
	26. Did students by age think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?
	27. Did students by transfer/nontransfer status think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?
	28. Did students by the country in which they received their secondary education think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

audit sheets, which were subsequently reviewed by the advisor, department head, and Registrar. In other situations, department heads or faculty advisors completed the forms. Audit sheets for most degree programs specified courses "selected" to meet requirements, especially in distributional fields outside the field of the major. Where more than the minimum number of credits was taken in a distributional area, the specification of courses as "selected" was arbitrary. The student, if asked, may have provided a different set of courses than those listed on the audit sheet. As an operational definition of courses meeting the general education requirements, this researcher used those courses listed in the designated general education category on the audit sheet. This determination was made because the department involved required those courses to be completed. Students could meet degree requirements with those specific courses and not with other selections. The existence of alternative means of specification of general education courses selected, such as using students' responses or using the first 12 credits listed on the transcript, limits the generalizability of the results.

The interview protocol asked the same set of questions three times: once for each of the three distributional areas of the humanities, social sciences, and natural sciences. The redundancy was tedious for both interviewers and respondents. Moreover, the responses to the first set of questions might have influenced responses to the questions when they were repeated for other distributional areas. Reliability may be reduced accordingly. The use of a larger response sample to allow asking each respondent one set of questions was deemed impractical.

The lapse of time between the completion of distributional requirements by students and the interview may have resulted in incomplete or inaccurate recall of the importance of factors or persons in influencing choices. Students may not have responded honestly, even to student interviewers.

The number of degrees awarded during 1990-91 in certain programs was small: three in mathematics, seven in English language and literature, eight in history, and five in geology. Some department totals (which include several degree programs) were small: 15 in Arts and Letters and 19 in Mathematical, Computer, and Geological Sciences. To overcome problems of sampling from these small programs and departments, the researcher made assumptions about similarities among students in degree programs and consolidated the degree programs into five groups. Although this action increased the sample size of each newly defined degree group, differences among the different degree programs may appear smaller because each group was more heterogeneous than a single degree or program. When students from different degree programs were grouped together, their distinctive characteristics and responses were less observable, and the group means were closer to the average for all students.

Limitations

The results of this study apply to graduates of LSSU. The demographic characteristics of LSSU students are different from those of students at most other institutions in the state. The choices, factors affecting those choices, and evaluation of general education by LSSU students likely differ from the factors influencing students at other institutions, their choices, and evaluations of general education. These differences are not likely as great when data are compared at the disciplinary-group level. The methods used in this study can be replicated, with appropriate modifications, at other universities to answer similar questions.

CHAPTER II

PRECEDENTS IN THE LITERATURE

This chapter contains a review of the aims, development, and forms of general education as a component of the undergraduate experience. The higher education literature abounds with discussion of the purposes of general education. Themes such as connectedness and integration and phrases such as critical thinking skills and common learning experiences appear frequently.

Evaluation and reform of general education is a continuous process for institutions of higher learning. Evaluation models and methodology are reviewed in the second part of this chapter. Procedural precedents for the methodology used in this study are noted.

General Education

Among the eight points of tension that Boyer (1987) found on the campuses of American colleges and universities was confusion over goals.

> Scrambling for students and driven by marketplace demands, many undergraduate colleges have lost their sense of mission. They are confused about their mission and how to impart shared values. . . . And colleges appear to be searching for meaning in a world where diversity, not commonality, is the guiding vision.
>
> Closely related is the conflict between careerism and the liberal arts. Today's students worry about jobs. Narrow

> vocationalism, with its emphasis on skills training, dominates the campus. . . . [As one] president observed, "It's all right to talk about liberal arts goals but we have to face up to what students want today." (pp. 3-4)

Boyer "found renewed interest in general education, in the quality of teaching, and in the evaluation of the undergraduate experience" (p. 7). The points of tension were also points of opportunity.

Historical Development of General Education

The confusion over goals to which Boyer referred "reflects a search for meaning within this new paradigm [of the Technological Revolution]" argued Miller (1988) in The Meaning of General Education (pp. 1-2). Miller argued that the Industrial Revolution has been succeeded by the Technological Revolution, with new economic, social, and political rules no one knows how to teach. General education has become the catalyst for curricular innovation as colleges try to deal with the paradigm shift. Confusion over the meaning of general education has hampered serious discussion.

Miller (1988) described general education as follows:

> General education is a comprehensive, self-consciously developed and maintained program that develops in individual students the attitude of inquiry; the skills of problem solving; the individual and community values associated with a democratic society; and the knowledge needed to apply these attitudes, skills and values so that the students may maintain the learning process over a lifetime and function as self-fulfilled individuals and as full participants in a society committed to change through democratic processes. As such, it is marked by its comprehensive scope, by its emphasis on specific and real problems and issues of immediate concern to students and society, by its concern with the needs of the future, and by the application of democratic principles in the

> methods and procedures of education as well as the goals of education. (p. 5)

Boyer (1987) traced the development of general education and described the goals of an effective college as flowing from the needs of society and from the needs of students, in terms of two powerful traditions, individuality and community (pp. 58-69). The earliest colleges in America provided a common, classical curriculum. These institutions sought "to develop a sense of unity where, in a society created from many of the nations of Europe, there might otherwise by aimlessness and uncontrolled diversity" (Rudolph, cited in Boyer, 1987, p. 60). After the American Revolution, minds turned toward the future, and the mood of individualism was reflected on campus. New courses were added. Students from less privileged backgrounds were admitted. Colleges began to offer professional education. The Land Grant Act of 1862 wedded higher education to the practical arts.

Charles Eliot moved Harvard to an elective curriculum. He is quoted by Boyer (1987) as stating the following in his 1869 inaugural address:

> The endless controversies whether language, philosophy, mathematics, or science supplies the best mental training, whether general education should be chiefly literary or chiefly scientific, have no practical lesson for us today. This university recognizes no real antagonism between literature and science, and consents to no such narrow alternatives as mathematics or classics, science or metaphysics. We would have them all, and at their best. (p. 63)

The abandonment of the classical curriculum led some educators to worry about the lack of coherence. At Harvard, distribution requirements were introduced by Eliot's successor, Lawrence Lowell.

Distribution requirements represented a compromise between the old classical core and the free elective system. Revival of general education requirements, in the form of survey courses and Great Books curricula after World War I, and in the form of western civilization sequences and programs with validity for a free society after World War II, illustrate the choices colleges must make between individualism and the needs of society. The two powerful traditions to which Boyer referred--individuality and community--have defined "the boundaries of the collegiate debate about purposes and goals and within these traditions there is, perhaps, sufficient common ground on which a vital academic program can be built" (pp. 66-67).

Miller (1988) argued for a different approach to the question of balance than the balance between individuality and community to which Boyer referred. Citing Ferguson, Miller stated, "The person and society are yoked, like mind and body. Arguing which is more important is like debating whether oxygen or hydrogen is the more essential property of water" (pp. 5-6). General education represents a third option, according to Miller, "that recognizes and builds on this inseparable relationship between the individual and community." This option "offers a way of articulating a curriculum that can meet the challenges facing postindustrial society." Miller traced the development of general education through history to explain the third option.

General education in the nineteenth century. In the nineteenth century, the propriety of classical education was challenged within a democracy. Citing Tocqueville, Miller (1988) explained how colleges and universities responded to the need to prepare Americans for professions and vocations.

> In America there are but few wealthy persons; nearly all Americans have to take a profession. Now, every profession requires an apprenticeship. The Americans can devote to general education only the early years of life. At fifteen, they enter upon their calling and thus their education generally ends at the age when ours begins. If it is continued beyond that point, it aims only toward a particular specialized and profitable purpose; one studies science as one takes up a business; and one takes up only those applications whose immediate practicality is recognized. (p. 8)

General education became a reform movement, responding to the controversy that was already evident when Tocqueville visited in 1831. Miller said that American colleges resisted, successfully for almost two centuries, pressure to make education responsive to vocational needs of students and society. The forces of the American Revolution and the Industrial Revolution re-formed higher education. The Yale Report of 1828 represented the view that the same education should be offered to all students to prepare them for citizenship. By the end of the Civil War, the utilitarian movement and the influence of the German university, with its emphasis on research, brought profound change to American higher education (Miller, 1988).

The United States, by the end of the Civil War, was becoming an industrial power. Pressure mounted to make the curriculum more vocational and more utilitarian. The free elective system instituted by Charles Eliot at Harvard was revolutionary. The land grant movement was a further stimulus to change in this direction. At Cornell University, a curriculum was developed by President White based on divisions and departments. At the University of Wisconsin, faculty members served as experts in a statewide extension service. Greater emphasis was being placed on professional education and specialization. Graduate education developed and changed the orientation of undergraduate instruction from general studies to preprofessional instruction. The influence from German universities fostered the development of the research mission of the university with concomitant greater specialization and fragmentation of the curriculum and development of a laissez-faire attitude toward students by faculty members (Miller, 1988).

A number of attempts at curricular reform occurred around the turn of the century. Miller (1988) cited the culture movement as an example of a group that was opposed to "materialistic vocationalism and to social scientists who had come to dominate the utility movement. Members of the culture movement also were opposed to the narrow intellectualism they felt had become associated with scientific research" (p. 19). The culture movement was strongest in departments of modern languages, English literature, philosophy, and the arts and was concerned with aesthetics, ethics, and artistic taste and appreciation. The culturists shared with the classicists a concern about the structure of curriculum, centered on the unity of study. Culturists actively supported a prescribed curriculum.

Other early attempts at reform included the development of majors or concentrations in an attempt to provide coherence to the curriculum, and the development of honors programs. At Princeton, Woodrow Wilson adopted the preceptor system in an attempt to gain control over extracurricular activities which were deemed anti-intellectual. Colleges began to change the content of the curriculum, as well as the structure, to respond to changing student bodies and changing social problems (Miller, 1988).

The social context in which these curricular changes were occurring was one of transformation. Not only was the United States developing into a premier industrial power, but the country was becoming an urban society. The development of the middle class was accompanied and assisted by newspapers and magazines, which helped Americans see themselves as middle class and caused rising expectations. Raised expectations were accompanied by a sense of individual social responsibility and led to social reform movements. At the end of World War I, idealism was replaced with disillusionment, except in higher education.

The reform movement in education was accompanied by growth in enrollment. The problem of dealing with larger numbers of students, who were generally different from traditional students, and the problem of how to apply the resources of the college to make a new world were not unrelated. Out of these problems, the general education movement developed (Miller, 1988).

The humanist approach. One approach to general education developed out of the classical tradition and the culture movement.

The humanist approach to general education evolved from "naturalistic" humanism. Naturalistic humanism differs from traditional humanism in that it placed human beings at the center and stressed personal responsibility for behavior.

> Naturalistic humanism involves the development of *individual values* as a means to achieve *social ends* of a sort much broader than those of the traditional humanists. The naturalists also abandoned the classical authors as the sole authority for those values and became more concerned with the present. (Miller, 1988, pp. 34-35)

Miller (1988) cited the Contemporary Civilization program at Columbia College and the work of Alexander Meiklejohn in establishing the Experimental College at the University of Wisconsin as examples of general education that drew upon the approach of naturalistic humanism. The Contemporary Civilization sequence at Wisconsin developed out of a War Issues course developed for the War Department before the conclusion of World War I. A group of faculty began to develop a Peace Issues course to ease the transition of students from war to peace. This course became Contemporary Civilization. The interdisciplinary course was required of all freshmen. The emphasis was on "the development of a student's ability to *apply* learning to current *problems* and to make informed *judgments*" rather than on the acquisition of knowledge in traditional discipline areas (p. 36). Equally important was the emphasis on contemporary problems rather than western cultural heritage.

Miller (1988) described Meiklejohn as eclectic in his approach. While Meiklejohn remained loyal to many basic assumptions of traditional humanism, he brought new ideas from naturalistic humanism to the curriculum, and these were important in the development of general education. Meiklejohn believed the goal of education was the training of a student's mental faculties through discipline. Form was separate from content. This formalism was basic to the classical curriculum. Meiklejohn (cited in Miller, 1988) believed that "the old curriculum was founded by men who had a theory of the world and of human life. They had a knowledge of human experience by which they could live and which they could teach others engaged in the activities of living" (p. 42).

Meiklejohn's philosophy was that the experience of the past could help students cope with the problems of the present. For Meiklejohn, the absence of a national mind was a danger to democracy in the years following World War I. At the University of Wisconsin, Meiklejohn established a program with the goal of "teaching general intelligence" (Miller, 1988, p. 45). Intelligence was defined as "readiness for any human situation: it is the power, wherever one goes, of being able to see, in any set of circumstances, the best response which a human being can make to those circumstances." The approach used by Meiklejohn was to study two civilizations--one ancient and one modern--to provide understanding of what constitutes a civilization and to learn to apply these insights to contemporary problems. He sought to avoid reliance on discipline-based knowledge and to avoid the question of ends versus means. While he retained the formalism of the classical curriculum, the study of the humanities was not "for their own sake, but for a holistic understanding of the relationships that are involved in a human community" (p. 44).

Miller (1988) contrasted the efforts at Columbia and Wisconsin with the curricular reforms of Robert Maynard Hutchins at the University of Chicago to support his thesis that the former were representations of new and distinct curricula rather than reforms within the traditional structure of liberal education. Hutchins believed that a love of money which had fostered vocationalism, a confused notion of democracy which had made education too responsive to social problems, and an erroneous notion of progress had created an anti-intellectual university. Hutchins's response was the Great Books program (Miller, 1988).

The progressive education movement. The second approach to general education developed out of the progressive education movement and the philosophy of pragmatism. Miller (1988) described the philosophy of pragmatism as uniquely American, reflecting and growing out of the experiences of the frontier in the late nineteenth century.

> [Pragmatism] was shaped by the same forces that were re-forming American life at the end of the Industrial Revolution; pragmatism reflected the vitality in American life and, at the same time, made an active contribution to that vitality. As such, pragmatism owed little allegiance to the rationalist tradition of Europe; in fact, it is rooted in opposition to that tradition. Its founders were very conscious of a direct relationship between pragmatism and the American brand of political and social democracy. They wanted a philosophy that would help insure that the vitality of American culture was maintained. (p. 55)

Pragmatism was part of a general revolt against formalism and contributed to the notion that social arrangements were "products of a society in which institutions were constantly created and re-created. As a result, the society was oriented to the future rather than to the past" (Miller, 1988, p. 57). The future could be changed just as the frontier was transformed. Miller (1988) stated, "John Dewey transformed pragmatism into instrumentalism, in the process giving the basic elements of pragmatism a distinctly social meaning and applying them to education" (pp. 58-59).

> I became more and more troubled by the intellectual scandal that seemed to be involved in the current (and traditional) dualism in logical standpoint and method between something called "science" on the one hand and something called "morals" on the other. I have long felt that the construction of a logic, that is, a method of effective inquiry, which would apply without abrupt breach of continuity to the fields designated by both of these words, is at once our needed theoretical solvent and the supply of our greatest practical event. This belief has had much more to do with the development of what I termed, for lack of a better word, "instrumentalism," than have most of the reasons that have been assigned. (Dewey, cited in Miller, 1988, p. 61)

"Dewey's goal was use of scientific processes to create social change" (Miller, 1988, p. 62). Dewey wanted to empower individuals to solve social problems by transforming the environment. Inquiry was an instrument of transformation. To acquire knowledge, the individual had to participate and to perceive the relationship between action and changes in the environment. Action was to be purposeful and to be based on reflection.

Dewey (cited in Miller, 1988) saw a close relationship between pragmatism and democracy:

> The very idea of democracy, the meaning of democracy, must be continually explored afresh. It has to be constantly discovered and rediscovered, remade and reorganized; while the political and economic and social institutions in which it is embodied have to be remade and reorganized to meet the changes that are going on in the development of new needs on the part of human beings and new resources for satisfying those needs. (p. 63)

Education was at the center of Dewey's conception of pragmatism. Education could not be separated from the process that defined pragmatism. Education was a continuous process of growth, not a preparation for a profession or a preparation for life. Dewey defined education as "that reconstruction or reorganization of experience which adds to the meaning of experience" (Miller, 1988, p. 65). "The educational process has no end beyond itself; it is its own end." The three components of the process are reorganizing, reconstructing and transforming. Deliberate change in the environment is intended. Ends, or aims as Dewey called them, are the same as means. Continuous growth, as the aim of education, implies that education is a lifelong process. Education must be concerned with the present problems of the learner if the growth of the learner is to be challenged. Dewey rejected the separation of subject matter from educational methods. Subject matter is a resource to help students solve problems of immediate concern. "The knowledge of the past becomes a means for understanding the present and creating the future" (Miller, 1988, p. 67).

Dewey's work stimulated the progressive education movement. Tensions developed between those who advocated a child-centered curriculum and those who advocated a social reconstructionist curriculum. The child-centered curriculum developed out of the measurement movement. If intelligence and aptitude could be measured, educational programs could be constructed for each individual student. The child-centered approach was well suited for the 1920s with its emphasis on individualism. With the Great Depression and the growth of fascism, attention turned to the school's role in society. The social reconstructionist curriculum understood democracy to be a classless and collectivist society. The issue was the relationship between the needs of the individual and the role of education in bringing about social change. Dewey saw these two issues as two sides of the same coin. Despite differences among Dewey's followers, the progressive educators held in common the view that education and democracy were intertwined concepts. As such, educators had to be concerned with the role of the individual in society because that relationship defines a democracy. The contribution of progressive education to general education was the premise that "education designed to help individuals become capable citizens of a democratic community must involve them in direct experience with issues of immediate interest. . . . Such an education is inescapably concerned with individual and social transformation--with change" (Miller, 1988, p. 78).

The postwar years. The unity of process and substance present in the instrumentalist approach and in the vision of democracy held by its advocates--the unity of ends and means--was less visible in the years following World War II. The founders of the general education movement viewed democracy as a process. In the postwar society, democracy was perceived as an institution. Preservation of democracy became the goal of education. The relationship of the individual to society changed from one where the concern was with the process of change to one where the concern was with the individual's civic responsibilities to society. To the progressives, the process of the curriculum had implications for the substance of the curriculum. The unity of ends and means flowed from this process-oriented view of democracy. The postwar view of democracy, by contrast, did not foster a concern with methods.

Established institutions, such as Harvard, had to deal with their own history. Confusion between general education and liberal education developed as such schools tried to deal with the contradictory assumptions and demands of both. As the view of democracy shifted from the transformation of the individual to the preservation of institutions, Harvard faculty tried to reconcile the instrumentalist philosophy of change with the heritage of shared values. Harvard's Committee on the Objectives (cited in Miller, 1988) attempted to strike the balance:

> Education can therefore be wholly devoted neither to tradition nor to the belief that the ideal in itself is enough nor to the view that means are valuable apart from the ideal. It must uphold at the same time tradition and experiment, the idea and the means, subserving, like our culture itself, change within commitment. (p. 136)

Harvard's curricular changes resulted in more prescription. Heritage overpowered change. By trying to strike a balance between the goals of instrumentalism and classical humanism, the committee missed the spirit of both according to Miller (1988):

> Harvard's attempt to institutionalize general education illustrates the problem that many of the elitist, four-year institutions had in trying to introduce general education concepts into an institutional setting that had developed around an entirely different set of assumptions. It reflects the dilemma facing the traditionally elitist institutions as they tried to respond to the democratization of education and to the new relationship between education and society that developed in the postwar years. (p. 139)

At Michigan State College, a land grant institution serving a very different student from the student attending Harvard, a discussion began in 1943 of the type of education the institution wanted to offer students after the war ended. The faculty decided by unanimous vote to create a Basic College, later known as the University College, for every freshman and sophomore. The program would be under the supervision of a separate faculty, and every student would take the core courses. Michigan State, unlike Harvard, was not hindered by its history and its traditions so it could bring about change more easily. Its faculty had enough confidence to do what they believed to be in the best interest of Michigan State without undue concern about the opinions or actions at other, more prestigious institutions. John Hannah (1980) recalled:

> Our people became convinced that what other universities were doing might be interesting, but not necessarily right for Michigan State. But the old [Michigan Agricultural College] attitude was well exemplified by the distinguished professor of botany, Dean Ernst Bessey, who repeatedly at faculty meetings would ask the question, "Is there precedent for this?" And if Chicago or Michigan or Harvard or Stanford was doing something that we suggested, why, of course, that was all right. But if there was not an example somewhere else, if a so-called major university was not doing exactly what we had proposed, then in the view of Dr. Bessey and others, it should be forgotten.

> M.S.C. had overcome that attitude by the postwar years. . . . Our faculty was convinced that if they tried to out-Harvard Harvard, they were not going to succeed. And if they were not careful, they might find in the process that the objectives Michigan State had been designed for would not be achieved. Our university had reached the point where it could move in the direction it should to become truly distinguished. (p. 51)

The forces behind the general education movement at Michigan State included greater access and the larger number of students to be served after World War II, and the fact that many of these students would be from families where they were the first generation to be exposed to higher education. High school preparation could not be assumed to be universally strong. Hannah argued that the free elective system prevalent in higher education had made it possible for a person to gain a college degree and know a great deal about very little. For this reason, the decision was made at Michigan State to require the Basic College program of all students, irrespective of the major.

The land grant tradition at Michigan State University made the development of a general education program easier than it would have been at a liberal arts school. Griffith (1947) discussed the changing structure of higher education. The land grant tradition, along with the liberal arts tradition and the tradition of the professions, is one of three bases of structure for the university. Writing in 1947, Griffith cited a vast increase in the number of students seeking higher education and the creation of a variety of new professions that require different abilities and education as forces for change. Griffith distinguished between horizontal and vertical instruction and research. Horizontal instruction and research is organized across department and school lines and is designed to satisfy the life-activities of several classes of people. Griffith argued that the land grant and professional strands of education are based on horizontal organization, whereas liberal arts education is organized vertically, or in a ladder fashion.

Plans and priorities for general education were identified by Griffith (1947) as one of five adjustments needed in higher education:

> The reason for interest in, and genuine distress about, general education is plain enough. . . . Most programs of general education have spring [sic] up more as a reaction against the ladder-like structure of training programs which lead to the doctorate than as positive and aggressive plans for finding within the welter of current knowledge that common core of information and that central means of promoting mental growth which somewhere, somehow, must be essential features of any program of general education.
>
> A program of general education for our colleges and universities is not, and cannot be, simply a matter of shuffling large numbers of specialized courses and then dealing them out in the hope that a good game, whose rules are not yet known, can be played. . . . Understanding implies, of course, a common core of knowledge, but it also implies a rising level of ability. . . . The rise in ability must be so universal that the gap between the best-informed and the least-informed is diminished rather than increased. This may be an impossible goal for an educational system of a democracy, but the unique thing about a democracy is that it has done, and if it survives, it will continue to do, the impossible. . . . The means of doing the impossible is a national system of education within whose structure will be found . . . a program of general education. (pp. 13-14)

Within the traditions described by Griffith, the general education movement found a more comfortable home in institutions with the land grant philosophy than in liberal arts colleges.

The major innovation during the 1940s and 1950s, according to Miller (1988), was the contribution of the newly developing community colleges. Their community-centered curriculum developed a balance between the interests of the individual and the interests of the community. Miller cited the community college experiences in California and Iowa to illustrate this contention.

Although no clear vision of general education emerged nationally during the postwar years, general education did become part of the mainstream rather than a movement separate from the mainstream. During this period, the pendulum swung away from the individual toward the community.

The 1960s and individualism. The 1960s and 1970s witnessed a return to individualism. The curriculum became more student centered and future oriented again. Institutions were becoming more diverse to serve a more diverse and larger student population by providing more diverse, more technical, and more vocational programs. While increased diversity resulted in more specialization and fragmentation of the curriculum and worked against general education in some ways, it simultaneously increased the interest in general education as a means of bringing order to the process of change brought on by the knowledge explosion.

Student unrest, in part a consequence of the loss of community on the campuses of large universities, served to create a new sense of community and forced universities to take curricular action and incorporate some of the ideas for the revision of general education held by student activists. Miller (1988) cited part of the "Port

Huron Statement," written for the first meeting of the Students for a Democratic Society, as an example of the thinking of mainstream student movements: "We are people of this generation bred in at least modest comfort, housed now in universities, looking uncomfortably to the world we inherit." Racial bigotry and "the enclosing fact of the Cold War, symbolized by the presence of the Bomb," caused their discomfort. "The vital democratic connection between community and leadership . . . has been so wrenched and perverted that disastrous policies go unchallenged time and again" (p. 148). The language of this statement is reminiscent of the work of Dewey.

The general education paradigm. At Columbia University, Daniel Bell began his reconsideration of general education. Bell noted several trends that would affect general education: the development of a national economy with the government as the major funding sources for research, the knowledge revolution, the developing future orientation and planning of society, and the prizing of intellectual achievement. Public service, as defined by research activity, was becoming paramount to the university as a consequence of these trends. Faculty members were identifying with their disciplines rather than their institutions, with graduate education rather than undergraduate instruction. While the university's future orientation and emphasis on planning, and the focus on a national community, were positive forces for highlighting the value of general education, the increased disciplinary fragmentation and the orientation of faculty toward graduate education were detrimental to the development of general education (Miller, 1988).

Bell believed the distribution system or traditional liberal arts curriculum would not meet the needs for general education. Bell believed the distinction between general and specialized education was wrong. He argued for movement away from a knowledge-based curriculum to a system that focused on methods "and on meaningful problems and moral choices that students would encounter in their professional lives. He defined general education as 'education in the conduct and strategy of inquiry itself'" (Miller, 1988, pp. 154-155). Bell believed that general education required vertical, as well as horizontal, integration and should not be confined to the first two years of undergraduate instruction.

Miller (1988) said the confusion over general education is so great that perhaps there is no such thing as a single general education paradigm. He suggested that this lack of a unifying theme is paralyzing in its effect on the curriculum. A common understanding of general education is essential for the development of a general education curriculum. Miller concluded that general education is not liberal education, nor is general education the same thing as interdisciplinary study. The relationship between interdisciplinary study and general education rests with purpose and the treatment of the content, not with the content per se. General education is not the same thing as undergraduate education, nor is it synonymous with a prescribed curriculum.

Having said what general education is not, Miller (1988) concluded with what he believed it is. General education is purposeful. "The ends--the stated purposes--of general education guide every aspect of the curriculum." Evaluation is a part of this characteristic. General education is comprehensive. "It gives equal weight to the goals, the procedures or methods, and the content of the curriculum. . . . General education is intimately concerned with democratic processes and with the needs of a democratic society and it always has been" (pp. 186-190). Miller thought it was hard to think of a time and a set of circumstances when the need for general education could be greater.

> [It is] essential that colleges and universities tackle the issue of general education and try to arrive at a community of shared understanding that will make possible the development of coherent general education curricula that respond to the needs of both individuals and democratic society in a time of change. (Miller, 1988, p. 190)

Goals of General Education

Boyer (1987) argued that "general education is not complete until the subject matter of one discipline is made to touch another . . . and the core program must be seen ultimately as relating the curriculum consequentially to life" (p. 91). Boyer suggested the integrated core as a means to allow graduates to "place their knowledge and lives in perspective" (p. 91). He proposed seven areas of inquiry to relate the curriculum to experiences common to all people (p. 92):

Language:	The Crucial Connection
Art:	The Esthetic Experience
Heritage:	The Living Past
Institutions:	The Social Web
Nature:	Ecology of the Planet
Work:	The Value of Vocation
Identity:	The Search for Meaning

Boyer (1987) illustrated the themes of the seven areas with examples of courses and sequences from numerous institutions. He cautioned the reader not

> to slip existing courses into a general education curriculum unexamined. . . . The way the course is actually taught may, in fact, promote specialized, not general, education. The central question is . . . whether students are helped to see integration across the disciplines and discover the shared relationship common to all people. (p. 100)

Boyer (1987) made the point that general education is not just a set of courses, but it is a program that includes the extracurricular. He argued for vertical integration. General education is not something to get out of the way but should extend through all four years. Boyer argued for the joining of general education and specialization in his proposal for the enriched major. General and specialized education should be viewed as contributing to the same end. Citing Alfred North Whitehead, Boyer argued that the goals of general education can be accomplished through the major:

> . . . There can be no adequate technical education which is not liberal, and no liberal education which is not technical. . . . Education should turn out the pupil with something he knows well and something he can do well. (p. 112)

Bok (1986) described three issues in liberal arts education: prescription versus choice, the means used to provide breadth in education, and the means used to achieve integration. He saw three developments in the evolution of general education as being important over the last 75 years. First is the greater complexity of knowledge. Second is the increase in extracurricular activities, which has expanded the influence of the college over every aspect of the students' lives. Third is the greater diversity of the student body in terms of economic status, minority status, gender, and age. Bok stated the following as goals:

> Undergraduates should acquire an ample store of knowledge, both in depth, by concentrating in a particular field, and in breadth, by devoting attention to several disciplines. They should gain an ability to communicate with precision and style, a basic competence in quantitative skills, a familiarity with at least one foreign language, and a capacity to think clearly and critically. Students should also become acquainted with the important methods of inquiry and thought by which we acquire knowledge and understanding of nature, society, and ourselves. They should develop an awareness of other cultures with their differing values, traditions, and institutions. By having a chance to explore many opportunities, they should gain in self-knowledge, and ultimately be able to make sound choices about their future lives and careers. Through working and living with a wide variety of fellow students, they should achieve greater social maturity and acquire a tolerance of human diversity. Last but not least, they should enjoy their college years or at least look back on them later as a time when their interests and enthusiasms were engaged in a particularly memorable way. (pp. 54-55)

Gaff (1983) stated that, despite the simplicity of the term, general education is an ambiguous concept. He drew on four distinctive philosophical approaches to explain the debate about general education. Idealism, as exemplified by John Henry Newman, argues that the university is a center for teaching and learning. Within a community of scholars, activities take place to prepare students for life, not for a particular vocation or profession. Research is alien to this world, as is activity aimed at curing social ills. The goal is liberal education. Humanistic study is the best way to prepare for life.

Progressivism is exemplified by Whitehead and Dewey. No essential difference exists between specialized and general study; a complete education contains both.

The essentialist perspective is identified with Hutchins. The goal of education is to train the intellect, and the study of great books is the best way to do this. Universities were viewed by Hutchins as too narrow, too specialized, too vocational, and too concerned with the extracurriculum.

Pragmatism is the final philosophical position discussed by Gaff. Clark Kerr is a representative of this perspective. Kerr suggested modest improvements in undergraduate education, not radical restructuring. David Riesman is another incrementalist. He is quoted as saying, "I'm proud to be a tinkerer. That's all one is likely to be able to do" (Gaff, 1983, p. 6).

Although the members of these different schools differed in significant ways, Gaff (1983) culled the following as representations of general education with which all could agree. General education:

> is rooted in the liberal tradition and involves study of the basic liberal arts and sciences;
>
> stresses breadth and provides students with familiarity with various branches of human understanding as well as the methodologies and languages particular to different bodies of knowledge;
>
> strives to foster education, synthesis, and connectedness of knowledge rather than discrete bits of specialized information;

> encourages the understanding and appreciation of one's heritage as well as respect for other people and cultures;
>
> includes an examination of values--both those relevant to current controversial issues and those implicit in a discipline's methodology;
>
> prizes a common educational experience for at least part of the college years;
>
> requires the mastery of the linguistic, analytic, critical, and computational skills necessary for lifelong learning; and
>
> fosters the development of personal qualities, such as tolerance of ambiguity, empathy for persons with different values, and an expanded view of self. (p. 708)

The Association of American Colleges, in its 1985 report, <u>Integrity in the College Curriculum</u>, listed the following nine experiences as essential to a coherent undergraduate curriculum:

> 1. Inquiry, abstract logical thinking, critical analysis. How do we know? Why do we believe? What is the evidence? . . . To reason well, to recognize when reason and evidence are not enough, to discover the legitimacy of intuition, to subject inert data to the probing analysis of the mind--these are the primary experiences required of the undergraduate course of study.
>
> 2. Literacy: writing, reading, speaking, listening. . . . A bachelor's degree should mean that its holders can read, write, and speak at levels of distinction and have been given many opportunities to learn how. It also should mean that many of them do so with style.
>
> 3. Understanding numerical data. . . . We are arguing for a recognition throughout the course of study of the necessity for sharpening the ability of students to understand numerical data, to recognize their misuse, the multiple interpretations they often permit, and the ways that they can be manipulated to mislead. . . . In a world of numbers students should encounter concepts that permit a sophisticated response to arguments and positions which depend on numbers and statistics.
>
> 4. Historical consciousness. . . . A consciousness of history allows us to impose some intellectual order on the disorder of random facts. It invites the application of abstract logical thinking, critical analysis, and inquiry to the past, but it

also requires imagination and intuition if the past is going to make sense. . . . To exercise historical consciousness is to stretch the mind and to avoid the pitfalls of oversimplification, shallowness, and unexamined and unchallenged evidence.

5. Science. . . . A person who understands what science is recognizes that scientific concepts are created by acts of human intelligence and imagination; comprehends the distinction between observation and inference and between the occasional role of accidental discovery in scientific investigation and the deliberate strategy of forming and testing hypotheses; understands how theories are formed, tested, validated, and accorded provisional acceptance; and discriminates between conclusions that rest on unverified assertion and those that are developed from the application of scientific reasoning. . . . By demystifying science, to some extent emphasizing the human, social, and political implications of scientific research, such study should lead students to greater resiliency and a greater sense of their own capacity to play a role in how the results of science are used.

6. Values. . . . We may be wary of final answers, but we cannot avoid the necessity of choice, decision, judgment. . . . The opportunities are there, but they are too seldom taken by teachers so far gone into specialization and into the scientific understanding of their specialties that the challenges of bringing students into humanistic relationship with their subjects, into the arena of values and choice and judgment, are beyond their interest and capacity.

7. Art. Appreciation and experience of the fine and performing arts are as essential as any other qualities appropriate to a civilized human being and a democratic society. . . . Without a knowledge of the language of the fine arts, we see less and hear less. Without some experience in the performing arts we are denied the knowledge of disciplined creativity and its meaning as a bulwark of freedom and an instrument of social cohesion. . . . [With the arts] we become less barbaric, more civilized, more fit to be the standard-bearers of a vibrant democratic society.

8. International and multicultural experiences. . . . Colleges must create a curriculum in which the insights and understandings, the lives and aspirations of the distant and foreign, the different and neglected, are more widely comprehended by their graduates.

9. Study in depth. . . . Depth requires sequential learning, building on blocks of knowledge that lead to more sophisticated understanding and encourage leaps of the imagination and efforts at synthesis. . . . The year-long essay, the senior

> thesis, the artistic project, undertaken after a sound grasp of the fundamentals . . . have been established, provides an experience in which two great lessons are learned; the joy of mastery, the thrill of moving forward in a formal body of knowledge and gaining some effective control over it, integrating it, perhaps even making some small contribution to it; and the lesson that no matter how deeply and widely students dig, no matter how much they know, they cannot know enough, they cannot know everything. Depth is an enemy of arrogance. (pp. 15-24)

The Association report placed emphasis on methods of learning rather than content of the curriculum. The report did not propose a prescribed curriculum, nor a mere strengthening of distribution requirements, nor adding multidisciplinary general education courses to the curriculum. The proposal did not envision any single approach to meeting its objectives. The emphasis was on responsibility to the goals of the program rather than the structure of the curriculum along the three traditional lines of the humanities, social sciences, and natural sciences. Responsibility also encompasses responsibility for instruction; the report emphasized the need for active learning.

The 1988 report of the Association of American Colleges, titled <u>A New Vitality in General Education</u>, a follow-up to <u>Integrity in the College Curriculum</u> defined general education "as the cultivation of the knowledge, skills, and attitudes that all of us use and live by during most of our lives--whether as parents, citizens, lovers, travelers, participants in the arts, leaders, volunteers, or good Samaritans" (p. 3). The report emphasized continuous learning and programs "to prevent stagnation of perception and to vivify thought and action through continuous reflection." The report continued:

> The chief task of the college years is for students not only to gain the ability to identify perspectives, weigh evidence, and make wise decisions, but also to learn how to think about thinking and to enjoy thinking. (p. 4)

Rather than focusing on the goals or content of general education, A New Vitality in General Education emphasizes some of the qualities of general education. Despite the diversity of the student body, the report argued for a common learning experience to communicate to students and faculty the fact that they are all part of a community committed to inquiry. Programs should cut across department boundaries. "When we start with departmental turf as our frame of reference, we miss the opportunity to help our students explore potential linkages and complementaries across disciplines and subjects" (p. 7). Students must be helped to see the connections between the content of their study and problems they will face as citizens. Students must be exposed to broad, integrative dimensions in their study in their major. "Whatever their chosen field, study in the major should help students place their particular academic commitments in larger intellectual, historical, and cultural perspectives" (p. 9). Introductory courses in a discipline should be planned and taught with the view in mind that for many students this will be the only course taken. The introductory course should be regarded as a general education course with some guidance provided so students can continue study in the discipline on their own.

Cheney's (1989) 50 Hours, a report from the National Endowment for the Humanities, proposed a core curriculum. The stated purposes for considering a core requirement include increased perspective to aid in making choices, the provision of needed order and coherence, and the encouragement of a sense of community. The report from the National Endowment for the Humanities placed history, literature, philosophy, and art

> at the heart of this curriculum because life lived in their company is richer and fuller than life spent in their absence. . . . The humanities and arts extend our domain. They allow us to reach beyond ourselves as we seek insight--and beyond the present moment. (p. 21)

Two years of foreign language is suggested in the core to increase mastery of the student's own language and to give insight into the nature and power of language. Second, study of a foreign language allows students to "enter into the written culture in significant ways . . . to experience in the original, rather than through translation, profound and beautiful works that show how other people live and what they value" (Cheney, 1989, p. 29). Mathematics would be required in the core for students not majoring in programs requiring mathematics. "To participate rationally in a world where discussions about everything from finance to the environment, from personal health to politics, are increasingly informed by mathematics, one must understand mathematical methods and concepts, their assumptions and implications" (p. 35). Study of the natural sciences is included in the proposed core. "Our ability to make everyday decisions wisely is diminished when we do not comprehend scientific principles and the technologies built upon them. And so is our capacity for answering momentous questions" (p. 43). A one-year course in the social sciences is included "to explain political, economic, and social life" (p. 51). The course would range over the social science disciplines, focusing on works "that established theoretical constructs that have profoundly affected subsequent generations" (p. 52).

Another vehicle for including the goals of general education in the curriculum is to merge them with professional study. Stark and Lowther (1989) outlined ten liberal education outcomes of professional education. These outcomes closely resemble goals of liberal education according to the authors. They include the following:

1. Communication competence--writing, reading, speaking, and listening.

2. Critical thinking--the ability to acquire, evaluate, and synthesize information.

3. Contextual competence--the capability to adopt multiple perspectives and to make judgments in light of historical, social, economic, scientific, and political realities.

4. Aesthetic sensibility--awareness of and sensitivity to relationships among the arts, the natural environment, and human concerns.

5. Professional identity--to strengthen one's place in the world as an individual and citizen.

6. Professional ethics--as standards that guide behavior.

7. Adaptive competence--the ability to anticipate, adapt to, and promote change.

8. Leadership capacity--the capacity to assume leadership roles and to apply knowledge and skills in intelligent and humane ways.

9. Scholarly concern for improvement--recognition of the need to increase knowledge and advance the profession through research on theory and practice.

10. Motivation for continued learning.

Stark and Lowther (1989) surveyed more than 2,000 faculty members in ten professional fields and found the stereotypical view of professional faculty as being educationally narrow to be wrong. Substantial agreement among professional faculty members was found regarding the importance of liberal learning outcomes. While valuing liberal education outcomes, professional faculty did not desire their students to take more liberal arts courses. They believed

> . . . that liberal arts courses, as currently taught, lack relevance, focus, and interest for their students. . . . Only 532 of the 13,461 educational activities faculty mentioned [as activities to achieve liberal education outcomes] entailed course work outside the professional program. (p. 13)

Mohrman (1983) argued that business graduates relied more and more on general education and less and less on specific training as their careers developed. Studies at Chase Manhattan Bank and AT&T found more generally trained liberal arts graduates more successful in management positions than business or engineering graduates. Mohrman made the case for integrating liberal arts studies with more specific skills acquisition.

Putnam and Stevens (1991) argued that management education should be restructured to bring it into the liberal arts tradition. Business schools have already reorganized their curricula along these lines. "Accounting and finance . . . organizational behavior and information systems can be part of the liberal arts tradition if taught in the proper, innovative context" (p. 82).

Martin (1982) made the argument for the synoptic function of the college. He meant that programs of study are comprehensive in the sense that they meet the needs of the whole person, including both general education and professional education. His is an argument for integration:

> . . . blending of themes and subject matter from general and humane studies with those of professional or vocational programs so often substituted for general and liberal education. . . . The college is the place where studies count most when they relate to one another, where skills are acquired and applied not as mere techniques but with concern for their meaning and their effects. (p. 33)

Models of General Education

Cheney (1989) argued that a core curriculum is not limiting, as its critics argue, but it, if "devised so that students encounter classic works and significant ideas, is just the opposite. It expands choices and enriches possibilities for the individual" (p. 59).

Campbell and Flynn (1990) argued for a return to the core curriculum to provide coherence and integration and to restore integrity and purpose in undergraduate education. They stated that

> this suggestion requires a college's faculty to agree on what every student should learn, to create broadly conceived courses including material outside their specialty, and to put student growth before their own academic interests and research. (p. 9)

The authors related how a core curriculum was implemented at Mount Saint Mary's College. The rationale-and-goals statement was approved unanimously by the faculty. While "implementing a core curriculum is much harder than mandating distribution requirements" (p. 9), it does not seem impossible.

Although Hirsch (1988) addressed the needs of elementary and secondary school students for cultural literacy, his arguments can be applied to the need for common learning at the postsecondary level as well. True literacy requires the ability to grasp the meaning of any piece of writing addressed to the general reader, and it depends on shared knowledge. This shared knowledge tends to have a national character. "A mastery of a national culture is essential to mastery of the standard language in every modern nation" (p. 18). Hirsch argued that cultural tolerance and cultural pluralism are enhanced by our "big-tented and tolerant" civil religion which, "as expressed in our national rites and symbols, is in fact a central source of coherence in American public culture, holding together various and even contradictory elements of its tradition" (p. 99). Our national vocabulary, by which Hirsch meant our cultural literacy--the whole system of widely shared information, is more tolerant of diversity than the civil religion. What counts in the sphere of public discourse is "simply being able to use the language of culture in order to communicate *any* point of view effectively"

(p. 103). Hirsch argued that the idea of literacy includes a larger vocabulary which includes shared scientific and technical knowledge.

> We require not only that ordinary citizens be scientifically literate but that technicians and scientists master the nonscientific literate culture. To explain the implications of their work to others, experts must be aware of the shared associations in our literate vocabulary and be able to build analogies on those associations. (p. 108)

Hirsch (1988) blamed formalism for the decline of American literacy and the fragmentation of the curriculum. Formalism stresses that content does not matter as long as it is tied to what the child already knows. He claimed the school curriculum is fragmented both "horizontally across subjects and vertically within subjects" (p. 116). This fragmentation was blamed on the movement away from traditional humanism with its prescribed curriculum to American pragmatism and European romanticism. Dewey's emphasis on social utility as an educational goal and Rousseau's and Wordsworth's emphasis on the development of the whole child--that the child's positive self-concept is the key to learning--led to abandonment of the prescribed curriculum. Formalism led to the use of different contents for different students to accomplish the same aims. Accommodation of individual differences through tracking and grouping reinforced the fragmentation that was being introduced by vocational schools. Hirsch claimed,

> Any educational movement that avoids coming to terms with the specific contents of literate education or evades the responsibility of conveying them to all citizens is committing a fundamental error. However noble its aims, any movement that deprecates facts as antiquated or irrelevant injures the cause of higher national literacy. (p. 133)

Bloom (1987) advocated the Great Books approach. He dismissed two typical responses to the excess openness of the 1960s: a breadth requirement met through distribution requirements, and the offering of composite courses. The distribution requirements are usually met with existing introductory courses. This approach provides

> a general education, in the sense in which a jack-of-all-trades is a generalist. . . . It just teaches that there is no high-level generalism. . . . Thus they desire to get it over with and get on with what professors do seriously. (pp. 342-343)

The dangers of composite courses "are trendiness, mere popularization and lack of substantive rigor" (p. 343).

> . . . The only serious solution is . . . the good old Great Books approach, in which a liberal education means reading certain generally recognized classic texts, just reading them, letting them dictate what the questions are and the method of approaching them. . . . One thing is certain: wherever the Great Books make up a central part of the curriculum, the students are excited and satisfied, feel they are doing something that is independent and fulfilling, getting something from the university they cannot get elsewhere. . . . Liberal education flourished when it prepared the way for the discussion of a unified view of nature and man's place in it, which the best minds debated on the highest level. It decayed when what lay beyond it were only specialties, the premises of which do not lead to any such vision. (pp. 344-347)

Gow (1989) discussed "The True Purpose of Education" and concluded:

> The rigorous study of and conversation about the great works of the moral and intellectual giants of civilization will remind us that the true aims of education are wisdom and virtue. These qualities are much needed not only in our personal and social lives, but in our professional and economic lives as well. (p. 546)

Kirk (cited in Gow, 1989) asserted:

> From the beginnings of formal education, a primary aim of schooling has been the development of sound character. The end of true education is ethical; that end is to be attained through intellectual means. (p. 545)

Gow argued that the intellectual means are through study in the humanities and the classics.

Hall (1983) claimed the designation of liberal education has changed from one leading to cultural completeness to one involving indiscriminate choice. Consumerism has replaced the primary functions of liberal education. The term *liberal* means "the spectrum of human affairs connecting us to all our values and achievements, without which our perspectives would be distorted and our judgments and communications fragmented" (p. 9).

Hall (1983) was critical of distribution requirements:

> This label is not merely tactless; it is a bureaucratic violation of the language of liberal education. No wonder it raises hackles--it suggests illiberal constraints. It is properly replaceable by core curriculum. A core curriculum by definition is not a set of regulations and requirements regimenting faculties and students. It is a central paradigm of the liberal education in which both are engaged. It does not constrain, it organizes them. The vexation, theoretical and empirical, here as elsewhere can hardly diminish until the entire semantic structure has been improved. (p. 11)

At Harvard, the core curriculum created in 1945 was dissipated by the events of the 1960s.

> Never before had there been such freedom for faculty and students to pursue their particular interests. But in the process, as in Eliot's day, something important had "fallen through the mesh of the academic basket." That something was what critics of the general education movement called its tacitly political concern with preparing students for their lives as responsible human beings and citizens in a democratic society. (Keller, 1982, pp. 32-33)

The Task Force on the Core Curriculum at Harvard reached agreement that "the aims of general education are not compatible with unrestrained choice" (Keller, 1982, p. 51). The group agreed upon eight areas of study and allowed flexibility to meet goals established for each of the areas. Keller said, "The eight requirements added up to a program for fostering skills and conveying basic modes of academic thought, not a program for passing on a received body of information and ideas" (p. 54). A balance between too much structure and too much flexibility was sought by allowing a reasonable number of courses in each of the eight areas.

Nelson (1990) was critical of what he considered to be the content-free character of the core.

> The philosophy behind the core is that educated people are not those who have read books and have learned many facts but rather those who could analyze facts if they should ever encounter any, and who could "approach" books if it were ever necessary to do so. Facts may change or become irrelevant, but analytic faculties will always be useful. (p. 76)

Nelson (1990) characterized the core as a "strange bunch of distribution requirements" or, as one faculty member called it, "old garbage in new pails" (p. 76). Nelson concluded that "students can graduate from Harvard without ever having studied the books that are commonly considered great or the events that are commonly considered most important" (p. 80).

Hansen (1982) summarized what general education should include and described responses of four institutions. The components include advanced learning skills, distribution requirements, and integrated learning experiences.

The advanced learning skills include composition, mathematics, foreign languages, and physical education. For less selective schools, the "advanced" learning skills may translate to basic or remedial skills. The distribution requirement, or breadth component, requires students to take courses in the humanities, social sciences, and natural sciences (typically); sometimes specific courses are required, but more commonly students are allowed to take any course in the area. Fragmentation and lack of direction are often the results.

Integrated learning experiences are frequently used to overcome the fragmentation of a distribution model. Capstone courses, thematic or problem approaches, central subjects, and core courses are examples of the integrated learning experience. Hansen (1982) stated that the interdisciplinary approach and the core course are the two most common approaches. Citing Fulcher, Hansen defined a topic as integrative "if some of its details and their relations are apt to be misperceived or misinterpreted or omitted when viewed by only a single discipline" (p. 252). Because the ability of students to synthesize is often a function of maturity, integrating experiences may have more meaning as upper division offerings.

The core approach emphasizes common learning experiences. Drawing on Arden, Hansen (1982) stated that a successful core curriculum must draw on other components of the curriculum, be allotted sufficient time (25% to 50% of the program), and extend over the entire four years.

Hansen (1982) reviewed four models of reform: Harvard, Bowling Green State University, St. Anselm's, and Los Medanos Community College. The Harvard model emphasizes methods of thought rather than specialized subject areas. The intention is to reduce fragmentation, which is a result of the elective-distribution model.

The Bowling Green model uses an outcomes approach, focusing on ends rather than means. The model culminates in a capstone experience that allows students to approach a problem from the perspective of the "enlightened generalist" and to synthesize general education (p. 256).

A Great Books approach is used at St. Anselm's College. The focus is on historical personalities, "people who exemplify outstanding performance in various forms of human activity [and who] are studied through a multi-disciplinary format" (p. 257). The program has allowed for the interpretation of western civilization and exploration of human values in a systematic way.

At Los Medanos, two goals of general education are predominant: to make respect for cultural pluralism pervasive in the curriculum and to encourage students to develop their own programs for continuing education. The program consists of an interdisciplinary core of courses and the opportunity to explore a problem or idea in depth.

Hansen (1982) concluded that no single ideal program of general education exists. The strength of American education is its diversity. Nevertheless, he saw certain shared characteristics of successful general education programs:

1. A general education program should be a distinct recognizable entity.
2. A general education program should equip students with the skills and interests to ensure lifelong learning.
3. A general education program should acquaint students with the broad domains of knowledge.
4. A general education program should enable students to understand methods of inquiry.
5. A general education program should encourage students to be competent users of information systems, including libraries and computers.
6. A general education program should be distributed throughout the college years, rather than being concentrated at the beginning.
7. A general education program should offer integrative and synthesizing experiences, preferably in the senior year. (p. 261)

Butts (1982) proposed a core curriculum centered on the civic function of preparing citizens for their roles in a political community governed by law rather than kinship, religion, or status. He traced this purpose of education back to the views of the founding fathers. Butts argued that the purposes of the prescribed curriculum of the Experimental College at the University of Wisconsin, founded by Meiklejohn, were primarily civic and moral:

> to prepare students to take their places as free and responsible members of the American Community, to think about important and significant problems required for creating a just and free civilization, and to build a sense of civic community in a segmented society and fragmented world. (p. 383)

Butts cited Boyer and Levine regarding the purposes of the general education movement. The themes point to a common set of values:

> the preservation of democracy, the sharing of citizen responsibility, the commitment to ethical and moral behavior, the enhancement of global perspectives, and the integration of diverse groups into the larger society. . . . The emphasis appeared consistently to be on shared values, shared heritages, shared responsibilities, shared governance, and a shared world vision. (p. 385)

Butts (1982) proposed a set of ten value-oriented claims to use as a framework for a common civic core. A parallel exists between the traditions of individuality and community that Boyer said are at the heart of undergraduate education and the value-concepts Butts provided. One type of concept promotes "desirable, cohesive and unifying elements," and a second type promotes "desirable, pluralistic and individualistic elements in a democratic political community" (p. 391). Butts argued that "there is a continuing tension, and sometimes overt conflict, between the values of *unum* and the values of *pluribus*, but I believe that liberal education must, just as American democracy must, try to balance, honor, and promote both" (p. 391).

Butts (1982) stated that these normative concepts should be confronted directly throughout the undergraduate education and account for one-third to one-half of a student's time. The ten value concepts are as follows:

1. Justice, in a public sense, as used by John Rawls.
2. Freedom, of the person and of private action; and of the mind and of intellectual inquiry.
3. Equality of rights and opportunity.
4. Diversity, but with stability.
5. Authority as legitimate power.
6. Privacy as the right to be left alone and the right to determine what information about oneself is revealed.
7. Due process.
8. Participation, both as an idea and as practice.

9. Personal obligation for the public good as a sense of responsibility symbolized by loyalty, patriotism, discipline, and duty.

10. International human rights which honors diversity but seeks cohesion (pp. 391-398).

Butts (1982) concluded that the curriculum should combine the values of stable pluralism with cosmopolitan civism.

> In a desirably pluralistic society, civic liberal education must honor cultural *pluribus*, but it must also strengthen political *unum*. Somehow, we must redouble our efforts to redesign a *liberal* general education, one that will promote and protect the rights of all persons to hold a diversity of *beliefs*, but also develop a commitment to *actions* that uphold the common bonds of a free government, the surest guarantee of the very holding of a pluralism of beliefs. (pp. 398-399)

Mears (1986) proposed evolutionary process as an organizing principle to overcome the fragmentation of the curriculum and the disintegration of a shared set of beliefs about the goals of undergraduate education. "We must be prepared to demonstrate the interrelationships and linkages between departmentally separated fields" (p. 314). Mears's 12-credit core curriculum would include one course dealing with physics, astronomy, and geology; a second course focusing on chemistry and biology; the third course taught by anthropologists, archaeologists, and historians; and the final course taught by historians and social scientists. Historical process is viewed as a means of establishing connections across fields and over time. Mears argued that specialization does not necessarily add to deep insight:

> We might consider the possibility . . . that an exhaustive investigation of narrow topics is likely to evoke profound understanding only when coupled with background breadth, while specialization will yield shallowness if it divorces particular information from the larger context. Once we accept that idea, we are ready to appreciate the value of a common educational experience for all undergraduates . . . through a number of core courses . . . in the first two years of the bachelor's degree. (pp. 314-315)

Smith (1983) argued that the major dominates the curriculum because of the political power of the department. Neither the major, nor departments, are justified on educational grounds. Smith claimed that the major lacks coherence and that most "are miniaturized distribution requirements, and fall prey to the same criticism of such requirements at a more general level" (p. 14). Smith said,

> Students ought not to be asked to organize and integrate what the faculty will not. Distribution requirements--whether at the level of general education or the middle-range of the major, violate these two injunctions at will. (p. 15)

Ferris State University (1990) has developed a general education proposal that illustrates the outcomes approach. Eight outcomes are specified:

1. Communications competence--reading, writing, speaking, and listening.

2. Lifelong learning and organizational skills, including library and information skills, project organization skills, collaborative skills, and computer competence.

3. Quantitative skills in mathematics and statistics.

4. Reasoning ability, including demonstrated competence in problem solving, critical thinking, independent decision making, ethical decision making, valuing, and civic responsibility.

5. Scientific understanding.

6. Social awareness and the ability to assess issues involving social institutions, interpersonal and group dynamics, social tradition and change, cultural diversity, and human development and behavior.

7. Global consciousness.

8. Cultural enrichment.

The Ferris proposal includes both a core that all students must complete and a restricted distribution of courses allowing some choice by students. The requirements include coursework in the upper division to foster lifelong learning skills and to match the growing maturity of students. Active learning, assessment, academic support, and professional development are other elements of the proposal.

The Draft Report of the Council to Review Undergraduate Education (CRUE) of Michigan State University (1988) included several proposals regarding the general education component of undergraduate education. Spreading general education across four years would help students see the relationship between the major and general education and allow more complex courses to be offered. Integrating experiences are proposed, including vertically arranged core courses in the arts and humanities, the behavioral and social sciences, and the natural sciences. The integrative senior capstone course would draw on general education courses.

Woditsch, Schlesinger, and Giardina (1987) made the case for liberal education over the four-year period. Citing studies supporting the claim that liberal arts graduates are superior to the more technically trained, they argued that it is the approach to the subject matter, not the subject matter itself, in which liberal and specialized instruction differ.

> Given that good thinking occurs only in context, the baccalaureate should demand *throughout* its breadth and depth the exercise of intellectual skill. Curriculum becomes more than a sequence of courses; in this light, it becomes an orchestrated sequence of summonings for the student to think skillfully. (p. 53)

Students need to operate on information, not simply retain it. Thinking skills mature recursively and need to be caught in action to be guided.

Integration and coherence are objectives of the cluster approach to structuring the general education curriculum. Syracuse University requires students to take four-course, topical sequences in the humanities, social sciences, and natural sciences. The core catalog identifies which clusters are thematically related. Albright College allows students to meet the humanities requirement by choosing six general studies courses from at least four departments. An integrating course, which is team taught, is required for each cluster. Students are identified as cluster students, and a notation is made on the transcript when the cluster is completed. To provide additional coherence, cocurricular activities are offered to complement the classes (Brown, 1985).

Johnson County Community College (1989) developed a nonmandated core curriculum as an alternative to distribution requirements. Because of the diverse needs of students, some of whom will transfer to other institutions that require different courses, and because of staffing constraints, the core is not required of all students. The goal of coherence is believed to be more effectively met for students electing the core.

Boyer and Ahlgren (1987) stated that 95% of the nation's colleges and universities impose distribution requirements.

The distinction between the core curriculum and the distribution requirements model should be viewed in terms of a continuum rather than an either-or choice. A distribution model with a restricted number of choices is frequently referred to as a core curriculum (e.g., Harvard). A common core plus additional distribution requirements is not uncommon. Clustering and thematic approaches represent another approach midway on the continuum. The changes that have occurred, and are occurring, are in the direction of greater prescription and less choice, to use Bok's dichotomy.

Other Issues in General Education

The value of general education is another area of concern. Students must be helped to see the relevance of general education and to make connections across disciplines.

Boyer (1987) reported on the ranking of reasons for going to college given by high school seniors and their parents. Students were more career oriented than their parents, who placed greater value on reasons associated with general education. College students' ratings of general education subjects indicated that only a small minority of students thought course requirements should be increased; computer science was the exception. Student support for general education diminished between 1976 and 1984.

Green (1982) discussed the ways of detecting "educational worth" in liberal education. He argued that the question has changed from "how persons can be educated to value (verb) those things that have worth (predicate) . . . [to what are] people's values [and how can we] change them?" (p. 129). Green argued that evaluation can start only after we learn to recognize the education of worth.

Hinni and Eison (1990) reported that parents of college freshmen surveyed at summer orientation programs indicated that skills identified as most needed for the future were correlated with skills taught in general education. Parents are included in a two-day summer orientation program and attend parents' classes in which they learn about the general education program and witness instructional strategies being modeled. The results of the program include the development of a better understanding of the academic program and general education requirements. Parents are able to discuss program specifics with students and provide intellectual and emotional support for freshmen.

The Freshman Seminar Program at The Pennsylvania State University, described by Mark and Romano (1982), provides a detailed introduction to liberal arts disciplines, using a seminar format. The instructors, who also serve as academic advisors, teach small classes, emphasize writing, and attempt to convey the types of activities that are necessary to be active members of the discipline. Program participants volunteered after learning about the program during a summer orientation program. Viewed in terms of affective outcomes, the program was successful. Students were more satisfied with advising, had improved general attitudes toward the institution and toward liberal arts education, and had increased confidence and a sense of excitement about the issues that had arisen in their classes. If outcomes are measured in terms of grade point averages, retention, or ratings by nonseminar instructors, no significant differences were observed.

The Association of American Colleges (1988) report, A New Vitality in General Education, supported a change in practice to combine freshman orientation with introductory courses in general education. The report urged a half-year, if not a full year, of orientation.

A sense of the educational worth of general education may be enhanced through the use of activities designed to help students see the value of general education during orientation or the freshman year. Bok (1986) said,

> Colleges must communicate the goals to students and explain their importance. Members of departments . . . need to come together . . . to make sure the shared purposes are not forgotten amid the private aims and interests of individual professors. (p. 63)

Should general education be placed in the first two years or spread over four? While the official view of "academe is that general education is essential, [the] working position, for many people out in the trenches, is that general education is a nuisance or a waste" (Wee, 1987, p. 454). Wee argued that, instead of getting general education out of the way, specialized education should get out of the way of general education. "General education should be part of every educational program, from the students' first year to their last" (p. 460).

Mears (1986) made an argument for general education in the first two years, before study in the major.

Hindern (1984) believed that the distinction between the first two years of college, reserved for general education, and the second two, for which specialization is appropriate, must be reinforced. Connectedness between disciplines could be improved.

The Memphis State University model, mandated by the Tennessee State Board of Regents, reserved general education for the first two years (Petry, 1987).

An Association of American Colleges (1988) report argued that general education is not preparatory--not something to be gotten out of the way. The report said

> that efforts to confine general education to the first and second year of college are . . . self-defeating. They assume freshmen . . . can undertake syntheses that few . . .

> instructors could achieve; and they make general education appear to be an isolated activity--requirements to be finished, gotten out of the way, and then forgotten--rather than a continuing process of growing throughout the years. (pp. 22-23)

This view is the dominant view.

Advising for general education is another area singled out for reform. Coherence requires adequate advising. Faculty too often are involved in perfunctory scheduling activities instead of advising. Use of upperclass students and group advising can help improve advising (Association of American Colleges, 1988).

Other issues are the improvement of college catalogs and publications to show how courses from different disciplines can be grouped or clustered around themes, differential treatment of commuter and nontraditional students, and use of extracurricular activities to provide coherence and integration of general and professional education (Association of American Colleges, 1988; Bok, 1986; Boyer, 1987).

Most reports and efforts at reform of general education have not stopped with a discussion of the curriculum. Emphasis has been placed on the quality of instruction and the encouragement of active learning (Association of American Colleges, 1988; Bok, 1986; Gaff, 1983; Woditsch et al., 1987). Evaluation of faculty performance (Association of American Colleges, 1985) and a new definition of scholarship to encourage good teaching and research in teaching (Boyer, 1990) have also been discussed in the context of general education.

Reform of General Education

Campbell and Flynn (1990) outlined four planning principles for curricular reform. Sufficient flexibility in the plans is needed to modify goals and alter procedures. Risk taking must be balanced against scrupulous attention to procedure. Extensive involvement and participation by the faculty in the process will build enthusiasm for the program and help develop consensus. True collaboration and effective communication between the faculty and administrators are needed. The presence of these elements led to the successful reintroduction of a core curriculum at their institution.

Keller (1982) cited two elements that contributed to curricular reform at Harvard: conservative financial management and the commitment to faculty governance. The financially inspired stress on priorities stimulated curricular reform. Dean Rosovsky saw his role at Harvard as engaging as many faculty as possible in the process of identifying goals. The only workable solution would be one that emerged from the faculty.

The first task at Harvard was to convince the faculty that there was a problem with the status quo (Keller, 1982). After the faculty reached agreement in principle on the core curriculum, departmental turfism surfaced, what Rosovsky described as the "where is mine phase" (p. 138). The student press took a negative, adversarial position with respect to the core. These anxieties had to be dealt with. Consensus building took four years.

Gaff (1983) also emphasized dialogue--within and across disciplines. The committee or task force reviewing general education must reach agreement on five issues: (a) understanding of the mission of the college, (b) definition of an educated person, (c) assessment of the adequacy of the current program, (d) determination of how to help faculty members make informed decisions, and (e) the philosophical basis of the curriculum.

Gaff (1983) outlined three misconceptions of which curriculum committees should be wary. First, a committee should not try to transplant a program that has been successful elsewhere. The program should reflect the institution's strengths and interests. Second, a comprehensive reform does not have to be introduced all at once. Third, the committee should not view its task as merely restating distribution requirements.

Gaff (1983) outlined procedural errors to avoid, emphasized the importance of understanding what is meant by general education and that there is more than one meaning, and provided valuable advice about securing faculty approval. Voting procedures need to be given attention.

O'Banion and Shaw (1982) reviewed various obstacles to general education. Among the methods they suggested for overcoming obstacles was to conceive general education as a core of outcomes rather than as a core of courses. Turfism will be less of an obstacle if outcomes can be achieved in a variety of ways.

Grandstaff maintained that any reform in higher education will be evaluated in terms of its effect on the collegiate ideal (Raines, Grandstaff, & Hekhuis, 1989). The elements of the collegiate ideal include centrality of teaching, autonomy of the institution and the faculty, the belief that learning is a good thing in itself, merit, and the importance of the faculty. Reform efforts that enhance the collegiate ideal will be given support. General education reforms are near and dear to the academic heart.

The curriculum debate is healthy.

> The fact that curricular debates are inconclusive does not mean that they are unimportant. Far from it. Any college runs a serious risk if it does not undertake a full blown review of undergraduate education every fifteen or twenty years. . . . A faculty that has made a considered choice of some common philosophy is vastly better off than one that struggles along with no philosophy at all. (Bok, 1986)

Evaluation Models

Kemmis and Stake (1988) provided descriptions of several different types of evaluations. Relevant models for this study include the following. Evaluation for improvement, as contrasted with measurement of outcomes, focuses on the "why" and "how" instead of the "what." Formative evaluation differs from summative evaluation in purpose; it aims at improvement by providing information to help curriculum developers modify curricula. The distinction blurs when summarizing achievement as part of the curriculum-development purpose. Action research is self-evaluation by teachers or other school personnel to improve practice or to improve understanding of practice. Issues-centered evaluation focuses on the differences between the intended and unintended (antecedents, transactions, and outcomes) in curriculum and the differences between how a curriculum works in practice and the judgments people make about it. Responsive evaluation orients more toward program activities than to program intentions. Issues may be used to structure an evaluation and make it responsive. Issues are circumstances about which people disagree. Other characteristics of issues are causal implication, concern, and contextual complexity.

Stake's Countenance Model (Kemmis & Stake, 1988) asks for data for antecedents, transactions, and outcomes. A distinction is made between intentions and observations in the description matrix. Antecedents are conditions existing before instruction that may affect outcomes. Transactions are the process of instruction. Outcomes are the effects of the program. This model is a responsive model, aimed at explaining the "why" of the outcomes. The model is issue oriented and intended to provide information to curriculum developers.

Transcript Studies and Surveys

Assessment of the implementation of distribution requirements has been minimal. In a study of the patterns of undergraduates' credit distributions, Boyer and Ahlgren (1987) found significant differences among majors in different disciplines in terms of the number of credits taken outside the distributional area of the major, and in the degree of specialization of these "extra-major" courses. If liberal education is defined in terms of breadth of credit distribution and the number of credits earned in distributional areas outside the area of the major, then distribution requirements may have achieved only limited success in ensuring breadth. The researchers did not argue for more prescription. They concluded that, when tinkering with general education requirements, not only should philosophy be debated, but the ways in which undergraduates respond to changed requirements should be considered.

The Florida State Postsecondary Education Planning Commission (1989) conducted a study of community colleges and universities to determine compliance with the Gordon rule, which required credits in English or humanities and mathematics before the awarding of an associate degree or upper division status. The study included 1,260 transcript audits. Whereas community colleges were found in compliance, universities were not. Significantly higher scores were achieved by students meeting the Gordon rule before taking the College-Level Academic Skills Test. No attempt was made in the study to determine the reasons students chose certain courses to meet requirements or the effect of personal preferences or scheduling problems. University students earned significantly greater numbers of credits in humanities and social sciences than did community college students. The latter earned significantly greater numbers of credits in English, mathematics, and the "other" category. Significant differences among majors were found regarding compliance with the Gordon rule.

Suskie (1983) audited student transcripts to record choices made to meet distribution requirements, with particular emphasis on the year when requirements were met. Most requirements were met during the freshman or sophomore year, except only one-third had met the humanities requirement by the junior year. Differences among majors were found. Course selection was concentrated. More than 40% of the students met social science requirements with psychology courses, and more than half of the students met humanities requirements with U.S. history courses. Suskie did not examine the reasons students made their selections.

Morris, Leone, and Mannchen (1987) reported on students' compliance with a new core requirement at Miami-Dade Community College. The study involved 377 transcript audits. The findings were that the vast majority of students (99%) had met the core requirements and that most students completed the core courses before taking courses to meet distributional requirements.

Sworder (1986) studied class-time preferences of students by distributing questionnaires at registration. The findings indicated a willingness of both male and female students to take more afternoon classes in three-hour blocks. Students have restricted choices if colleges do not offer courses during this time. Lack of information regarding students' preferences may lead to inadequate course offerings.

Summary

The literature described tensions between individuality and community, between choice and prescription in the curriculum, between the needs of the student and the needs of society, and between increased specialization and fragmentation of the curriculum resulting from the demands of professional and occupational education and the increased need for general education in an increasingly complex and changing world.

The reform of general education must provide for reconciliation of these competing demands. Issues of integration and coherence of the curriculum must be addressed. Curriculum evaluation and change efforts need to include broad involvement and participation by the faculty. Reform efforts should include an examination of the bases of student choices and the likely response of students to changes in requirements. Student evaluation of the benefits of general education strongly suggests the need to help students make the connections between general and specialized education.

CHAPTER III

RESEARCH PROCEDURE

Data were collected from transcript audits of 145 students graduating in baccalaureate programs at Lake Superior State University (LSSU) during the period from fall quarter 1990 through summer quarter 1991. These 145 students represented a random sample equal to 27% of the population stratified on the basis of degree groups. A subset of this sample of students, equal to 20% of the population and stratified by degree group, was randomly selected for interviews. The collected data were analyzed using analysis of variance as a statistical procedure. Alpha error levels were set at .05.

Data Sources

Data were collected from student records and interviews with students. Student audit sheets, which are submitted to the LSSU Registrar when students declare they are candidates for a degree, were the primary source of information concerning the courses students chose to meet their general education requirements in the humanities, social sciences, and natural sciences. Transfer credit evaluations were the source of information when degree audits indicated transfer credit was used to meet requirements. Transcripts from institutions from which courses were transferred served as a supplementary source when transfer credit evaluations failed to fully disclose course information or provided ambiguous information. Transcripts from LSSU served as a supplementary source when audit sheets did not provide complete information. Transcripts were used to obtain information regarding the number of credit hours students had earned when they completed requirements in each of the disciplinary fields. The total number of quarter credits earned in each of the three areas was obtained from transcripts and the supplementary sources outlined above.

Student interviews were conducted to obtain information about the individuals, publications, or factors affecting choice of courses to meet requirements. Interviews provided information about students' perceptions of the contributions of general education to their general development and to understanding of their majors. Students' opinions of whether credit hour requirements should be increased or decreased were collected.

Population and Sampling

The population for this study consisted of all students declaring candidacy for a baccalaureate degree from LSSU during fall 1990, winter 1991, spring 1991, and summer 1991 quarters. The sample used for document audits was equal to 27% of the population and was proportionally stratified by degree group. The population included students who had filed Declaration of Candidacy forms with the Registrar's Office by April 25, 1991. Some students in this population did not meet all of the requirements for their degrees by the end of summer quarter; some students, who did not file declarations by the April 25 deadline, still may have met the degree requirements during this period.

Table 2 shows the population size, the sample size for interviews, and the sample size for document audits. The samples were drawn randomly and stratified on the basis of the five degree groups listed in Table 2 and explained in detail below.

Table 2.--Population and sample size.

Degree Group	Population n	Interview Sample n	Document Audit Sample n
Life Sciences	93	19	26
Social Sciences	113	23	31
Business	143	29	39
Math/Technology	96	19	28
Criminal Justice	73	15	24
Total	518	105	148

Five groups of degrees were created for purposes of this study. Shortened titles, listed in parentheses, are used in tables and figures in this study.

Group A: Biological and Health Sciences (Life Sciences)

Bachelor of Arts in Biology
Bachelor of Science in Biological Science
Bachelor of Science in Environmental Science
Bachelor of Science in Fisheries and Wildlife
Bachelor of Science in Medical Technology
Bachelor of Science in Nursing
Bachelor of Science in Therapeutic Recreation
Bachelor of Science in Exercise Science

Group B: Arts and Social Sciences (Social Sciences)

Bachelor of Arts in English Language and Literature
Bachelor of Arts in History
Bachelor of Arts in Political Science
Bachelor of Arts in Psychology
Bachelor of Arts in Social Science
Bachelor of Arts in Sociology
Bachelor of Science in History
Bachelor of Science in Political Science
Bachelor of Science in Psychology
Bachelor of Science in Social Science
Bachelor of Science in Sociology
Bachelor of Science in Human Services
Bachelor of Science in Legal Assistant Studies

Group C: Business, Accounting, Finance and Management (Business)

Bachelor of Science in Accounting
Bachelor of Science in Business Administration
Bachelor of Science in Finance and Economics
Bachelor of Science in Recreation Management

Group D: Mathematics and Engineering Technology (Math/Technology)

Bachelor of Science in Automated Systems Engineering Technology
Bachelor of Science in Electrical Engineering Technology
Bachelor of Science in Mechanical Engineering Technology
Bachelor of Science in Computer and Mathematical Technology
Bachelor of Science in Geology
Bachelor of Science in Mathematics

Group E: Criminal Justice (Criminal Justice)

Bachelor of Science in Criminal Justice
Bachelor of Science in Criminal Justice and Conservation Law
Bachelor of Science in Fire Science

The degree groupings were organized along current departmental lines with some exceptions to allow for larger sample sizes.

Group A included degree candidates from three departments. Nursing students, from the Department of Health Sciences, and

Exercise Science and Therapeutic Recreation students, from the Department of Social Sciences, were combined with all majors from the Department of Biology and Chemistry. The number of graduates in Nursing was small (34), and many of their service courses were taken from Biology and Chemistry. Furthermore, at one time the organizational structure included nursing and biology in one division. The Exercise Science and Therapeutic Recreation students share professional concerns with Nursing students. Social Sciences only recently was merged with another department to include these two degree programs. The population of Group A comprised 93 persons. Sample size for the interviews was 19 students, 20% of the population. Sample size for the document audits was 26 students, 28% of the population.

Group B included graduates of Arts and Letters (English Language and Literature and History) and what may be considered the traditional social sciences (Sociology, Psychology, Political Science, and Social Science). The group included most other majors of the Department of Social Sciences (Human Services and Legal Assistant Studies). Excluded were Recreation Management (Group C) and Criminal Justice, Fire Science, and Conservation Law (Group E). History majors were included in Social Sciences until recently, and their numbers are small (8). English Language and Literature majors numbered seven and were included with Group B in the belief that they were most closely aligned with this group in terms of their interests. The population of Group B comprised 113 individuals.

Sample size for interviews was 23 students, 20% of the population. The sample for document audits included 31 students, 27% of the population.

Group C included all baccalaureate graduates of the Department of Business and Economics (Accounting, Business Administration, Finance, and Economics) as well as Recreation Management from Social Sciences. The latter degree includes a built-in business minor. Students regularly change majors between these two programs. The population included 143 students. Sample size for interviews was 20% of the population, 29 students. Sample size for the document audits was 39 students, 27% of the population.

Group D combined the graduates of two departments: Engineering Technology and Mathematical, Computer and Geological Sciences. The latter department had only 19 graduates. Engineering Technology students earned a large number of credits (mathematics and physics) from the other department, and majors of both departments shared a common interest in computers. The population of this group was 96. Sample size for interviews was 19 students, 20% of the population. Sample size for document audits was 28 students, 29% of the population.

Group E consisted of majors in Criminal Justice, Conservation Law, and Fire Science. All are part of Social Sciences, taught by the same faculty in the same classroom building. Population size was 73. Sample size was 15 students for interviews, 20% of the population. The sample for document audits comprised 24 students, 33% of the population.

Samples were drawn from a list of names provided by the Registrar's Office. The list was organized alphabetically by degree designation, with B.A. degrees listed first followed by B.S. degrees. Students' names were numbered, by degree grouping, in the order they appeared on the list. Using a random number table, names were drawn (as numbered) as proportionally stratified (by degree grouping) samples of the total population. Students receiving more than one baccalaureate degree were included only once in the population. Department heads or faculty members were consulted in instances in which students received more than one degree to determine the major emphasis of the student in order to place the student in a single degree grouping.

A proportionally stratified sample equal to 27% of the population was drawn. Additional names were drawn as replacements for students who refused to participate or could not be contacted. A smaller sample comprising 20% of the population was used from which to collect interview data. The sample of students interviewed was chosen from students whose names appeared first on the list from the larger sample. The sample of students interviewed was a subset of the sample of students whose documents were audited for all five degree groups. For Groups A (Life Sciences) and E (Criminal Justice), replacement names had to be used because of student refusals to requests for interviews or because students could not be contacted. (Some students had graduated at an earlier date and current telephone numbers were not available.) For these two groups, then, the population used for document audits was increased above 27% of the population: 29% for Group A and 33% for Group E. The trade-off in this decision was between maintaining a truly stratified sample, by degree groups, for document audits (but with different subjects in the two samples), and maintaining the interview subjects as a subset of the larger sample for document audits. The researcher chose the latter option. The sample used for document audits increased to 28% (146 individuals) of the population as a result of this decision.

The number and percentage of students in each group who refused an interview or who could not be contacted are shown in Table 3. The percentages are expressed as fractions of the numbers of students in each group whom interviewers attempted to contact.

Table 3.--Noncompleters for interviews.

Group	Interview Sample							
	Number Asked		Refused to Interview		Unable to Contact		Number Completed	
	n	%	n	%	n	%	n	%
Life Sciences	26	100	1	4	6	23	19	73
Social Sciences	29	100	2	7	4	14	23	79
Business	34	100	1	3	4	12	29	85
Math/Technology	26	100	3	12	4	15	19	73
Criminal Justice	24	100	1	4	8	33	15	63
Total[a]	139	100	8	6	26	19	105	75

[a]Percentages may not add to 100 due to rounding.

Demographic information about the student sample is provided in Appendix I.

Interview Guides

Interview guides were constructed (see Appendix B) to obtain the following information:

1. Country of completion of secondary education (U.S. or non-U.S.).

2. Age at graduation (25 or older, or under 25).

3. Receipt of transfer credit in general education from another institution.

4. Whether general education requirements met through MACRAO Agreement.

5. Class status upon completion of requirements in humanities, social science, and natural science (freshman, sophomore, junior, or senior).

6. Degree of reliance on advice of faculty advisor or other faculty or staff person in selecting courses to meet requirements.

7. Degree of reliance on advice of other students or former students in selecting courses to meet requirements.

8. Degree of reliance on printed information such as catalogs, curriculum guides, admission brochures, and course outlines in selecting courses to meet requirements.

9. Degree of reliance on the reputation of the course instructor in selecting courses to meet requirements.

10. Degree of importance of subject or course content in selecting courses to meet requirements.

11. Degree of importance of students' personal preferences or other commitments with respect to the day of the week or time of the day the course is scheduled in making course selections.

12. Degree of importance of scheduling problems such as filled sections or limited offerings in making course selections.

13. Benefit of courses to general development.

14. Benefit of courses to understanding of major.

15. Student opinion of whether credit requirements should be increased, decreased, or remain unchanged.

An interview guide was developed to seek information on Items 5 through 15 above for the humanities, social science, and natural science requirements independently by asking each of the related questions in three separate series. To lessen the effect that an answer for one discipline might have had on a respondent's answers to questions for the other two disciplines, the entire series of questions was asked for one discipline before moving to the next discipline. The order of the disciplines was altered for different respondents to eliminate any systematic bias. The process was tedious for interviewers and for respondents; however, the researcher believed that the net result would be a reduction in the influence of the response to questions concerning choices in the first discipline upon responses to questions concerning choices in the second and third disciplines that might result if a single question was asked seeking three separate responses. An increase in sample size to ask three sets of respondents, one for each disciplinary area, three sets of questions was deemed impractical and costly.

Respondents were asked to give a response on a five-point Likert scale for Items 5 through 15. Interviewers read the meaning of the extremes of the scale; at the same time, respondents were provided with a printed version of the scales with polar values identified. Some respondents who had left the local area were interviewed by telephone. They were asked to visualize a continuum with polar values identified and to give a response with a numerical value from 1 to 5.

Interview guides were coded with an identification number, major code, and gender code before the interview. The codes identified the specific degree program and department of respondents.

Information sought in Items 3 through 5 above was verified through an audit of student records. The questions were asked in the interviews to stimulate the memory of respondents for the questions that followed about the influences on their choices of courses. The interview guide is included as Appendix B.

Student Records

A sample of student records was audited to obtain the following information:

1. Credits in disciplines used to meet requirements in the humanities, social sciences, and natural sciences.

2. Number of credits taken in the humanities, social sciences, and natural sciences.

3. Number of credits earned when requirements were met in the humanities, social sciences, and natural sciences.

4. Number of transfer credits in the humanities, social sciences, and natural sciences used to meet requirements.

5. Transfer status of students as MACRAO transfer students, non-MACRAO transfer students, and nontransfer students.

The Audit of Student Records is included as Appendix C.

Audit Procedures

Courses and credits were identified as "selected" by students to meet distributional requirements in the humanities, social sciences, and natural sciences using the following criteria in order:

1. Courses listed on the degree audit sheet and identified as meeting general education requirements were used first. In some instances, departments specified courses to be used to meet general education requirements. In other instances, courses were not identified by course number on the printed form, but space was provided to list the course. The course may have been listed by the student, faculty advisor, department head, or Registrar. Only the first 12 credits were counted in the audit. If courses listed totaled more than 12 credits, only a portion of the credits of the last course listed was counted.

2. For some degrees, credits in the major were used to meet distributional requirements as well as major requirements. The audit form did not always list courses under these circumstances. Then the first 12 credits listed on the transcript, or transfer credit evaluation, if appropriate, were counted as meeting the distributional requirement. Transcripts list courses alphabetically, so a systematic bias exists. Transfer credit evaluation listings depend on the order in which courses were taken at the institution from which the credits were transferred and when the transfer credit evaluation was performed, i.e., the evaluation is updated when additional courses are transferred.

3. When audit sheets listed transfer credit as being used to meet distributional requirements, without identifying the specific course, the transfer credit evaluation was consulted to identify courses and credits. The order in which courses were listed on the evaluation determined the selection.

4. When students were completing requirements for a second baccalaureate degree and the first had been earned at another institution, the transfer credit evaluation simply noted that all general education requirements were met without specifying courses for which credit was received. Under these circumstances, the transcript from the institution from which the first degree was earned was consulted. Courses and credits were identified as selected in the order in which they appeared on that transcript.

Credits were assigned to disciplines, or to survey sequences in the three distributional areas, for up to a maximum of 12 credits, using the rules set out above. Fractional credits were used for transfer of semester credits. The criteria used by LSSU identified disciplines in the distributional areas. When transfer credits were used to meet distributional requirements, the criteria used by the Registrar's Office were used. Literature and western civilization could be used to meet requirements in humanities if the student had an associate degree from a Michigan community college. Mathematics could be used to meet natural science requirements by a student transferring credit with MACRAO certification and an Associate of Arts or Science degree. These same courses could not be used to meet these requirements if earned at LSSU.

The total number of credits earned in each of the three distributional areas included both credits earned at LSSU and credits transferred. The definition of the disciplines included in each distributional area was as listed above. If the credit was earned at LSSU, LSSU's classification was used. If the credit was transferred and used to meet a distributional requirement, the transferring institution's classification was used. Mathematics was classified as natural science only if the student was able to use transfer credit for mathematics to meet the natural science requirement.

The number of credits earned when the distributional requirement was met in a particular area was the total number of credits earned, including transfer credits, at the end of the term when the last course used to meet the distributional requirement was completed. Credit for physical education given for completion of military service was not included in the total. Credit by examination, e.g., CLEP or AP examinations, was not counted in the total unless the credit was applied toward the requirement. Credits that did not apply toward the total credits required for the degree, i.e., credits for courses numbered below 100, were not included in the total credits completed when the requirements were met. For students planning to graduate at the end of summer term 1991 who did not meet all of the requirements at the time of the document audit (spring 1991), the total number of credits earned when the distributional requirement was met was estimated as the total at the end of spring term plus the number of credits listed to be completed summer term on the preliminary verification of degree audit form provided by the Registrar. When a distributional requirement was met completely with transfer credit, the number of credits earned was calculated as the total credits, including credits from LSSU, at the end of the term when the credits were officially transferred.

Transfer status of students was obtained from transfer credit evaluations. Students transferring with an Associate in Arts or Science and with MACRAO certification receive transfer credit evaluations with the notation "all general education requirements met." Included with non-MACRAO transfer students were students receiving credit by examination if that credit was used toward one of the distributional requirements in general education.

Interviewers

Students from a senior-level marketing research class were trained and used to conduct the interviews. The interviewers were trained by the researcher with the assistance of faculty members from the Social Science Department's Center for Social Research. Students conducted two focus group sessions with classes of students to gain insight about the interview questions and students' understanding of general education requirements and concerns. Interviewers and focus groups were videotaped as part of the interview training.

Interviewers, as part of their assignment in marketing research, participated in the development of questions for the interview guide. They developed a proposal for analysis of their findings as part of this class assignment. The involvement was not only personally beneficial to students, but it also made them more effective and reliable interviewers.

Interviewers were provided with a sample script to use in making telephone calls (see Appendix B). An explanation of the MACRAO Agreement was included in the interview guide, which could be read to the respondent.

Elaboration to questions using the Likert scale response was sought where the response was 3 or higher (except for the last question, seeking opinion about changes in credit requirements). The purposes for seeking elaboration were to obtain qualitative information and to stimulate respondents' recall.

Respondents were offered a chance in a $50 lottery as an inducement to participate. The refusal rate was 8% among those who were contacted and asked to interview.

Analysis of the Data

Data gathered from the document audits and personal interviews were entered into a computer using the Statistical Package for the Social Sciences for a Personal Computer (SPSS/PC+) for analysis. Descriptive statistics and graphical presentations were generated from Research Questions 1 through 11, as stated in Chapter I. Analysis of variance (ANOVA) was used to test for statistical differences between groups of students based on classifications relating to disciplinary major, gender, transfer status, age, and country in which secondary education was received for the number of credits earned in the distributional areas and the number of credits earned when the requirements were met. Mean response values were calculated for Research Questions 12 through 18 regarding the influence of persons, publications, schedules, and other factors in selecting courses to meet distributional requirements. Using SPSS/PC+, differences in the factors influencing choice of courses were analyzed for different groups of students. ANOVA, with an alpha level of .05, was used to test differences in mean response values for different student groups. The responses from student interviews were not interval data, and ANOVA is not appropriate under such circumstances. Questions were combined, and summated scales were obtained. Each scale was then subjected to ANOVA.

Exploratory Data Analysis

The individual items were subjected to ANOVA for purposes of exploratory data analysis. Hartwig and Dearing (1979) described exploratory data analysis as a state of mind as well as a way of doing data analysis. Skepticism and openness are both needed. Statistical analysis takes on a confirmatory mode. Exploratory data analysis opens up a wide range of possible explanations. The researcher's purpose in this study was to explore possible relationships for the purpose of informing curriculum development. Under such circumstances, the use of ANOVA for individual items using Likert-type responses would seem appropriate.

Mean response values of different groups of students were calculated for Research Questions 19 through 28, dealing with the perceived benefits of general education to general development and understanding of majors, and with opinions as to whether required credits in the distributional areas should be increased, decreased, or remain the same. Differences in mean values of responses for different groups were analyzed using the summated scales and ANOVA in testing Hypothesis 1 through 5. Findings are reported in the following chapter.

Rival Hypotheses

When degree programs require courses that may also be used to meet general education requirements, administrative efficiency may dictate listing those courses as general education courses on the degree audit form. The methodology used in this study identified such courses as student "selections." Students may have identified their selections differently.

One alternative method would have been to identify the first 12 credits in a distributional area listed on the transcript as the courses selected to meet that distributional requirement. However, the student may have viewed those 12 credits as free electives or as requirements in major or minor degree programs. The courses identified in the general education section of the audit sheet were designated by the degree program. Students did not have choices to take or not take the designated courses. The first 12 credits listed on the transcript, if not otherwise required in the program, would not have had to be earned for the degree and in that sense may be viewed as electives rather than general education selections.

A second alternative method would have been to ask the student which courses had been selected to meet distributional requirements. The researcher's experience in advising students led him to believe that this was impractical. Most students would not be able to recall specific courses selected to meet a distributional requirement after a lapse of time up to four years or more.

A clearer picture of program breadth is provided by examining the total number of credits earned in each of the three distributional areas. Individuals intent on reforming general education may find the answers to that question more illuminating.

The lapse of time between the student's completion of distributional requirements and the date of the interview was, in many cases, several years. Students' recall of the factors influencing their selections was incomplete. Students' knowledge of the options available to them was limited. Questions were included to stimulate recall in an attempt to minimize this problem. Students were asked when they completed requirements and whether they had transfer credits in a discipline; they were asked to elaborate on responses greater than 3 on the Likert scale.

Responses to questions about individuals or factors that may have influenced choices in one distributional area may have influenced responses to the same set of questions in another distributional area. To minimize any systematic bias, the order of the disciplines for which questions were asked was changed from one respondent to the next.

Interviewers were trained and provided an opportunity to practice interviews. Focus groups were used as pilot projects to familiarize interviewers with the types of questions respondents may have and the options that were available to students in course selection. Interviewers coded the interview guides. The researcher reviewed each interview guide. These procedures were adopted to minimize error arising in the interview and coding process.

CHAPTER IV

ANALYSIS OF FINDINGS

The findings from the student interviews and transcript audits are presented in this chapter. Data were analyzed with the use of the Statistical Package for the Social Sciences for PC (SPSS/PC+) software, Version 3.1. Analysis of variance (ANOVA) tests were used to test for statistical differences between student groups. Alpha levels were set at .05 unless otherwise noted. ANOVA tables are presented in Appendix F.

Courses Selected

One purpose of the researcher was to determine the choices students made in selecting courses to meet the distributional requirements in the humanities, social sciences, and natural sciences. Research Question 1 was expressed as follows:

> Research Question 1: What was the mean number of credits earned in each of the academic disciplines, or in survey sequence courses, to meet the LSSU requirements in the humanities, social sciences, and natural sciences?

Data were obtained from transcript audits to provide information for Research Question 1. Credits were obtained from the general education section of the degree audit sheet. When courses were not specified on the degree audit sheet to meet a distributional requirement, the transcript was consulted. Under these circumstances, the first 12 credits listed on the LSSU transcript in a distributional area were used. When transfer credit was used to meet a distributional requirement, and when the courses were not specified on the degree audit sheet, the first 12 credits in the distributional area listed on the LSSU transfer credit evaluation were used. If students had obtained a baccalaureate degree at another institution before the current degree, the transfer credit evaluation would not list specific courses. In the two instances in this sample when this occurred, the transcript from the institution where the first baccalaureate was earned was consulted and the first 12 credits listed in the distributional area were used.

Humanities

The single humanities survey course sequence offered at LSSU accounted for a mean of 9.9 credits of the 12 credits required in this distributional area. The remaining credits were widely distributed among disciplines. Table 4 shows the number of credits earned in the humanities sequence and the number of credits earned in all other courses by disciplinary major grouping.

Table 5 shows the data for course selection in the humanities based on transfer status. Students who met part or all of the humanities requirement at LSSU earned 10.5 credits out of 12 with courses from the humanities sequence. By contrast, students who met all of the humanities requirement with transfer credit earned an average of 10.2 credits in disciplinary courses identified as something other than a humanities sequence course. This result is not surprising, given the rules under which general education requirements at LSSU are met.

Table 4.--Humanities credit distribution by disciplinary major group.

Major Area	Humanities Sequence		Humanities--Other	
	Mean	Valid N	Mean	Valid N
Life Sciences	10.5	26	1.5	26
Social Sciences	9.4	31	2.6	31
Business	9.4	39	2.6	39
Math/Technology	9.9	26	2.1	26
Criminal Justice	10.9	24	1.1	24
All areas	9.9	146	2.1	146

Table 5.--Humanities credit distribution by transfer status of student.

Transfer Status	Humanities Sequence		Humanities--Other	
	Mean	Valid N	Mean	Valid N
Some LSSU humanities	10.5	136	1.5	136
All humanities transferred	1.8	10	10.2	10
All	9.9	146	2.1	146

Transfer students with associate degrees from Michigan community colleges are allowed to use credits in such courses as literature and western civilization to meet the humanities requirement if the community college classifies the courses as humanities. If the transfer student lacks the associate degree or is transferring from an institution other than a Michigan community college, such courses as literature and western civilization cannot be used to meet the humanities requirement. Under those circumstances, the student would meet the requirement, at least partially, with credits earned at LSSU. The student is then more likely to use a humanities sequence course to meet the requirement.

Selection of courses to meet the humanities distribution requirement, reported by age of student, is illustrated in Table 6. Students age 25 or older at the time of graduation earned 9.2 credits of the 12 required credits in a humanities sequence. Those students under the age of 25 at the time of graduation earned 10.3 credits, out of 12, in sequence courses.

Table 6.--Humanities credit distribution by age of student.

Age	Humanities Sequence		Humanities--Other	
	Mean	Valid N	Mean	Valid N
25+	9.2	50	2.8	50
25-	10.3	96	1.7	96
All	9.9	146	2.1	146

Students who received their high school education in the United States met their humanities requirement with an average of 9.7 credits in the humanities sequence courses and 2.3 credits in disciplinary courses in the humanities area. Students who received their secondary education outside the United States (primarily Canada) met the humanities requirement with 10.6 credits, out of 12, in the humanities sequence courses (see Table 7).

Table 7.--Humanities credit distribution by country of secondary education.

Secondary Education	Humanities Sequence		Humanities--Other	
	Mean	Valid N	Mean	Valid N
United States	9.7	103	2.3	103
Non-United States	10.6	43	1.4	43
All	9.9	146	2.1	146

The distribution of credits between the humanities sequence courses and disciplinary courses based on gender of students is shown in Table 8. Males earned a mean of 9.8 credits, and female students earned a mean of 10.2 credits, of the 12 credits required in the humanities area.

Table 8.--Humanities credit distribution by gender of student.

Gender	Humanities Sequence		Humanities--Other	
	Mean	Valid N	Mean	Valid N
Male	9.8	83	2.2	83
Female	10.2	63	1.8	63
All	9.9	146	2.1	146

Social Sciences

Social science distribution requirements were met with a broad selection of courses. Unlike the course offerings in the humanities, a sequence of survey courses in the social sciences is not available at LSSU.

Degrees granted by the departments of social science, and business and economics, which offer courses that may be used to meet social science distribution requirements, either specify courses to be used to meet the social science requirement, or the audit sheet does not include a section listing social science requirements. Instead, courses in the major are "double-counted" and used to meet the distribution requirement in social science. The differences in disciplines used by students in different degree groupings can be explained by these factors. Table 9 shows the credit hour distribution among disciplines, by disciplinary major group, to meet the social science distribution requirement.

Table 9.--Social science credit distribution by disciplinary major group.

Major Area	Economics		History		Psychology		Sociology		Pol. Sci.		Other	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences		26	.1	26	5.9	26	5.0	26	.8	26	.2	26
Social Sciences	.4	31	2.0	31	4.4	31	2.6	31	2.4	31	.3	31
Business	9.1	39	.7	39	1.0	39	.7	39	.3	39	.2	39
Math/Technology	1.5	26	3.2	26	1.5	26	2.5	26	2.0	26	1.3	26
Criminal Justice	.5	24	.4	24	3.0	24	4.1	24	3.0	24	1.0	24
All	2.9	146	1.3	146	3.0	146	2.7	146	1.6	146	.5	146

Table 10 provides information for students who met the entire 12-credit requirement in social science with transfer credit compared to the distribution of credits for students who met part of the requirement with courses taken at LSSU. Differences among some disciplines (e.g., political science) may be accounted for by the fact that community colleges from which students transfer may require courses in that discipline irrespective of the degree program.

The distribution of credits among social science disciplines for traditional students (those under age 25 at graduation) and nontraditional students (those 25 years of age or older at graduation) is compared in Table 11. Table 12 contains information about students who received their secondary education in the United States compared to those who received their secondary education outside the United States. Differences in credit hour distributions among social science disciplines might be explained by the disciplines for which transfer credit is likely to be earned by students receiving grade 13 transfer credit or by those who transfer from the more vocationally oriented Colleges of Applied Arts and Technology in Ontario. Differences in distribution of credits in social science based on differences between men and women are presented in Table 13. Female students are disproportionally represented in the nursing program, which may partially account for the greater number of credits in the fields of psychology and sociology for women. The difference may be related to gender bias

Table 10.--Social science credit distribution by transfer status of student.

Transfer Status	Economics		History		Psychology		Sociology		Pol. Sci.		Other	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
At least some LSSU SS	3.2	115	1.2	115	3.1	115	2.8	115	1.5	115	.2	115
12 or more SS transferred	1.6	31	1.5	31	2.7	31	2.4	31	2.1	31	1.7	31
All	2.9	146	1.3	146	3.0	146	2.7	146	1.6	146	.5	146

Table 11.--Social science credit distribution by age of student.

Age	Economics		History		Psychology		Sociology		Pol. Sci.		Other	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
25+	1.6	50	1.7	50	3.4	50	3.0	50	1.6	50	.7	50
25-	3.5	96	1.1	96	2.8	96	2.6	96	1.6	96	.5	96
All	2.9	146	1.3	146	3.0	146	2.7	146	1.6	146	.5	146

Table 12.--Social science credit distribution by country of secondary education.

Secondary Education	Economics		History		Psychology		Sociology		Pol. Sci.		Other	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
United States	2.5	103	1.7	103	2.9	103	2.5	103	2.0	103	.5	103
Non-United States	3.8	43	.3	43	3.3	43	3.3	43	.7	43	.6	43
All	2.9	146	1.3	146	3.0	146	2.7	146	1.6	146	.5	146

Table 13.--Social science credit distribution by gender of student.

Gender	Economics		History		Psychology		Sociology		Pol. Sci.		Other	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Male	2.8	83	2.0	83	2.1	83	2.4	83	2.0	83	.7	83
Female	2.9	63	.4	63	4.2	63	3.2	63	1.1	63	.3	63
All	2.9	146	1.3	146	3.0	146	2.7	146	1.6	146	.5	146

in the disciplinary major requiring the course rather than gender bias in selecting the course.

Appendix D includes additional data regarding the credit hour distribution among disciplines for the social science distribution requirement.

Natural Sciences

The natural science distribution requirement is met by most students with a combination of courses that are identified with a natural science (NS) course prefix and by disciplinary courses. Whereas all "NS" courses were designed to be used to meet general education requirements, some courses with disciplinary course prefixes have evolved over time into general education courses; i.e., the courses are not taught as introductions to the discipline. The NS sequence designation is not as meaningful a designation as the HU prefix in humanities.

Table 14 contains information, by disciplinary major group, about the distribution of the 12-credit requirement in science among natural science disciplines. The differences in the number of credit hours taken in disciplines, as opposed to the natural science sequence, by disciplinary major groups, can be accounted for by department prescription of courses. Life Science degrees prescribe credits in biology and chemistry. Mathematics/Technology degree programs prescribe physics. Some degree programs in social science prescribe credits in biology.

Table 14.--Natural science credit distribution by disciplinary major group.

Major Area	Biology		Chemistry		Physics		Nat. Sci. Sequence		Other	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	8.1	26	3.7	26		26		26	.2	26
Social Sciences	4.7	31	.2	31	.1	31	6.3	31	.7	31
Business	3.3	39	.3	39	.1	39	7.1	39	.8	39
Math/Technology	2.1	26	1.0	26	5.4	26	3.2	26	.4	26
Criminal Justice	3.7	24	.8	24		24	7.0	24	.5	24
All	4.3	146	1.1	146	1.0	146	5.0	146	.6	146

Table 15 shows disciplinary credit distributions for the natural science requirement for students who have earned all of the credits used to meet the requirement at LSSU as compared to students who have transferred some or all of the courses for the requirement. Transfer students with MACRAO certification are allowed to use mathematics to meet the science requirement if the community college allows it. The "other" category is accordingly greater for transfer students.

Table 16 contains information regarding distribution of credits in natural science disciplines based on the age of the student at graduation. The credit hour distribution among disciplines based on the country in which the secondary education was received is shown in Table 17.

Table 18 is a comparison of male students and female students with respect to credit distribution among natural science disciplines to meet the distributional requirement. Gender bias in the degree groupings coupled with prescribed coursework likely accounts for the differences. Nursing students are included in the Life Science group. These predominantly female students are required to take biology and chemistry to meet the natural science requirement. Engineering technology majors are predominantly male, and physics is a prescribed course.

Appendix E provides additional information pertaining to the distribution of credits among the natural science disciplines to meet the general education requirement.

Table 15.--Natural science credit distribution by transfer status of student.

Transfer Status	Biology		Chemistry		Physics		Nat. Sci. Sequence		Other	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
At least some LSSU NS	4.2	131	1.1	131	1.0	131	5.2	131	.4	131
12 or more NS transferred	5.1	15	1.1	15	.7	15	3.1	15	1.9	15
All	4.3	146	1.1	146	1.0	146	5.0	146	.6	146

Table 16.--Natural science credit distribution by age of student.

Age	Biology		Chemistry		Physics		Nat. Sci. Sequence		Other	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
25+	5.4	50	1.4	50	.8	50	3.6	50	.8	50
25-	3.7	96	.9	96	1.1	96	5.7	96	.4	96
All	4.3	146	1.1	146	1.0	146	5.0	146	.6	146

Table 17.--Natural science credit distribution by country of secondary education.

Secondary Education	Biology		Chemistry		Physics		Nat. Sci. Sequence		Other	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
United States	4.1	103	1.0	103	1.4	103	4.7	103	.7	103
Non-United States	4.7	43	1.3	43	.2	43	5.5	43	.3	43
All	4.3	146	1.1	146	1.0	146	5.0	146	.6	146

Table 18.--Natural science credit distribution by gender of student.

Gender	Biology		Chemistry		Physics		Nat. Sci. Sequence		Other	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Male	3.3	83	.8	83	1.8	83	5.1	83	.8	83
Female	5.6	63	1.5	63		63	4.8	63	.2	63
All	4.3	146	1.1	146	1.0	146	5.0	146	.6	146

Credit Distribution

A second purpose of the researcher in this study was to determine the number of credit hours LSSU students had earned in each of the three distribution areas. Information relating to Research Questions 2 through 6 will be provided.

> Research Question 2: What was the mean number of credits earned in humanities, social science, and natural science by degree area of students, and were differences significant?

Differences Among Disciplinary Majors

Table 19 shows the mean total credits earned in the humanities, social sciences, and natural sciences based on disciplinary major groups. A two-way ANOVA test showed significant differences at the .01 level of significance. Differences were significant among disciplinary major groups for total credits in the three general education fields. Differences were also significant among the three distributional areas. The interaction effect was significant.

Figure 2 shows the total number of credits earned by students in each disciplinary major group per distributional area. The same information is displayed in Figure 3 in a different way: the total number of credits earned in each of the three distributional areas, per disciplinary major group.

One-way ANOVA tests were run to determine whether significant differences existed for the mean credits earned within each distributional area among students in the five disciplinary major groups. In the humanities area, no significant differences were found among students in the five disciplinary major groups.

Table 19.--Mean total credits in general education areas by disciplinary major group.

Major Area	Total Humanities Credits		Total Social Science Credits		Total Natural Science Credits		Total Credits in General Educ. Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	12.5	26	30.4	26	58.0	26	100.9	26
Social Science	13.7	31	81.3	31	15.7	31	110.6	31
Business	13.0	39	32.0	39	15.9	39	60.9	39
Math/Technology	12.4	26	15.2	26	23.3	26	50.9	26
Criminal Justice	12.3	24	46.4	24	17.2	24	75.9	24
All areas	12.8	146	41.5	146	24.9	146	79.3	146

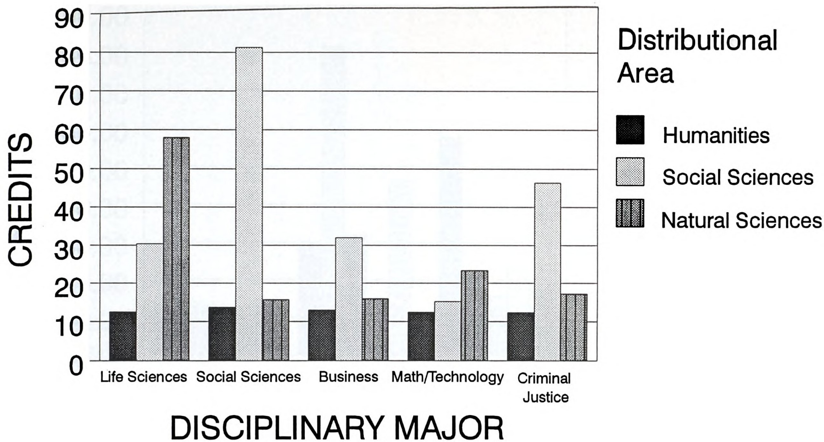


Figure 2: Mean total credits in general education by disciplinary major group.

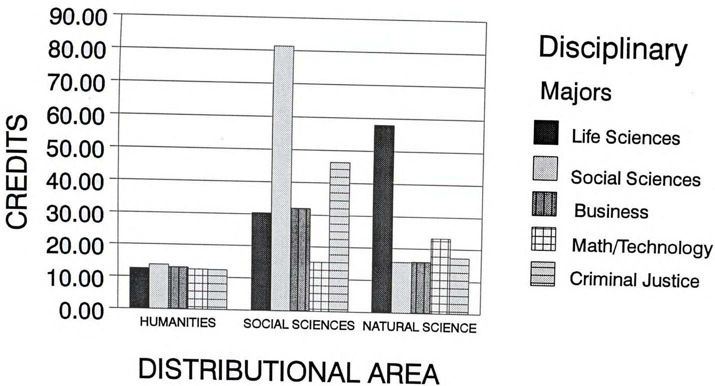


Figure 3: Mean total credits in each distributional area per disciplinary major group.

Table 19 illustrates a high mean credits earned in humanities of 13.7 for Social Sciences, a low mean credits earned in the humanities of 12.3 for Criminal Justice students, and a mean credits earned for all students of 12.8 in the humanities.

One-way ANOVA tests were run to determine whether the mean credits earned in the social sciences were significantly different for students in different major groups. The following differences were significant at the .05 level. Life Science students earned a mean of 30.4 credits in the social sciences, which was significantly greater than the mean for Mathematics/Technology students (15.2 credits) and significantly lower than the mean for Social Science students (81.3 credits). Social Science students earned a mean of 81.3 credits in social science, which was significantly greater than the mean for Life Science students (30.4 credits), the mean for Mathematics/Technology students (15.2 credits), the mean for Business students (32 credits), and the mean for Criminal Justice students (46.4 credits). Business students earned a mean of 32 credits in social science, which was significantly greater than the mean for Mathematics/Technology students (15.2 credits) and significantly lower than the mean for Social Science students (81.3 credits) and the mean for Criminal Justice students (46.4 credits). Mathematics/Technology students earned a mean of 15.2 credits in the social sciences, which was significantly lower than the mean for students in all other disciplinary major groups. Criminal Justice students earned a mean of 46.4 credits in social science, which was significantly greater than the mean credits earned by students in all other disciplinary major groups except Social Science students, who earned significantly greater mean credits.

A one-way ANOVA test for the mean credits earned in natural sciences by students in different disciplinary major groups indicated that students in the Life Sciences earned a mean of 58 credits in natural sciences, which was significant greater, at the .05 level, than the mean credits earned by students in all other disciplinary major groups. No other significant differences among disciplinary major groups were found in the mean credits earned in natural sciences.

The one-way ANOVA test for the mean total credits earned in all three distributional areas by students in the five disciplinary major groups showed the following significant differences (alpha level at .05). Social Science students earned a mean total of 110.6 credits, which was significantly greater than the mean total credits earned by students in Business (60.9 credits), Mathematics/ Technology (50.9 credits), and Criminal Justice (75.9 credits). Life Science students earned a mean total of 100.9 credits in the three distributional areas, which was significantly greater than the mean total credits earned by students in the same three disciplinary major groups: Business, Mathematics/Technology, and Criminal Justice. Business students earned a mean total of 60.9 credits in the three distributional areas, which was significantly less than the mean total credits earned by students in Life Sciences and Social Sciences. Mathematics/Technology students earned significantly fewer mean credits in the general education fields (50.9 credits) than students in all four other disciplinary major groups. Criminal Justice students earned significantly fewer credits (75.9) than students majoring in Life Sciences and Social Sciences, but Criminal Justice students earned significantly more credits than Mathematics/Technology students.

Differences Among Other Student Groups

Table 20 shows the mean credits earned in the three distributional areas of general education by students based on gender distinctions. No significant differences in the mean credits earned by male students and by female students were found. Research Question 3 was:

> Research Question 3: What was the mean number of credits earned in humanities, social science, and natural science by gender of students, and were differences significant?

Research Question 4 was as follows:

> Research Question 4: What was the mean number of credits earned in humanities, social science, and natural science by transfer/nontransfer status of students, and were differences significant?

Research Question 4 is addressed in Table 21. No significant differences, at the .05 level, were found among nontransfer students, transfer students with MACRAO certification, and transfer students without MACRAO certification with respect to the mean total number of credits earned in the three distributional areas of general education.

Table 20.--Mean total credits in general education areas by gender of student.

Gender	Total Humanities Credits		Total Social Science Credits		Total Natural Science Credits		Total Credits in General Educ. Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Male	13.0	83	37.8	83	25.0	83	75.8	83
Female	12.7	63	46.5	63	24.7	63	83.9	63
All	12.8	146	41.5	146	24.9	146	79.3	146

Table 21.--Mean total credits in general education areas by transfer status of student.

Transfer Status	Total Humanities Credits		Total Social Science Credits		Total Natural Science Credits		Total Credits in General Educ. Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Nontransfer	12.4	59	42.1	59	25.7	59	80.2	59
MACRAO	14.3	6	61.8	6	20.2	6	96.3	6
Other transfer	13.1	81	39.6	81	24.7	81	77.4	81
All	12.8	146	41.5	146	24.9	146	79.3	146

Table 22 contains data in response to Research Question 5, which was:

> Research Question 5: What was the mean number of credits earned in humanities, social science, and natural science by traditional/nontraditional age status of students, and were differences significant?

No significant differences were found in the mean total credits earned in general education fields based on the age of students at graduation.

Research Question 6 was as follows:

> Research Question 6: What was the mean number of credits earned in humanities, social science, and natural science by students based on the country in which secondary education was received, and were differences significant?

No significant differences were found between students receiving their secondary education in the United States and those students receiving their secondary education outside the United States with respect to the mean total credits earned in the three distributional fields. Data with regard to Research Question 6 are reported in Table 23.

Class Standing Upon Completion of General Education

Research Questions 7 through 11 relate to the issue of class standing of students when the general education requirements in each of the three distributional areas were completed. Data relating to these questions were obtained from transcript audits. The number of credit hours earned, including transfer credit, when the last course was completed to meet the distributional requirement in each field

Table 22.--Mean total credits in general education areas by age of student.

Age	Total Humanities Credits		Total Social Science Credits		Total Natural Science Credits		Total Credits in General Educ. Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
25+	13.1	50	42.7	50	26.3	50	82.1	50
25-	12.7	96	41.0	96	24.2	96	77.8	96
All	12.8	146	41.5	146	24.9	146	79.3	146

Table 23.--Mean total credits in general education areas by country of secondary education.

Secondary Education	Total Humanities Credits		Total Social Science Credits		Total Natural Science Credits		Total Credits in General Educ. Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
United States	12.8	103	41.4	103	25.2	103	79.4	103
Non-United States	12.9	43	42.0	43	24.2	43	79.1	43
All	12.8	146	41.5	146	24.9	146	79.3	146

was recorded for each student. A two-way ANOVA was used to test for differences among different groups of students and among distributional areas in general education, as well as interaction effects, at the .05 level of significance.

Table 24 is a summary of the response to Research Question 7:

> Research Question 7: What was the mean number of credits earned, by degree area of students, when the humanities, social science, and natural science requirements were met, and were differences significant?

Significant differences in the mean credits earned when a distributional requirement was met among groups of students based on disciplinary major were found (alpha level of .01). Significant differences in the mean number of credits earned when requirements were met were found among the three distributional requirements. Interaction effects between disciplinary major groups and distributional fields were also significant. The differences may relate to the specification of courses to be used for general education purposes on degree audit sheets and to suggested quarter-by-quarter layouts of programs included in the university catalog, in some cases.

The ANOVA tables are presented in Appendix F. Graphical presentations of the distribution of credit hours earned upon completion of distributional requirements are included in Appendix G.

Table 24.--Mean credits earned upon completion of general education requirements by disciplinary major group.

Major Area	Credit Hours Earned When HU Requirement Met		Credit Hours Earned When SS Requirement Met		Credit Hours Earned When NS Requirement Met	
	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	137.9	26	153.2	26	91.3	26
Social Sciences	139.2	31	69.3	31	151.6	31
Business	148.7	39	162.7	39	161.6	39
Math/Technology	173.3	26	132.2	26	156.8	26
Criminal Justice	141.9	24	72.1	24	138.3	24
All major areas	148.0	146	120.8	146	142.3	146

Significant differences were found between transfer students and nontransfer students with respect to the mean credits earned when distributional requirements were met (alpha level of .01). Transfer students often complete degree requirements with a greater number of total credits than minimal requirements due to nonapplicability of some transfer credits. If the transfer student lacks MACRAO certification and therefore must complete general education requirements, the number of credits earned upon completion may be greater. Significant differences were not unexpected. Significant differences in the mean credits earned when distributional requirements were met were found at the .05 level among distributional areas as well. The interaction effect was not significant. Research Question 8 was:

> Research Question 8: What was the mean number of credits earned, by transfer/ nontransfer status of students, when the humanities, social science, and natural science requirements were met, and were differences significant?

The data related to Research Question 8 are summarized in Table 25.

Research Question 9 was:

> Research Question 9: What was the mean number of credits earned by students, based on the country in which the secondary education was received, when the humanities, social science, and natural science requirements were met, and were differences significant?

Significant differences at the .05 level were found between students who had received their secondary education in the United States and those who had received their secondary education outside the United States with respect to the mean credits earned upon completion of the distributional requirements. No interaction

Table 25.--Mean credits earned upon completion of general education requirements by transfer status of student.

Transfer Status	Credit Hours Earned When HU Requirement Met		Credit Hours Earned When SS Requirement Met		Credit Hours Earned When NS Requirement Met		Credit Hours Earned When All General Educ. Requirements Met	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Nontransfer	124	59	103	59	122	59	116	59
Transfer	164	87	133	87	156	87	151	87
All	148	146	121	146	142	146	137	146

effect was found. The mean credits earned upon completion of distributional requirements were significantly different at the .01 level among distributional areas of general education. The data related to this research question are reported in Table 26. The ANOVA tables are included in Appendix F.

Research Question 10 relates to differences among students based on gender. No significant differences in the mean credits earned upon completion of the distributional requirements were found between men and women. The data related to Research Question 10 are presented in Table 27. The question was:

> Research Question 10: What was the mean number of credits earned, by gender of students, when the humanities, social science and natural science requirements were met, and were differences significant?

Research Question 11 addressed differences in mean credits earned upon completion of distributional requirements based on age of the student at graduation. No significant differences, based on age of the graduate, were found in the mean credits earned when distributional requirements were met. Table 28 contains the data for this question, which was:

> Research Question 11: What was the mean number of credits earned, by age of students, when the humanities, social science, and natural science requirements were met, and were differences significant?

Table 26.--Mean credits earned upon completion of general education requirements by country of secondary education.

Secondary Education	Credit Hours Earned When HU Requirement Met		Credit Hours Earned When SS Requirement Met		Credit Hours Earned When NS Requirement Met		Credit Hours Earned When All General Educ. Requirements Met	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
United States	142	103	114	103	139	103	132	103
Non-United States	162	43	137	43	149	43	150	43
All	148	146	121	146	142	146	137	146

Table 27.--Mean credits earned upon completion of general education requirements by gender of student.

Gender	Credit Hours Earned When HU Requirement Met		Credit Hours Earned When SS Requirement Met		Credit Hours Earned When NS Requirement Met		Credit Hours Earned When All General Educ. Requirements Met	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Male	152	83	121	83	148	83	141	83
Female	143	63	120	63	134	63	132	63
All	148	146	121	146	142	146	137	146

Table 28.--Mean credits earned upon completion of general education requirements by age of student.

Age	Credit Hours Earned When HU Requirement Met		Credit Hours Earned When SS Requirement Met		Credit Hours Earned When NS Requirement Met		Credit Hours Earned When All General Educ. Requirements Met	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
25+	161	50	120	50	146	50	142	50
25-	141	96	121	96	140	96	134	96
All	148	146	121	146	142	146	137	146

Factors Affecting Course Selection

Research Questions 12 through 18 related to the persons or factors that influenced the selection of courses to meet distribution requirements in general education. Data were collected from student interviews to respond to these questions. A five-point Likert-type scale was used to record responses to the questions. The questions were grouped, based on a priori assumptions about their relatedness, to obtain summated scales. The summated scales were then used to test for differences in mean values among student groups. Two-way ANOVA tests were used to test for differences among student groups and among distributional areas with respect to the mean response of the importance of factors or persons influencing selection of courses. Significance was tested at the .05 level unless otherwise indicated.

Each research question was analyzed, in addition to the summated scales, for exploratory purposes. Two-way ANOVA tests were used to test for significant differences between student groups and between distributional areas with respect to the mean response of the importance of factors or persons influencing selection of courses.

Data for each research question will be reported. Then data for summated scales will be reported.

Faculty Advice

Research Question 12 was addressed with the data reported in Table 29. The question was:

> Research Question 12: How important was the advice of LSSU faculty advisors or other faculty or staff members to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

A response of 5 indicated great reliance was placed on faculty advice in selecting courses. A response of 1 indicated no reliance was placed on such advice.

Using ANOVA as an exploratory tool, tests of differences were run on the mean responses of students in the five disciplinary major groups and for the three distributional areas of the curriculum. No differences were found in the mean responses among the five disciplinary major groups; however, differences in mean responses of students in the three distributional areas were significant at the .05 level. This finding may be related to the greater degree of perceived freedom in making course selections in the natural sciences and social sciences as compared to the humanities.

One explanation of the finding that most credits earned to meet the humanities requirement are for sequence courses is that students are unaware of options. If students are unaware of options, they might not seek faculty advice in selecting courses for the humanities requirement.

The data from Table 29 are depicted graphically in Figure 4. If a response of 3 is viewed as a neutral response, students do not seek faculty advice to a great degree in making course selections,

Table 29.--Reliance on faculty advice in making course selections.

Major Area	Reliance on Faculty Advice							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	2.21	19	2.26	19	3.00	19	2.49	19
Social Sciences	2.00	23	2.83	23	2.35	23	2.39	23
Business	1.76	29	2.10	29	2.34	29	2.07	29
Math/Technology	1.56	18	2.53	19	2.59	17	2.20	17
Criminal Justice	1.87	15	2.47	15	2.33	15	2.22	15
All areas	1.88	104	2.42	105	2.50	103	2.26	103

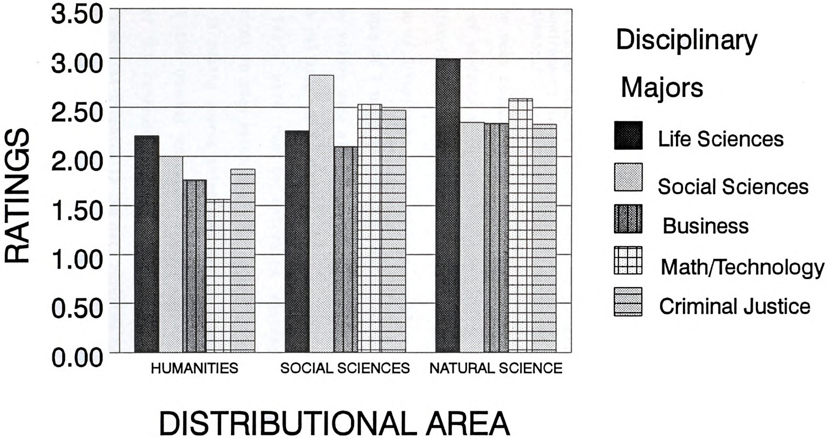


Figure 4: Reliance on Faculty Advice in Course Selection.

irrespective of the disciplinary major or the distributional area of the general education requirement. Appendix H includes additional data showing the distribution of student responses to Research Question 12.

Student Advice

Student advice may be another factor in making course selections. Research Question 13 was as follows:

> Research Question 13: How important was the advice of students or former students to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

The mean student responses to the reliance they placed on the advice of students or former students in making course selections to meet distributional requirements are reported in Table 30. A response of 5 indicated great reliance was placed on such advice and a response of 1 meant no reliance was placed on such advice. Mean response values were higher for the reliance on student advice than for the reliance on faculty advice. As an exploratory technique, ANOVA tests were run to determine whether any significant differences in mean responses relating to the importance of student advice in making course selections existed based on distributional area of the general education requirement or disciplinary major group of the respondent. No significant differences were found. Figure 5 depicts graphically the data reported in Table 30.

The distribution of student responses to the question related to Research Question 13 is included in Appendix H.

Table 30.--Reliance on student advice in making course selections.

Major Area	Reliance on Student Advice							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	2.89	19	3.42	19	2.79	19	3.04	19
Social Sciences	2.78	23	3.17	23	3.17	23	3.04	23
Business	3.07	29	3.21	29	3.03	29	3.10	29
Math/Technology	2.89	18	2.58	19	2.76	17	2.76	17
Criminal Justice	3.33	15	3.60	15	3.33	15	3.42	15
All areas	2.98	104	3.18	105	3.02	103	3.07	103

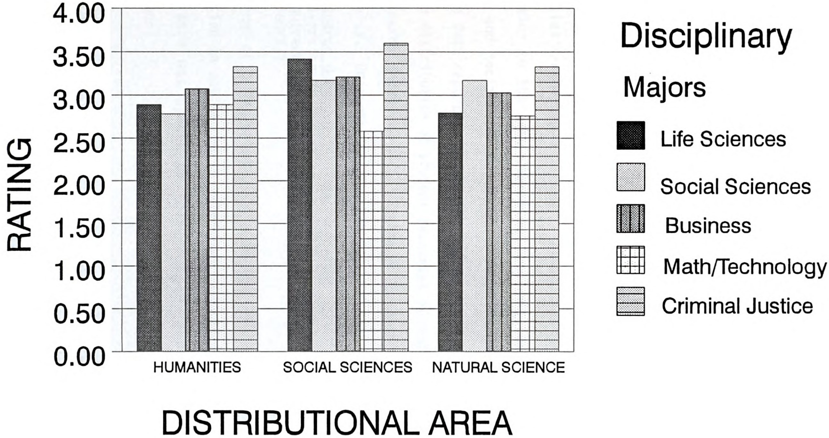


Figure 5: Reliance on Student Advice in Course Selection.

Published Information

Research Question 14 deals with the reliance of students on published information when they make course selections to meet distributional requirements. ANOVA was used as an exploratory tool to determine what differences might be significant. Significant differences, at the .05 level, existed among distributional areas, but not among disciplinary major groups, in the mean responses to the question of reliance on published information in making course selections. If students are unaware of options in meeting the humanities requirement, they might not rely on published information to the same degree as they rely on it for selecting natural and social science courses. This reasoning is compatible with the data reported in Table 31.

The distribution of student responses is included in Appendix H for Research Question 14. Figure 6 presents this information graphically. Research Question 14 was:

> Research Question 14: How important were publications of the university in assisting students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

A response of 5 indicated great reliance was placed on published information in making course selections. A response of 1 indicated no reliance was placed on this information in making course selections.

Table 31.--Reliance on published information in making course selections.

Major Area	Reliance on Published Information							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	3.00	19	3.37	19	3.63	19	3.33	19
Social Sciences	2.91	23	3.26	23	3.09	23	3.09	23
Business	2.83	29	3.00	29	3.21	29	3.01	29
Math/Technology	2.33	18	2.63	19	2.18	17	2.41	17
Criminal Justice	2.47	15	3.00	15	2.73	15	2.73	15
All areas	2.74	104	3.06	105	3.02	103	2.95	103

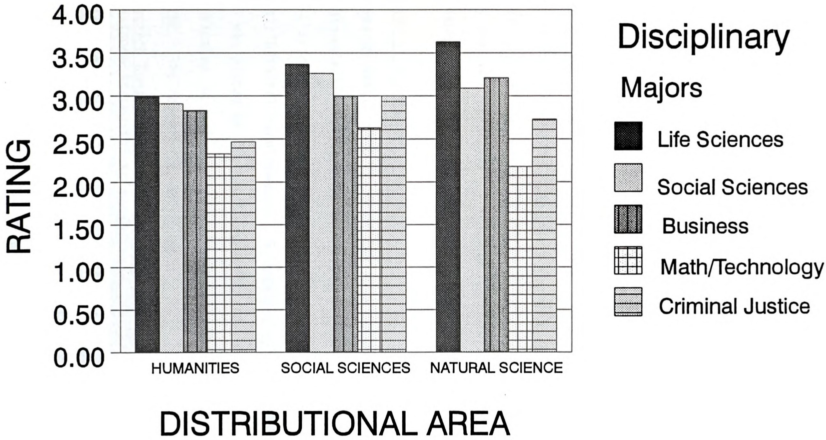


Figure 6: Reliance on published information in course selection.

Information Sources

Research Questions 12, 13, and 14 all dealt with information sources that might be used in course selection. A summated scale was constructed using responses for all three questions. Mean responses for the summated scale were tested for differences based on disciplinary major groups. No significant differences were found at the .05 level. Significant differences were found among the three distributional areas. As discussed above, a plausible explanation for less reliance on information, irrespective of source, in making course selections to meet requirements in the humanities is the perceived unavailability of options. Table 32 contains the mean responses to the summated scale (maximum value is 15; minimum value is 3).

Reputation of Instructor

Research Question 15 involved the mean response of students to the question asking the degree of their reliance on the reputation of the classroom instructor in making their course selections to meet distributional requirements. A response of 5 indicated great reliance was placed on the reputation of the instructor. A response of 1 indicated no reliance was placed on the reputation of the instructor. The research question was:

> Research Question 15: How important was the reputation of the classroom instructor to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

Mean responses to this question, by disciplinary major group of the respondents, and by distributional area of the requirement, are

Table 32.--Reliance on information sources in making course selections.

Major Area	Reliance on Information Sources							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	8.1	19	9.1	19	9.4	19	8.9	19
Social Sciences	7.7	23	9.3	23	8.6	23	8.5	23
Business	7.7	29	8.3	29	8.6	29	8.2	29
Math/Technology	6.8	18	7.7	19	7.5	17	7.4	17
Criminal Justice	7.7	15	9.1	15	8.4	15	8.4	15
All areas	7.6	104	8.7	105	8.5	103	8.3	103

presented in Table 33 and graphically in Figure 7. The distribution of student responses is included in Appendix H. An ANOVA test was performed, for exploratory analysis. Significant differences were found among the three distributional areas in the mean responses of respondents (alpha level of .01). Significant differences were found in the mean responses of students to this question, based on disciplinary major group, at the .05 level. The interaction effect was not significant.

The mean responses were considerably higher for this question (reputation of the instructor) than for the informational source questions except for natural science courses. The greater number of options, in terms of courses or instructors, in social sciences and humanities may account for the relatively lesser role that instructor reputation appears to play in the natural sciences.

Course Content

Table 34 and Figure 8 contain the data related to Research Question 16:

> Research Question 16: How important was the content of the course or subject matter to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

A response of 5 indicated great reliance was placed on the content of the course in making course selections. A response of 1 indicated no reliance was placed on the course content in making course selections. The distribution of student responses to this question is provided in Appendix H.

Table 33.--Importance of reputation of instructor in making course selections.

Major Area	Importance of Reputation of Instructor							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	3.89	19	3.32	19	2.63	19	3.28	19
Social Sciences	3.83	23	3.35	23	2.96	23	3.38	23
Business	4.00	29	3.41	29	2.72	29	3.38	29
Math/Technology	3.11	18	2.58	19	2.53	17	2.73	17
Criminal Justice	4.00	15	3.93	15	3.87	15	3.93	15
All areas	3.79	104	3.30	105	2.89	103	3.33	103

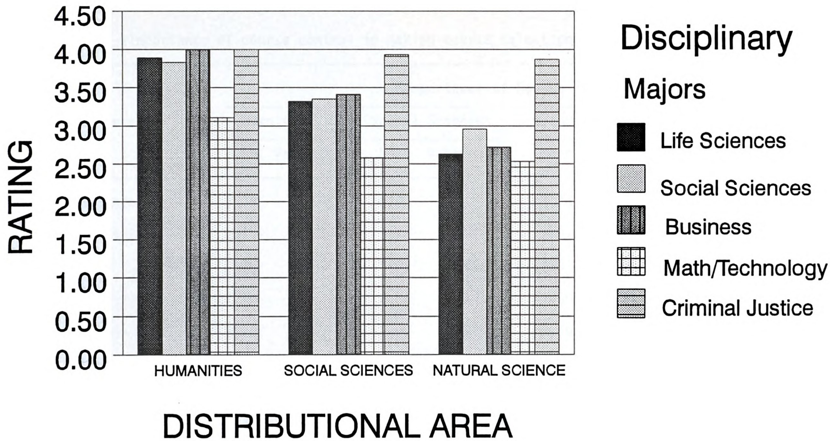


Figure 7: Importance of reputation of instructor in course selection.

Table 34.--Importance of course content in making course selections.

Major Area	Importance of Course Content							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	2.16	19	3.05	19	3.16	19	2.79	19
Social Sciences	2.39	23	3.48	23	2.87	23	2.91	23
Business	2.38	29	2.72	29	2.59	29	2.56	29
Math/Technology	1.83	18	2.84	19	2.59	17	2.49	17
Criminal Justice	2.47	15	3.27	15	2.40	15	2.71	15
All areas	2.26	104	3.05	105	2.73	103	2.69	103

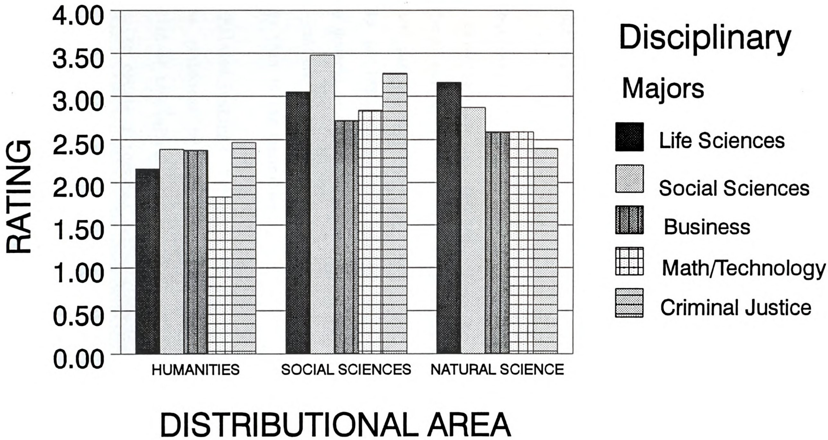


Figure 8: Importance of course content in course selection.

A two-way ANOVA test was performed on the mean responses of students to the question of the degree of reliance they placed on information relating to content or subject matter of the course in making their course selections to meet distributional requirements. The ANOVA was performed for exploratory purposes. No significant differences in the mean responses of students in different disciplinary major groups were found. A significant difference at the .01 level was found for the mean responses of students based on distributional area. The interaction effect was not significant.

A plausible explanation for this difference among distributional areas in the importance of course content in making course selections is the fact that, for many students, courses in the natural and social sciences are prescribed and used to meet both major and general education requirements. For the vast majority of students at LSSU, humanities courses serve the sole purpose of meeting general education requirements. Under these circumstances, course content would be more important in the natural and social sciences than in the humanities.

Course-Related Factors

The responses to Research Questions 15 and 16, related to reputation of the instructor and course content, respectively, were combined to obtain a summated scale, which was then subjected to ANOVA. The summated scale represents information related to the particular course and section (instructor), which affects selection of the course to meet the distributional requirement. The greater the mean response, the greater the reliance students place on this information when they make their course selections. The maximum value of the mean response on this summated scale is 10; the minimum value is 2. The mean response values for this summated scale, by disciplinary major group and by distributional area, are shown in Table 35. No significant differences were found by disciplinary major group in student mean responses. Differences were significant at the .01 level in the mean responses by distributional area. This type of information is most important in making course selections in social sciences and least important in making selections in the natural sciences.

Personal Scheduling Preferences

The data related to Research Question 17 are presented in Table 36 and Figure 9. Two-way ANOVA tests were run for exploratory purposes. No significant differences were found among the responses of students, based on disciplinary major group or distributional area, to the question asking the degree to which their personal commitments or preferences affected their selection of courses to meet distributional requirements. The interaction effect was also not significant. Research Question 17 was:

> Research Question 17: How important was the day of the week or hour of the day the course was scheduled to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

A response of 5 indicated personal preferences and commitments were very important in making course selections; a response of 1

Table 35.--Importance of course information in making course selections.

Major Area	Importance of Course Information							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	6.1	19	6.4	19	5.8	19	6.1	19
Social Sciences	6.2	23	6.8	23	5.8	23	6.3	23
Business	6.4	29	6.1	29	5.3	29	5.9	29
Math/Technology	4.9	18	5.4	19	5.1	17	5.2	17
Criminal Justice	6.5	15	7.2	15	6.3	15	6.6	15
All areas	6.0	104	6.4	105	5.6	103	6.0	103

Table 36.--Importance of personal scheduling preferences in making course selections.

Major Area	Importance of Scheduling Preferences							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	4.11	19	3.74	19	3.68	19	3.84	19
Social Sciences	3.30	23	3.00	23	2.78	23	3.03	23
Business	3.24	29	3.31	29	3.24	29	3.26	29
Math/Technology	3.06	18	2.68	19	2.53	17	2.80	17
Criminal Justice	3.00	15	3.00	15	3.20	15	3.07	15
All areas	3.35	104	3.16	105	3.10	103	3.21	103

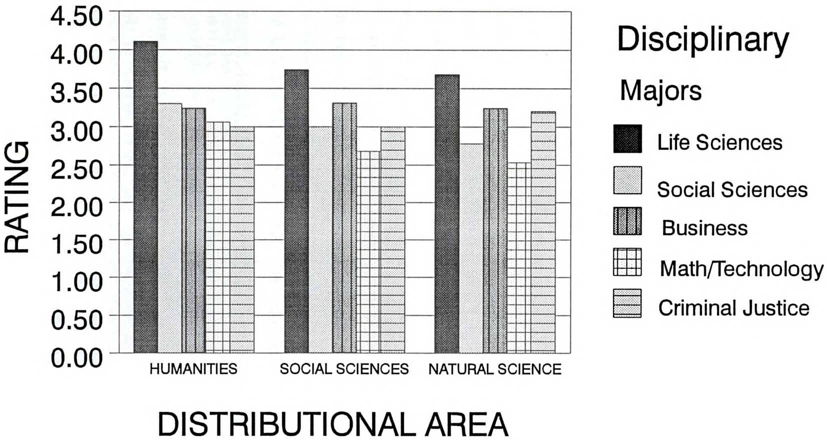


Figure 9: Importance of personal scheduling preferences in course selection.

indicated no importance was attached to such factors in making course selections. Appendix H contains the distribution of student responses to this question.

Scheduling Problems

Research Question 18 was related to the effect of scheduling problems beyond the control of the student (e.g., closed sections, limited course offerings, and conflicts) on course selection to meet general education requirements. Two-way ANOVA tests were run for exploratory purposes. No significant differences were found among distributional areas in the mean responses of students; however, significant differences at the .05 level were found in the mean responses of students in different disciplinary major groups. Students in Life Sciences and Criminal Justice gave mean responses that were significantly greater than the mean responses for students in other disciplinary groups. Scheduling problems had a greater effect on course selection for these students.

The mean response data related to Research Question 18 are displayed in Table 37 and Figure 10. The question was:

> Research Question 18: How important were scheduling problems beyond the student's control, such as full sections or schedule conflicts, in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

A response of 5 indicated that scheduling problems were very important in course selection. A response of 1 indicated that scheduling problems were of no importance in making course selections. The distribution of student responses is included in Appendix H.

Table 37.--Importance of scheduling problems in making course selections.

Major Area	Importance of Scheduling Problems							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	3.11	19	2.84	19	2.79	19	2.91	19
Social Sciences	1.78	23	2.00	23	2.26	23	2.01	23
Business	2.10	29	2.17	29	2.10	29	2.13	29
Math/Technology	1.94	18	2.32	19	2.12	17	2.16	17
Criminal Justice	2.60	15	2.80	15	2.80	15	2.73	15
All areas	2.26	104	2.37	105	2.37	103	2.34	103

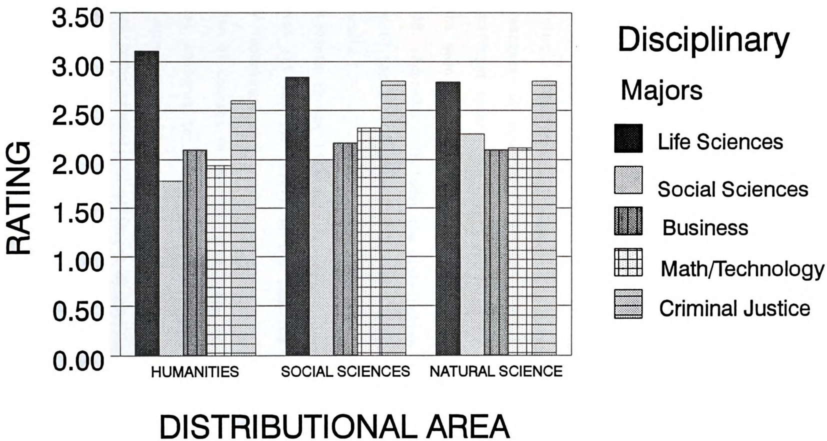


Figure 10: Importance of scheduling problems in course selection.

Scheduling Factors

Responses to Research Questions 17 and 18 were combined to form a summated scale expressing the influence of scheduling problems of the student's own making, or beyond the student's control, on course selection to meet distribution requirements. Mean responses were tested using two-way ANOVA to determine whether significant differences in mean responses existed, based on different disciplinary major groups or distributional areas. No significant differences were found, based on distributional area of the curriculum. Significant differences were found at the .05 level for mean responses of students in different disciplinary major groups. No significant interaction effect was found.

The mean responses for this summated scale are presented in Table 38. Appendix H includes the distribution of student responses related to Research Questions 17 and 18. ANOVA tables are included in Appendix F.

Students in the Life Sciences gave significantly higher mean responses (at the .05 level) on the summated scale, indicating a greater importance of scheduling problems and preferences in their selection of courses in the humanities than the level of importance of these concerns to students from all other disciplinary major groups except Criminal Justice. No significant differences in mean responses among students in different disciplinary major groups was found for the importance of these factors for course selection in the social sciences or natural sciences. A possible explanation for the difference in mean response for the humanities for Life Sciences

Table 38.--Importance of course scheduling in making course selections.

Major Area	Importance of Course Scheduling							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	7.2	19	6.6	19	6.5	19	6.8	19
Social Sciences	5.1	23	5.0	23	5.0	23	5.0	23
Business	5.3	29	5.5	29	5.3	29	5.4	29
Math/Technology	5.0	18	5.0	19	4.6	17	5.0	17
Criminal Justice	5.6	15	5.8	15	6.0	15	5.8	15
All areas	5.6	104	5.5	105	5.5	103	5.6	103

students is the large number of laboratory classes they must take and the greater likelihood of class conflicts that results.

The mean response of students in Life Sciences regarding the importance of scheduling problems and preferences as an influencing factor in their course selections for all three distributional areas combined was significantly higher than the mean responses of students in Social Sciences and Mathematics/Technology (alpha level of .05).

Student Perception of the Benefit of General Education

The final area of focus in this study was the evaluation by students of the contributions of general education to their personal and professional lives, and their assessment of whether more or fewer credits should be required in the different areas.

Differences Among Disciplinary Majors

Table 39 contains the mean responses by students in different disciplinary majors relating the benefit of general education distribution courses to their general development. The mean responses of students in different disciplinary majors relating the benefit of general education distribution courses to understanding of their majors are reported in Table 40. Research Question 19 was:

> Research Question 19: How beneficial to their general development, and to understanding their majors, did students by degree area find courses in the humanities, social sciences, and natural sciences?

A response of 5 indicated that the courses were very beneficial; a response of 1 indicated that no benefit was received. The distribution of student responses is included in Appendix H.

Table 39.--Benefit of general education to general development by disciplinary major group.

Major Area	Benefit to General Development							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	3.26	19	3.58	19	3.79	19	3.54	19
Social Sciences	2.91	23	3.39	23	3.00	23	3.10	23
Business	2.66	29	2.93	29	2.97	29	2.85	29
Math/Technology	2.44	18	2.83	18	2.65	17	2.73	16
Criminal Justice	2.53	15	3.53	15	2.80	15	2.96	15
All areas	2.77	104	3.22	104	3.05	103	3.03	102

Table 40.--Benefit of general education to understanding of major by disciplinary major group.

Major Area	Benefit to Understanding of Major							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	2.16	19	3.16	19	3.58	19	2.96	19
Social Sciences	2.65	23	3.70	23	2.30	23	2.88	23
Business	1.55	29	2.24	29	1.83	29	1.87	29
Math/Technology	1.50	18	1.89	18	2.00	17	1.85	16
Criminal Justice	2.27	15	3.53	15	2.40	15	2.73	15
All areas	2.00	104	2.86	104	2.37	103	2.43	102

The data related to Research Question 19 are displayed graphically in Figures 11 and 12.

Hypotheses 1 through 3 were tested with respect to Research Question 19.

> Hypothesis 1: Students majoring in the natural sciences, mathematics, computer science, engineering technology, and health-related fields will rate natural science courses as more beneficial to their general development and to understanding their majors than will students majoring in other disciplines.

> Hypothesis 2: Students majoring in the social sciences, business, criminal justice, human services, recreation management, and legal assistant studies will rate courses in the social sciences as more beneficial to their general development and to their understanding of their majors than will students majoring in other disciplines.

> Hypothesis 3: Students majoring in social sciences and arts and letters will rate courses in the humanities as more beneficial to their general development and to their understanding of their majors than will students majoring in other disciplines.

A two-way ANOVA test was used, for exploratory purposes, to test for significant differences in the mean response of students in different disciplinary major groups, and among different distributional areas, with respect to the benefits of general education courses to their general development and to the understanding of their majors.

Contributions to general development. Significant differences, at the .01 level, in mean responses of students in different distributional areas were found with respect to the contributions of general education to their general development. No significant differences were found in mean responses of students, by disciplinary major group, with regard to the benefit to general

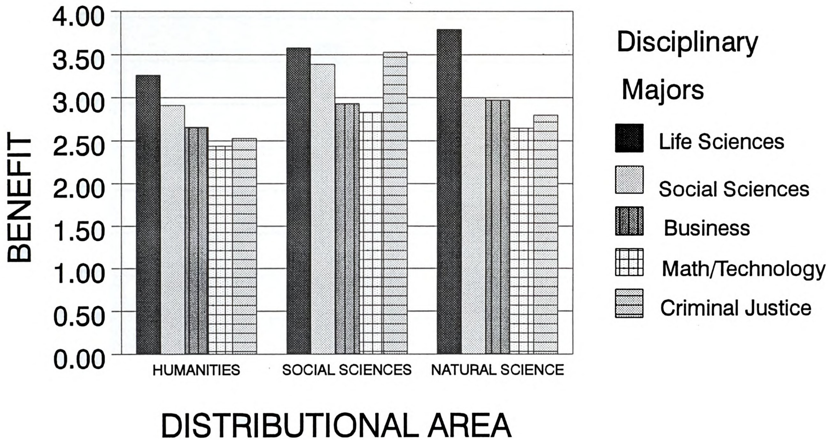


Figure 11: Benefit of general education to general development by disciplinary major group.

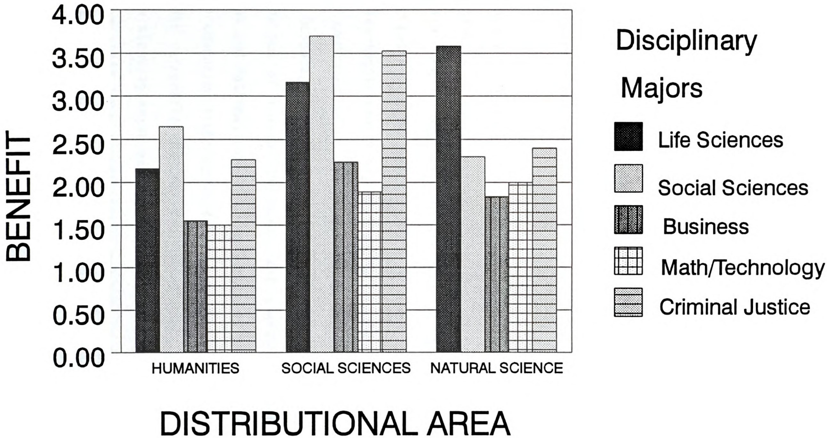


Figure 12: Benefit of general education to understanding of major by disciplinary major group.

development. The interaction effect was not significant with respect to benefit to general development.

Contributions to understanding of major. With respect to the benefit of general education to understanding of their majors, significant differences were found in mean responses of students by disciplinary major, by distributional area, and in terms of the interaction effect, all at the .01 level of significance.

Social Science students gave mean responses significantly higher than Business students and Mathematics/Technology students regarding the benefit of humanities courses, social science courses, and general education distribution courses, in total, to the understanding of their majors.

With respect to the contributions of general education to understanding their majors, Life Science students gave mean responses significantly higher than Mathematics/Technology students in the contribution of social sciences; significantly higher than Social Science, Business, and Mathematics/Technology students in the contribution of natural sciences; and significantly higher than Business and Mathematics/Technology students in the contribution of general education distribution courses, in total.

With respect to the contribution of general education courses to understanding their majors, Criminal Justice students gave mean responses that were significantly greater in the social sciences than the mean responses of students in Business and Mathematics/Technology, and significantly greater mean responses for general education distribution courses, in total, than the mean responses of Business students.

None of the three hypotheses was supported in total.

Differences Among Other Student Groups

Tables 41 and 42 contain the mean responses of students, by gender classification, regarding the contributions of general education distribution courses to their general development and to their understanding of their majors, respectively. Using a two-way ANOVA, for exploratory purposes, no significant differences were found between the mean responses of men and women. No significant interaction effect was found. Differences based on distributional areas were significant, at the .01 level, for mean responses for benefit to general development and for mean responses for benefit to understanding their majors. Research Question 20 was:

> Research Question 20: How beneficial to their general development, and to understanding their majors, did students by gender find courses in the humanities, social sciences, and natural sciences?

Table 41.--Benefit of general education to general development by gender of student.

Gender	Benefit to General Development					
	Humanities		Social Science		Natural Science	
	Mean	Valid N	Mean	Valid N	Mean	Valid N
Male	2.8	61	3.2	61	3.0	60
Female	2.7	43	3.3	43	3.1	43
All	2.8	104	3.2	104	3.1	103

Table 42.--Benefit of general education to understanding of major by gender of student.

Gender	Benefit to Understanding of Major					
	Humanities		Social Science		Natural Science	
	Mean	Valid N	Mean	Valid N	Mean	Valid N
Male	2.0	61	2.7	61	2.2	60
Female	2.0	43	3.0	43	2.6	43
All	2.0	104	2.9	104	2.4	103

Tables 43 and 44 show the findings related to Research Question 21, which was:

> Research Question 21: How beneficial to their general development, and to understanding their majors, did students by transfer/nontransfer status find courses in the humanities, social sciences, and natural sciences?

With respect to the contribution of general education to general development, no significant differences were found in the mean responses of transfer students and nontransfer students. The difference in the mean response based on distributional area was significant at the .01 level. The interaction effect was significant at the .05 level. Humanities received the lowest rating by both transfer and nontransfer students with respect to benefit to general development.

No significant differences were found in the mean responses of students, either by transfer status or by distributional area, in the contribution of courses in general education to understanding of their majors.

Table 43.--Benefit of general education to general development by transfer status of student.

Transfer Status	Benefit to General Development: Humanities		Social Science		Natural Science	
	Mean	Valid N	Mean	Valid N	Mean	Valid N
Nontransfer	2.6	45	3.4	45	2.9	45
Transfer	2.9	59	3.1	59	3.2	58
All	2.8	104	3.2	104	3.1	103

Table 44.--Benefit of general education to understanding of major by transfer status of student.

Transfer Status	Benefit to Understanding of Major: Humanities		Social Science		Natural Science	
	Mean	Valid N	Mean	Valid N	Mean	Valid N
Nontransfer	1.9	45	3.2	45	2.4	45
Transfer	2.1	59	2.6	59	2.3	58
All	2.0	104	2.9	104	2.4	103

Research Question 22 was as follows:

> Research Question 22: How beneficial to their general development, and to understanding their majors, did students by age find courses in the humanities, social sciences, and natural sciences?

Using two-way ANOVA tests for exploratory purposes, significant differences were found at the .01 level for the following: with respect to the mean response of students for the contribution of general education to their general development, differences by age at graduation and the interaction effect; with respect to the mean response of students for the contribution of general education courses to understanding their majors, differences by distributional area. No other differences were found to be significant (see Tables 45 and 46).

Table 45.--Benefit of general education to general development by age of student.

Age	Benefit to General Development					
	Humanities		Social Science		Natural Science	
	Mean	Valid N	Mean	Valid N	Mean	Valid N
25+	3.6	33	3.5	32	3.3	33
25-	2.4	71	3.1	72	2.9	70
All	2.8	104	3.2	104	3.1	103

Table 46.--Benefit of general education to understanding of major by age of student.

Age	Benefit to Understanding of Major					
	Humanities		Social Science		Natural Science	
	Mean	Valid N	Mean	Valid N	Mean	Valid N
25+	2.3	33	3.1	32	2.5	33
25-	1.9	71	2.7	72	2.3	70
All	2.0	104	2.9	104	2.4	103

Hypothesis 4 was supported (for exploratory purposes). Students 25 years of age or older at graduation gave a mean response of 3.625 for the question relating the benefit of humanities to general development. Students under 25 years of age at graduation gave a mean response of 2.414 to the same question. The difference was significant at the .01 level.

> Hypothesis 4: Nontraditional students will rate courses in the humanities as more beneficial to their general development than will other students.

Tables 47 and 48 contain the data related to Research Question 23, which was:

> Research Question 23: How beneficial to their general development, and to understanding their majors, did students by the country in which they received their secondary education find courses in the humanities, social sciences, and natural sciences?

With respect to the benefit to general development, no significant differences in the mean responses of students were found either based on the distributional area or the country in which students received their secondary education. The interaction effect was significant at the .05 level.

With respect to the benefit to understanding their majors, the mean responses of students were significantly different, based on the distributional area, at the .01 level. No other differences were significant.

Table 47.--Benefit of general education to general development by country of secondary education.

Secondary Education	Benefit to General Development					
	Humanities		Social Science		Natural Science	
	Mean	Valid N	Mean	Valid N	Mean	Valid N
U.S.	2.6	73	3.3	73	3.0	72
Non-U.S.	3.1	31	3.0	31	3.1	31
All	2.8	104	3.2	104	3.1	103

Table 48.--Benefit of general education to understanding of major by country of secondary education.

Secondary Education	Benefit to Understanding of Major					
	Humanities		Social Science		Natural Science	
	Mean	Valid N	Mean	Valid N	Mean	Valid N
U.S.	2.0	73	3.0	73	2.4	72
Non-U.S.	2.0	31	2.5	31	2.2	31
All	2.0	104	2.9	104	2.4	103

<u>Desired Changes in Credit Hour Requirements</u>

The data related to students' perceptions of whether credit hours in the distributional areas should be increased, decreased, or remain unchanged are displayed in Table 49 and Figure 13. A response of 5 meant credit requirements should be substantially increased, a response of 3 meant requirements should remain at the current level, and a response of 1 meant credit requirements should be substantially increased. Research Question 24 was:

> Research Question 24: Did students by degree area think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

No significant differences were found using a two-way ANOVA based on mean student responses by disciplinary major group. Differences by distributional area of the general education requirement were significant at the .01 level. The interaction effect was not significant.

The two-way ANOVA test was used for exploratory purposes to determine whether mean responses to the question relating to credit requirement changes were different for men and women. No significant differences were found based on gender. Differences based on distributional area were significant at the .01 level. The interaction effect was not significant. The means are displayed in Table 50. Research Question 25 was:

> Research Question 25: Did students by gender think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

Table 49.--Desired change in general education credit hour requirements by disciplinary major group.

Major Area	Change Credit Hour Requirements							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	2.16	19	3.26	19	2.84	19	2.75	19
Social Sciences	2.43	23	3.00	23	2.91	23	2.78	23
Business	2.24	29	2.62	29	2.62	29	2.49	29
Math/Technology	2.22	18	2.41	17	2.65	17	2.42	16
Criminal Justice	2.40	15	3.00	15	2.67	15	2.69	15
All areas	2.29	104	2.84	103	2.74	103	2.62	102

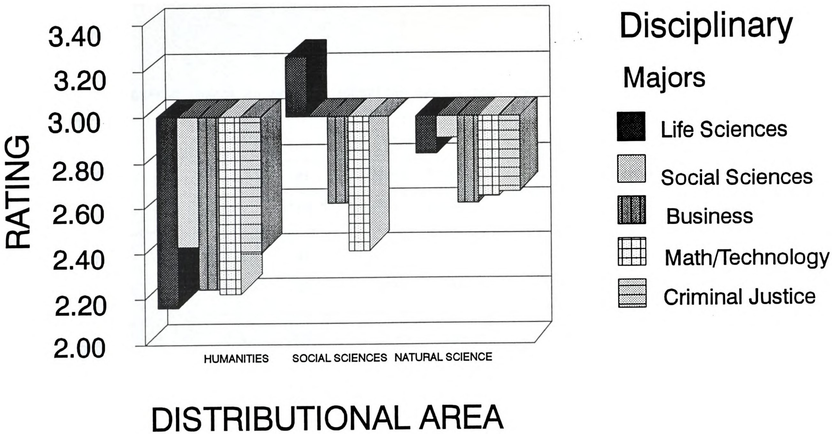


Figure 13: Desired changes in general education credit hour requirements by disciplinary major group.

Table 50.--Desired change in general education credit hour requirements by gender of student.

Gender	Change Credit Hour Requirements							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Male	2.4	61	2.8	60	2.8	60	2.7	59
Female	2.1	43	2.9	43	2.6	43	2.5	43
All	2.3	104	2.8	103	2.7	103	2.6	102

Data relating to Research Question 26 are presented in Table 51. No significant difference in the mean responses of students based on age at graduation was found relating to this research question. Differences based on distributional areas were significant at the .01 level. The interaction effect was not significant. The research question was:

> Research Question 26: Did students by age think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

No significant differences were found in the mean responses of students to the question regarding change in credit requirements based on distributional area, transfer status of students, or interaction effect. Table 52 contains the data for Research Question 27, which was:

> Research Question 27: Did students by transfer/nontransfer status think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

Students receiving their secondary education outside the United States gave a lower mean response to the question regarding changing credit hour requirements. The data are reported in Table 53. Research Question 28 was:

> Research Question 28: Did students by the country in which they received their secondary education think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

The two-way ANOVA test indicated that differences in the mean responses of students to this question were significant, at the .01 level, based on the distributional area, and at the .05 level, based

Table 51.--Desired change in general education credit hour requirements by age of student.

Age	Change Credit Hour Requirements							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
25+	2.4	33	3.0	32	2.7	33	2.7	32
25-	2.3	71	2.8	71	2.7	70	2.6	70
All	2.3	104	2.8	103	2.7	103	2.6	102

Table 52.--Desired change in general education credit hour requirements by transfer status of students.

Transfer Status	Change Credit Hour Requirements							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Nontransfer	2.4	45	3.1	45	2.8	45	2.8	45
Transfer	2.2	59	2.6	58	2.7	58	2.5	57
All	2.3	104	2.8	103	2.7	103	2.6	102

Table 53.--Desired change in general education credit hour requirements by country of secondary education.

Secondary Education	Change Credit Hour Requirements							
	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
United States	2.4	73	2.9	72	2.9	72	2.7	71
Non-United States	2.1	31	2.6	31	2.5	31	2.4	31
All	2.3	104	2.8	103	2.7	103	2.6	102

on the country in which the secondary education was received. No significant interaction effect was found.

Student Evaluation of General Education

A summated scale was created by combining the responses to Research Questions 19 and 24. The maximum mean value for each distributional area was 15. The minimum value was 3. The summated scale represents the perceived value placed on the distributional course in terms of benefit to general development, benefit to understanding of the major, and student evaluation of whether credit requirements should be changed and in what direction. The mean values were subjected to a two-way ANOVA test to find whether differences in mean responses, based on disciplinary major group or distributional area of the course, were significant.

Differences in mean responses were significant at the .01 level based on distributional area of the course and on disciplinary major group of the student respondents. The findings are presented in Table 54.

Using a one-way ANOVA to find significance within each distributional area by disciplinary major grouping, no significant differences (at the .05 level) were found in the evaluation of humanities. No two disciplinary groups were significantly different with respect to the evaluation of social sciences. Life Science students provided a mean rating for natural science courses of 10.2, which was significantly greater (at the .05 level) than the mean rating of Business students of 7.4. For all distributional areas,

Table 54.--Student evaluation of general education.

Major Area	Humanities		Social Sciences		Natural Sciences		All Areas	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Life Sciences	7.6	19	10.0	19	10.2	19	9.3	19
Social Sciences	8.0	23	10.1	23	8.2	23	8.8	23
Business	6.4	29	7.8	29	7.4	29	7.2	29
Math/Technology	6.2	18	7.3	17	7.3	17	7.0	16
Criminal Justice	7.2	15	10.1	15	7.9	15	8.4	15
All areas	7.1	104	9.0	103	8.2	103	8.1	102

Life Science students gave a mean rating of 9.3, which was significantly above (at the .05 level) the mean rating of Business students of 7.2 and the mean rating of Mathematics/Technology students of 7.0.

A t-test was performed to test Hypothesis 5, which stated:

> Hypothesis 5: Students completing their humanities requirements in their junior or senior years will rate courses in the humanities as more beneficial to their general development than will other students.

Hypothesis 5 was not supported. Students who completed the humanities requirement when they had earned 90 or more credits gave a mean rating of 2.8387 using the summated scale described above. Students who completed the humanities requirement before they had earned 90 credits gave a mean rating of 2.1818 on the summated scale. The difference was not significant at the .05 level.

CHAPTER V

CONCLUSIONS

The findings of the researcher in this study lend support to the concerns expressed in the literature and reiterated in Chapters I and II of this dissertation. The major findings of the researcher were the following:

1. The role of the disciplinary major in determining the courses selected by students to meet general education distributional requirements and in determining the breadth of a student's curriculum was substantial.

2. Students' reliance on faculty advice when they made their course selections was limited.

3. Students perceived little value in the contributions of general education courses to their general development or understanding of their majors.

Summary

The following discussion represents a summary of the findings for the six issues investigated in this research.

Issue One

> What courses were selected by students to meet distribution requirements in the humanities, social sciences, and natural sciences?

Freedom of choice in selecting courses to meet the distributional requirements in general education at LSSU is limited by the designation of specific courses to meet both general education requirements and requirements of disciplinary majors. Choice is also limited by students' perceptions of limited options in the humanities.

Issue Two

> How many credit hours were earned in each of the three distributional areas required, i.e., the humanities, social sciences, and natural sciences?

Students earned few credits in the distributional areas of general education outside of the distributional area of their majors. Mean total credits earned in the humanities were near the minimum required. Mean total credits earned in the natural sciences and the social sciences were significantly greater for some disciplinary majors. Business and mathematics/engineering technology majors earned the fewest credits in the three distributional areas. No significant differences were found in the mean total credits earned in any of the three distributional areas, or in the mean total credits earned in the three areas combined, as a function of the gender, age, transfer status, or country of secondary education of students.

Issue Three

> How many credit hours were accumulated when distribution requirements in general education were met?

The findings revealed significant differences among groups of students with respect to this issue; however, the researcher believed that these findings reflected the operational definition used for data collection. A distribution requirement was considered to be met when the last course designated on the degree audit sheet was completed. Departments often designated senior-level courses and, as a consequence, credit hour accumulations were greater in such departments than in other departments. The statistical differences were more a consequence of design than a reflection of alternative patterns in the actual experience of students.

Issue Four

> What factors or individuals were important in assisting students to make their selection of courses to meet distribution requirements?

Of the factors studied, students attached the least importance to faculty advice in making their selections of courses to meet distributional requirements. Reputation of the instructor, followed by personal preferences or commitments with respect to the day of the week or the time of the day, were the most important factors in course selection (see Table 55). Significant differences among disciplinary major groups were found for the importance of instructor reputation and scheduling problems beyond the student's control in making course selections. Significant differences among the three distributional areas of general education were found for the following four factors: faculty advice, published information, reputation of the instructor, and course content. No interaction effects were found.

Table 55.--Importance of factors in making course selections.

Factor	Total	Life Science	Social Science	Business	Math/ Technology	Criminal Justice
Faculty advice	2.26	2.49	2.39	2.07	2.20	2.22
Student advice	3.07	3.04	3.04	3.10	2.76	3.42
Published information	2.95	3.33	3.09	3.01	2.41	2.73
Reputation	3.33	3.28	3.38	3.38	2.73	3.93
Course content	2.69	2.79	2.91	2.56	2.49	2.71
Preferences	3.21	3.84	3.03	3.26	2.80	3.07
Scheduling	2.34	2.91	2.01	2.13	2.16	2.73

Issue Five

> What were the students' perceptions of the benefit of courses in the three distributional areas to their personal development and in understanding their majors?

Significant differences were found by distributional area in the perceived benefit of general education to general development. No significant differences were found among ratings of students based on disciplinary major. Humanities courses were perceived to be least beneficial to general development. Older students rated the benefit of humanities to general development significantly greater than younger students rated the contributions. Students who completed requirements in humanities as juniors or seniors rated the benefit to general development greater, but the difference was not significantly greater than the rating by students who completed the requirement as freshmen or sophomores. No other significant differences among student groups based on gender, transfer status, or nationality classifications were found.

Significant differences were found in the perceived contribution of general education to the understanding of their majors by students with different disciplinary majors and as a function of the distributional area. Interaction effects were found. Students in business and mathematics/engineering technology perceived the least benefit. No significant differences based on age, gender, transfer status, and nationality classifications were reported.

Issue Six

> Did students indicate that credit hour requirements in each of the three distributional areas should be increased, decreased, or remain unchanged?

No significant differences were found in the students' responses to the question regarding changing credit hour requirements based on the disciplinary major, age, gender, or transfer status of students. Significant differences were found in students' responses based on the distributional area. The mean response was lower for humanities, a finding that indicated more students thought requirements should be decreased in this area. Students who received their secondary education outside the United States gave a significantly lower response to this question.

Conclusions

Three concerns of the researcher emerged from the findings in this study:

1. Should the department, through its degree requirements, play such a major role in determining the general education experiences of its students?

2. How can faculty advising for general education purposes be made more effective?

3. How can we help students see the benefit of general education, or how can we make general education more meaningful?

General Education or Specialized Education

Departments play a major role in determining the general education experience of students majoring in their disciplines at

LSSU. The findings revealed that general education course selection was constrained by designation of courses to be used for general education purposes by the major department. Such a practice allowed departments to require a greater number of credits for the major through the practice of double-counting. The practice determines which discipline is used to meet distributional requirements and, in so doing, the actual breadth of a student's curriculum.

The menu of course offerings that may be used to meet general education requirements in the social and natural sciences is long and varied for the student body as a whole, but for a student within a specific degree program, the menu is limited. The question of how much to prescribe and how much to leave to choice may not be an issue at all. A more important concern may be the extent to which general education requirements ought to be determined by disciplinary major requirements.

Institutions undertaking reform of general education should seriously consider the extent to which academic majors should be allowed to prescribe general education courses. The question of to what extent such courses address concerns of general education and to what extent the purposes of specialized education are addressed needs to be asked.

This researcher did not examine the number of credits students earned in the three distributional areas beyond the courses required by the major or the minor. Findings bearing on this question would give a more accurate measurement of breadth.

Faculty Advice and Other Factors

The relatively low reliance students placed on faculty advice when they made their course selections to meet general education requirements may be attributable to a number of factors. Access to faculty members, especially in departments with large numbers of majors, may have been a limiting factor. When students scheduled courses, faculty advisors may not have been able to spend the time needed to discuss general education options. Efforts designed to lengthen the scheduling period, the time when students need information about courses, may increase accessibility of advisors. Reducing the advisee workload may have the same effect, but at the cost of teaming more students with faculty advisors outside their majors.

Second, students may not view faculty in their disciplinary majors as competent advisors for general education purposes, and they may not seek their advice. Faculty members may not view themselves as competent advisors with regard to general education. Faculty members may not value general education, and consequently they may not advise for general education.

Assigning two advisors, one to advise for the major and one who teaches general education coursework to advise for general education purposes, might be helpful; however, the duplication of effort would probably be burdensome, not only to faculty members but also to students, who would be required to see two advisors.

Assignment of faculty advisors from the general education faculty to advise lower-division students with declared majors may

be a means of providing faculty advice regarding general education courses. Faculty members outside the major resist advising students in the major, claiming they lack competence in advising for major requirements. The argument for assignment of a faculty member in the major area as the academic advisor, based on his/her expertise in the major, is an argument that general education is less important than coursework in the major and that the faculty advisor does not need to be competent to advise for general education.

For the lower-division student who has declared a major, with all the certainty that is possible at that state of his/her education, advising by a faculty member outside the major should be uncomplicated, as required courses in the major are usually introductory in nature and clearly spelled out. The assignment of faculty members in the major as academic advisors is more important when students, as upperclassmen, are selecting electives in the major, and for lower-division students who are uncertain of their specific majors, but who know the general areas in which they wish to study. Inservice training of general education faculty members with regard to specialized curricula or of specialized faculty members with regard to the general education curriculum may improve the quality of advising.

Information from other sources may be currently sufficient so that students do not need to seek advice from faculty members regarding general education. Conversely, publications can be improved to provide more information regarding general education options. Peer advising, or group advising, can relieve faculty members for advising by permitting peer advisors to assume more of the responsibility for routine scheduling tasks. Training of peer advisors may be a desirable investment to provide accurate information. Use of students in the advising function may be desirable if the lack of reliance on faculty advice is caused by students' reluctance to seek faculty advice and not inaccessibility of faculty advisors.

If students are given choices in a distributional model of general education, faculty advice should be one source of information that students would use to make intelligent, informed decisions. The findings of the researcher in this study suggest that students will rely on faculty advice to a greater extent where the choices are greater. Although the ratings given to the importance of this factor were low, significant differences in the importance of faculty advice in selecting courses in the three distributional areas were found. Students placed greater reliance on faculty advice in the selection of courses in the natural and social sciences than they placed on that factor when selecting courses in the humanities. The concentration of credits in the humanities sequence courses suggests that students did not understand the options that were available.

Students relied on published information regarding courses to make choices in the natural and social sciences more than they relied on that information to make course selections in the humanities. The summated scale combining responses to the three questions concerning sources of information (faculty advice, student advice, and publications) indicated significant differences in the degree of students' reliance on these information sources in making course selections in the three distributional areas. The greater student reliance on these information sources in the areas where students had, or perceived they had, greater latitude in making choices to meet requirements lends support to the conclusion that students will make informed choices when they have the freedom to do so.

The type of information sought by students was related to the freedom allowed to students in making course selections. The importance of information regarding instructor reputation was inversely related to the number of course options allowed students. The importance of course content was directly related to the number of course options. When given the freedom to select courses, students placed greater importance on course content. When course options were limited, students placed greater importance on instructor reputation. When course options and instructor option were both greater, students placed greater importance on both course content and instructor reputation.

The relatively high mean response for the importance of the reputation of the instructor in making course selections suggests the need to explore in greater depth what students mean by this response. Are students looking for good instruction? What is the relationship of evaluation methods and grading scales to this concern? The student response strategies indicate the importance of giving attention to instruction and professional development, as well as curriculum, when considering changes in general education.

Scheduling of general education classes was important for LSSU students. The high rating given to personal preferences and commitments is evidence that general education should not be scheduled at unpopular times merely because the course is required. Scheduling problems, on the other hand, did not seem to be an important issue at LSSU, except for students majoring in programs with laboratory and internship classes.

Connections

Students in vocationally oriented programs attached less value to general education in terms of its contribution to their understanding of their major. Students generally attached less value to humanities coursework for its contribution to their general development. By contrast, students in Life Science and Social Science major groups attached more significance to general education, within the distributional area of their majors, for its contribution to their understanding of their majors. Students must be helped to make connections between their studies in general education and their studies in their specialized majors. The need for coherence of general education and integration with the major is part of the national debate and is reflected in these findings.

The sequencing of general education courses within the four-year curriculum is a factor that may help students make the connections. The findings that related the perceived benefits of humanities to the student's general development with age and class standing suggest that general education should be scheduled over the full four years of the baccalaureate program. Integration of general education with the major may be easier to accomplish after the student has a good grounding in the major.

Meaningful orientation programs and the freshman-year experience may provide opportunities to explain the potential benefits of general education to students before coursework is begun. The finding that students fail to recognize the benefits of general education might provide the impetus to closely examine the means by which general education courses are delivered. Class size, methods of instruction, professional development of faculty members, and course content are important issues for consideration.

Methodology and Issues for Further Study

Modification of this model to meet the particular characteristics and needs of other institutions should result in a model that will prove useful elsewhere in assessing general education. Decisions regarding the advising system for general education and program articulation with other institutions for transfer of general education will be informed by data obtained from this model.

This researcher would make the following modifications in the model before using it at LSSU. The specification of courses used to meet the general education requirements as those courses listed on

the degree audit forms filed with the Registrar led to the collection of data that were not useful. For example, information regarding the class standing of students when they completed their general education requirements was determined by the courses so designated as general education. Often this proved to be arbitrary. The alternative of specifying general education courses as the first 12 credits listed on the transcript would have led to very different results. The same bias was evident in the specification of the disciplines represented by the course selections. The time required in the transcript audit to collect this information might be used more effectively in collecting other data.

Second, this researcher would seek more detailed information regarding faculty advice, student scheduling preferences, and the meaning of reputation of the instructor from the student interviews. More open-ended questioning of a smaller subsample of the respondents might provide useful data. Qualitative methods, including focus groups, may have yielded richer and more persuasive data.

Third, data would be collected with respect to the number of credits earned in each of the three distributional areas that was not used to meet major or minor requirements. This number might better represent the credits devoted to general, as opposed to specialized, education.

The researcher's purpose was to develop a model to evaluate students' responses to distributional requirements, the bases for students' choices, and students' perceptions of benefit. Institutions considering changes in their general education requirements should take these factors into consideration when developing the curriculum. Responsive, issue-oriented evaluation can be a useful tool to help bring about meaningful change.

STUDENT CHOICES AND CREDIT DISTRIBUTION IN GENERAL EDUCATION: AN EVALUATION MODEL

By

Bruce T. Harger

VOLUME II

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Teacher Education

1991

APPENDICES

APPENDIX A

LSSU GENERAL EDUCATION REQUIREMENTS

LAKE SUPERIOR STATE UNIVERSITY offers bachelor's, or baccalaureate, degrees, associate degrees, and certificates. Degrees are offered in a wide variety of fields. Many requirements for degrees in particular fields of study are specific and may be found in other parts of the Catalog. However, some requirements apply to all, or almost all, degrees — especially the bachelor's degree. These are discussed below.

BACHELOR'S DEGREES: A bachelor's degree requires a minimum of 186 hours (credits) for graduation. These required hours fall into four categories: general education, bachelor of arts, bachelor of science or cognate requirements, departmental requirements, and free electives. All bachelor's degree candidates must also demonstrate proficiency in mathematics and writing.

General education

51 HOURS

AS THE NAME APPLIES, general education consists of courses required of all students regardless of their specialized area of study. The purpose of general education is to develop skills and knowledge useful for all students, regardless of their career choices. Thus, requirements in English and speech will enhance fundamental skills of writing and speaking. The physical education requirement will lay the foundation for a lifetime of physical activity that will promote health and well-being. Requirements in humantities, natural sciences, and social sciences broaden intellectual perspective and familiarize students with fundamental fields of human knowledge.

ENGLISH (9 credit hours): EN101-102-103 meet the nine credit-hour requirement. Everyone must take EN101. However, some bachelor of arts and bachelor of science degrees allow EN101, EN190, EN390. EN190 may be substituted for EN102. Do not take EN102 and EN190, or you will be duplicating credits. You may, however, take both EN103 and EN390 and receive credit for them.

SPEECH (3): SD110, Fundamentals of Speech is required of all students.

HUMANITIES (12): HU295-296-297 meets the 12 credit-hour humanities requirement. Courses in philosophy and music, art, theatre appreciation and mythology, religion and second-year foreign language may be substituted. If substitute courses are taken, a maximum of 6 credit hours may be taken in one area. For example, MU230 and 231 may be substituted for 6 of the 12 credit-hour humanities requirement, but MU232 with MU230 and 231 could not be counted toward the 12 credit-hour requirement. Students taking art or music courses must take appreciation courses, such as AT268 or MU230, not the skill courses such as AT125-126-127 or MU112-113-114.

SOCIAL SCIENCES (12): Any combination of economics, geography (except GG106, GG108, GG370, NS105 and NS107), history, political science, psychology and sociology may be taken.

NATURAL SCIENCES (12): Both a physical and a biological science course must be taken. BIOLOGICAL SCIENCES: NS103 or any BL course except BL130, BL190, or BL280, will meet this requirement; plus: PHYSICAL SCIENCES: Any CH, GE, or PH course may be taken and GG106, GG108 are acceptable courses. (Other GG courses are considered social science courses.) NS101, 102, 104, 105, 107 or NS119 may be taken.

PHYSICAL EDUCATION (3): Three different 100-level activity courses.

BA or BS requirements

12 HOURS

BOTH bachelor of arts and bachelor of science degrees are offered. The requirements differ for these two kinds of degrees. These requirements are sometimes referred to as "cognate requirements."

BACHELOR OF ARTS: This degree requires a minimum of one year (12 hours) of a modern foreign language. Some majors require the second year for a total of 24 hours in a foreign language.

BACHELOR OF SCIENCE: This degree requires a minimum of 12 quarter hours of social science, natural science or mathematics beyond those courses used to meet general education requirements. Specific requirements are usually included with the departmental curriculum. Foreign language is generally not required but is recommended.

Departmental requirements

75 HOURS MINIMUM

MOST DEGREES require at least one major and one minor. Students will be assigned a faculty advisor from their major department. Majors and minors are specifically defined by the department concerned.

Free electives

IN ADDITION to all of the above requirements students must select the necessary hours and courses to complete a minimum of 186 quarter hours.

Proficiency requirements

MATHEMATICS: Students seeking two- or four-year degrees are required to demonstrate competence in mathematics at approximately the level of high school first-year algebra. Testing is in two steps: arithmetic skills followed by elementary algebra skills. Both the counseling center and the department of computer, geologic, and mathematical sciences administer exams. Students can satisfy the mathematics competency requirement in the following ways: (1) Score 15 or higher on the intermediate algebra placement exam, given at the time the student enters the University, (2) Take and pass the algebra skills exam (which is given only to students who have passed the arithmetic skills exam or MA090), (3) Complete a Lake Superior State University mathematics course at MA091 or higher. Transfer students who have previously completed a course equivalent to MA092, or higher (specifically excluding MA207), with a grade of C, or higher, will have satisfied the University's mathematics proficiency graduation requirement. The student's transfer credit evaluation form must indicate that LSSU's math proficiency requirements have been satisfied. **WRITING COMPETENCY EXAMINATION:** All students who enter or re-enter LSSU, beginning with the 1983-84 academic year, must pass a writing competency examination as part of their graduation requirements. **FRESHMEN** will be administered this examination during the final exam period following completion of Freshman English III, EN103. **NEW TRANSFER STUDENTS**, returning students who had interrupted their education and have re-entered, and current students may take the writing competency examination by appointment at Brown Hall. For examination appointments call Brown Hall, extension 452.

LAKE SUPERIOR STATE UNIVERSITY 9/90

Quarter System **Degree Requirements**

(Refer to Pages 60-61 of 1988-90 and 1990-91 Catalog)

I. **General Education** (51; Number of credits required for each category is in parenthesis)

English (9) - EN101, EN102 or EN190, and EN103 or EN390

Speech (3) - SD110

Humanities (12) - Any HU course or courses, or any of the courses AT267, 268, 269; FR271, 272; GN281, 282; MU230, 231, 232, 240; PL201, 202, 203, 301; SD361, 362; SP291, 292, 301, 302, 303; any second-year foreign language course; with a maximum of six credits per discipline or total in foreign languages (excluding HU) counting for this requirement.

Social Science (12) - Any combination of courses in economics (EC), geography (GG; except GG106 and GG108), history (HS), political science (PS), psychology (PY) or sociology (SO) for which credit adds to twelve.

Natural Science (12) - At least one course from each of the following two categories
Life sciences - BL101, 102, 105, 121, 122 or NS103
Physical sciences - CH112; GE101,102, 110; GG106, 108; NS101, 102, 105, 107, 119; PH201, 202, 207, 208

Physical Education (3) - Any three different 100 level physical education (PE) activities courses (excluding PE130). (One credit from each of PE208 and PE209 may be used for this requirement.)

II. **BA and BS Requirements** (12 credits)

Bachelor of Arts Degree - one year of a modern foreign language (if taken at LSSU, this would be FR171-3 or 271-3; GN181-3 or 281-3; SP191-3 or 291-3)

Bachelor of Science Degree - at least twelve credits, in addition to courses used for general education requirements (above), from categories of social science, natural science (see above) or mathematics (MA).

III. **Specific departmental requirements** of the department offering the desired degree. This includes elective courses chosen so that minimum total credits specified for the degree have been earned. (This latter total may range from 186 to 202 credits.)

IV. **Competency in mathematics and writing.** All degrees require that students demonstrate competency in mathematics and writing. See the University Catalog and term scheduling booklets for specific information.

V. **Miscellaneous graduation requirements** such as residency and minimum grade point averages (in major and overall) are stated on pages 10-12 of the Catalogs for 1988-90 and 1990-91.

APPENDIX B

INTERVIEW GUIDE AND INSTRUCTIONS

Instructions to Interviewer

Telephone contacts with respondents

You should cover the following in your telephone contacts with respondents.

a. identify yourself;
b. identify your task (research project) and course (marketing research);
c. explain in general terms the research project (study of general education requirements; seeking information from graduating seniors);
d. indicate that their participation is important; the interview will take under one-half hour; the interview will be scheduled at their convenience
e. mention the $50 lottery as an inducement.

Smile when you are talking!

A sample script follows. You may want to use it initially and then develop your own as you become comfortable.

> Hello. My name is Jill Jones. Our marketing research class is conducting a study as part of a class project. Your name has been chosen as part of the sample.
>
> The research deals with the opinions of graduating seniors about the general education requirements. The results will be used to develop and schedule courses. The interview will take less than half an hour of your time.
>
> As an added incentive, your name will be placed in a lottery with names of other participants. One name will be drawn for a $50 prize.
>
> Your participation is important. What time would be convenient for our interview?

Then schedule the interview by time and place.

Completing the Interview Guide

a. attached to each interview guide is a sheet with the scaled responses for questions five through fourteen. Use this sheet to help students choose their responses. This sheet has the name of the student listed. Add the telephone number and return with the completed interview guide. The sheet will be used in the drawing for the $50 prize.

b. Use red ink in coding the interview guides.

c. The interview guides can be picked up and returned to the department office (207 South Hall). The ID number, major and gender will be coded. The guides will be organized by group (A,B,C,D,E) and number. Be careful to match the guide to the respondent.

Introductory comments

You have been selected as part of a sample of graduating seniors to answer questions regarding general education courses. We are particularly interested in the courses you selected to meet requirements in the social sciences, natural sciences and the humanities. Your answers will help us to improve the general education requirements. We're going to look at course selection, scheduling, advising and instruction.

Your privacy will be protected. Your responses will not be connected to your name in any way. The interview will take under 30 minutes to complete. Thank you for your cooperation.

1.	ID Number	___ ___ ___ 1 2 3
2	Major	___ ___ ___ 4 5 6
3.	Gender	___ 7

Interview Guide

1. In what country did you complete your high school education?

    1. U.S.

    2. non-U.S. ____ 8

2. Will you be 25 years or older when you graduate, or under 25?

    1. 25 or older

    2. 24 or younger ____ 9

3. Do you have transfer credit from a Michigan Community College?

    1. yes (go to question 3a)

    2. no (go to question 3b) ____ 10

3a. Did you meet your general education requirements under the MACRAO Agreement? (You may need to read the explanation of the MACRAO Agreement at this point).

    1. yes (go to question 4)

    2. no (go to question 3c) ____ 11

    3. don't know (go to question 3c)

3b. Did you transfer credit from any other college, university or grade 13?

    1. yes (go to question 3c)

    2. no (go to question 4) ____ 12

3c. Did you transfer any credits which were used to meet general education requirements in the

humanities? which courses?

    1. yes

    2. no ____ 13

the social sciences? which courses?
1. yes

2. no ____ 14

the natural sciences? which courses?
1. yes

2. no ____ 15

4. What was your class status when you completed your course requirements in the humanities?
1. freshman

2. sophomore

3. junior ____ 16

4. senior

The next series of questions will ask you to give a numerical response on a scale of one to five. You will be asked to respond to the same questions regarding the choices you made to meet your general education requirements in the social sciences, natural sciences and humanities. Please use this chart (hand respondent chart now) to give me your numerical reponse.

(AS YOU ASK EACH QUESTION, POINT TO THE APPROPRIATE SCALE AND STATE THE QUESTION NUMBER.)

The following questions are about the courses you took to meet your humanities requirement.

5. How much did you rely on the advice of your faculty advisor, or other faculty or staff member, when you selected courses to meet the general education requirements in the humanities?

   5 4 3 2 1 ___ 17

   For question 5, a response of five represents great reliance was placed on such advice and a response of one means no reliance was placed on such advice.

6. How much did you rely on the advice or recommendations of students or former students when you selected courses to meet the general education requirements in the humanities?

   5 4 3 2 1 ___ 18

   For question 6, a response of five represents great reliance was placed on such advice and a response of one means no reliance was placed on such advice.

7. How much did you rely on printed information, such as the catalog, admissions brochures, departmental curriculum guides or course outlines, when you selected courses to meet the humanities requirement?

   5 4 3 2 1 ___ 19

   For question 7, a response of five represents great reliance was placed on published information and a response of one means no reliance was placed on published information.

8. How much did you rely on the reputation of the classroom instructors when you selected courses to meet the humanities requirements?

   5 4 3 2 1 ___ 20

For question 8, a response of five represents great reliance was placed on the reputation of the classroom instructor and a response of one means no reliance was placed on the reputation or the reputation was unknown.

(If the response is 3 or greater, seek elaboration: In what way did the reputation of the instructor affect your choices?)

e.g. good/bad instruction; easy/fair tests;

9. To what extent was the content or subject matter of the course important in selecting courses to meet the humanities requirement?

5 4 3 2 1 ___ 21

For question 9, five represents that the subject matter was of great importance in making your selection and one represents that this was of no importance or the subject matter was not known.

(If the response is 3 or greater, seek elaboration: In what way did the knowledge of course content affect your choices? How did you gain this knowledge of course content?)

e.g. wanted to know more; required by major/minor

10. Students might avoid taking classes on certain days or at certain times because of personal preferences or commitments. To what extent were the days of the week, or the time of the day, important in making your selection of courses to meet the humanities requirement?

5 4 3 2 1 ___ 22

For question 10, five represents that great importance was placed on the time of day or day of week in making selections and one represents that this factor was of no importance in making selections.

(If the response is 3 or greater, seek elaboration: In what way did the scheduling of courses affect your choices?

e.g. avoided 8 o'clocks; had to work afternoons

11. Students might select a particular course because of scheduling problems with other courses. Other courses may not have been offered that term or sections may have been full. Other courses might have been in conflict with required courses. To what extent were scheduling problems a factor in your selection of courses to meet the humanities requirement?

5 4 3 2 1 ___ 23

For question 11, five represents that scheduling problems were substantial factors in making selections and one represents that this factor was of no importance in making selections.
(If the response is 3 or greater, seek elaboration: Explain what courses you were unable to take, or what courses you were forced to take, because of the lack of course availability or scheduling conflict.)

e.g. desired course not offered or section full; conflict

12. How beneficial to your general development were the contributions of courses in the humanities?

5 4 3 2 1 ___ 24

For question 12, five represents that humanities courses were very beneficial to your general development. One represents that humanities were not beneficial at all to your general development.

13. How beneficial in understanding your major were the contributions of courses in the humanities?

5 4 3 2 1

___
25

For question 13, five represents that humanities courses made very valuable contributions to your understanding of your major. One represents that humanities were not beneficial at all in your major.

14. The university is considering changes in the general education requirements. Do you think the number of credits required in humanities should be increased or decreased?

5 4 3 2 1

___
26

For question 14, a response of five represents a substantial increase in credits should be required; a response of three means the number of credits required should remain unchanged; a one means the number of credits required should be substantially reduced.

This series of questions concerns the social science equirement in general education.

4a. What was your class status when you completed your course requirements in the social sciences?

1. freshman

2. sophomore

3. junior ___ 27

4. senior

5a. How much did you rely on the advice of your faculty advisor, or other faculty or staff member, when you selected courses to meet the general education requirements in the social sciences?

5 4 3 2 1 ___ 28

For question 5, a response of five represents great reliance was placed on such advice and a response of one means no reliance was placed on such advice

6a. How much did you rely on the advice or recommendations of students or former students when you selected courses to meet the general education requirements in the social sciences?

5 4 3 2 1 ___ 29

For question 5, a response of five represents great reliance was placed on such advice and a response of one means no reliance was placed on such advice.

7a. How much did you rely on printed information, such as the catalog, admissions brochures, departmental curriculum guides or course outlines, when you selected courses to meet the social science requirement?

5 4 3 2 1 ___ 30

For question 7, a response of five represents great reliance was placed on published information and a response of one means no reliance was placed on published information.

8a. How much did you rely on the reputation of the classroom instructors when you selected courses to meet the social science requirement?

5 4 3 2 1 ___ 31

For question 8, a response of five represents great reliance was placed on the reputation of the classroom instructor and a response of one means no reliance was placed on the reputation or the reputation was unknown.

(If the response is 3 or greater, seek elaboration: In what way did the reputation of the instructor affect your choices?)
e.g. good or bad instruction; easy/fair tests

9a. To what extent was the content or subject matter of the course important in selecting courses to meet the social science requirement?

5 4 3 2 1 ___ 32

For question 9, five represents that the subject matter was of great importance in making your selection and one represents that this was of no importance or the subject matter was not known.

(If the response is 3 or greater, seek elaboration: In what way did the knowledge of course content affect your choices? How did you gain this knowledge of course content?)

e.g. wanted to know more: required by major or minor

10a. Students might avoid taking classes on certain days or at certain times because of personal preferences or commitments. To what extent were the days of the week, or the time of the day, important in making your selection of courses to meet the social science requirement?

5 4 3 2 1 ___ 33

For question 10, five represents that great importance was placed on the time of day or day of week in making selections and one represents that this factor was of no importance in making selections.
(If the response is 3 or greater, seek elaboration: In what way did the scheduling of courses affect your choices?)

e.g. avoided 8 o'clocks; had to work afternoons

11a. Students might select a particular course because of scheduling problems with other courses. Other courses may not have been offered that term or sections may have been full. Other courses might have been in conflict with required courses. To what extent were scheduling problems a factor in your selection of courses to meet the social science requirement?

5 4 3 2 1 ___ 34

For question 11, five represents that scheduling problems were substantial factors in making selections and one represents that this factor was of no importance in making selections.
(If the response is 3 or greater, seek elaboration: Explain what courses you were unable to take, or what courses you were forced to take, because of the lack of course availability or scheduling conflict.)

e.g. desired course not offered or section full; conflict

12a. How beneficial to your general development were the contributions of courses in the social sciences?

5 4 3 2 1

___
35

For question 12, five represents that social science courses were very beneficial to your general development. One represents that social sciences were not beneficial at all to your general development.

13a. How beneficial in understanding your major were the contributions of courses in the social sciences?

5 4 3 2 1

___
36

For question 13, five represents that social science courses made very valuable contributions to your understanding of your major. One represents that social sciences were not beneficial at all in your major.

14a. The university is considering changes in the general education requirements. Do you think the number of credits required in the social sciences should be increased or decreased?

5 4 3 2 1

___
37

For question 14, a response of five represents a substantial increase in credits should be required; a response of three means the number of credits required should remain unchanged; a one means the number of credits required should be substantially reduced

These questions are about the requirements in the natural sciences.

4b. What was your class status when you completed your course requirements in the natural sciences?

1. freshman
2. sophomore
3. junior
4. senior

___
38

5b. How much did you rely on the advice of your faculty advisor, or other faculty or staff member, when you selected courses to meet the general education requirements in the natural sciences?

5 4 3 2 1

___
39

For question 5, a response of five represents great reliance was placed on such advice and a response of one means no reliance was placed on such advice.

6b. How much did you rely on the advice or recommendations of students or former students when you selected courses to meet the general education requirements in the natural sciences?

5 4 3 2 1

___
40

For question 5, a response of five represents great reliance was placed on such advice and a response of one means no reliance was placed on such advice.

7b. How much did you rely on printed information, such as the catalog, admissions brochures, departmental curriculum guides or course outlines, when you selected courses to meet the natural science requirement?

5 4 3 2 1

___
41

For question 7, a response of five represents great reliance was placed on published information and a response of one means no reliance was placed on published information.

8b - How much did you rely on the reputation of the classroom instructors when you selected courses to meet the natural science requirement?

5 4 3 2 1 ___ 42

For question 8, a response of five represents great reliance was placed on the reputation of the classroom instructor and a response of one means no reliance was placed on the reputation or the reputation was unknown.
(If the response is 3 or greater, seek elaboration: In what way did the reputation of the instructor affect your choices?)

e.g. good or bad instruction; fair or easy tests

9b. To what extent was the content or subject matter of the course important in selecting courses to meet the natural science requirement?

5 4 3 2 1 ___ 43

For question 9, five represents that the subject matter was of great importance in making your selection and one represents that this was of no importance or the subject matter was not known.
(If the response is 3 or greater, seek elaboration: In what way did the knowledge of course content affect your choices? How did you gain this knowledge of course content?)

e.g. wanted to know more; required by major or minor

10b. Students might avoid taking classes on certain days or at certain times because of personal preferences or commitments. To what extent were the days of the week, or the time of the day, important in making your selection of courses to meet the natural science requirement?

5 4 3 2 1

___
44

For question 10, five represents that great importance was placed on the time of day or day of week in making selections and one represents that this factor was of no importance in making selections.

(If the response is 3 or greater, seek elaboration: In what way did the scheduling of courses affect your choices?)

e.g. avoided 8 o'clocks; had to work afternoons

11b. Students might select a particular course because of scheduling problems with other courses. Other courses may not have been offered that term or sections may have been full. Other courses might have been in conflict with required courses. To what extent were scheduling problems a factor in your selection of courses to meet the natural science requirement?

5 4 3 2 1

___
45

For question 11, five represents that scheduling problems were substantial factors in making selections and one represents that this factor was of no importance in making selections.

(If the response is 3 or greater, seek elaboration: Explain what courses you were unable to take, or what courses you were forced to take, because of the lack of course availability or scheduling conflict.)

e.g. desired course not offered or section full; conflict

12b. How beneficial to your general development were the contributions of courses in the natural sciences?

5 4 3 2 1 ___ 46

For question 12, five represents that natural science courses were very beneficial to your general development. One represents that natural sciences were not beneficial at all to your general development.

13b. How beneficial in understanding your major were the contributions of courses in the natural sciences?

5 4 3 2 1 ___ 47

For question 13, five represents that natural science courses made very valuable contributions to your understanding of your major. One represents that natural sciences were not beneficial at all in your major.

14b. The university is considering changes in the general education requirements. Do you think the number of credits required in the natural sciences should be increased or decreased?

5 4 3 2 1 ___ 48

For question 14, a response of five represents a substantial increase in credits should be required; a response of three means the number of credits required should remain unchanged; a one means the number of credits required should be substantially reduced

15. Do you wish to make any additional comments regarding the general education requirements?

Thank you for your participation in this survey

MACRAO EXPLANATION

The MACRAO Agreement is between Michigan Community Colleges and four-year universities.

The universities accept all the general education requirements as completed if a student has a MACRAO certified Associate of Arts or Associate of Science from a community college. It does't matter if the specific courses aren't the same at the two places.

[Other degrees like associate of applied science don't count.]

5. 5 — 4 — 3 — 2 — 1

great reliance on advice from faculty	No reliance on advice from faculty

6. 5 — 4 — 3 — 2 — 1

great reliance on advice from students	no reliance on advice from students

7. 5 — 4 — 3 — 2 — 1

great reliance on published information	no reliance on published information

8. 5 — 4 — 3 — 2 — 1

great reliance on reputation of instructor	no reliance or instructors reputation not known

9. 5 — 4 — 3 — 2 — 1

subject matter of great importance	no importance or subject matter not known

10.

5	4	3	2	1
great importance placed on time of day or days of week				time of day or days of week of no importance in making selection

11.

5	4	3	2	1
lack of availability or scheduling conflicts were substantial factors in selection				not a factor at all

12.

5	4	3	2	1
very beneficial in general development				not beneficial at all

13.

5	4	3	2	1
very beneficial in understanding major				not beneficial at all

14.

5	4	3	2	1
increased substantially		credits should remain about the same		reduced substantially

APPENDIX C

AUDIT OF STUDENT RECORDS

Document Audit

I.D. ___ ___ ___
1 2 3

Credits taken to meet the humanities requirement:

1. HU295-6-7 or other sequence ___ 49
2. philosophy ___ 50
3. music appreciation ___ 51
4. art appreciation ___ 52
5. second year foreign language ___ 53
6. literature ___ 54
7. western civilization ___ 55
8. film, drama, theater ___ 56
9. other ___ 57

Credits taken to meet the social science requirement:

1. economics ___ 58
2. history ___ 59

3. psychology ___ 60

4. sociology ___ 61

5. geography ___ 62

6. political science ___ 63

7. antropology ___ 64

8. social science sequence ___ 65

9. other ___ 66

Credits taken to meet the natural science requirement:

1. biology ___ 67

2. geology ___ 68

3. chemistry ___ 69

4. physics ___ 70

5. mathematics ___ 71

6. astronomy ___ 72

7. physical geography ___ 73

8. natural science sequence ___ 74

9. other ___ 75

Credit hours earned when humanities requirement met

____ 76

Credit hours earned when social science requirement met

____ 77

Credit hours earned when natural science requirement met

____ 78

Total credits earned in humanities

____ 79

Total credits earned in social sciences

____ 80

Total credits earned in natural sciences

____ 81

Transfer status

1. all credits earned at LSSU

2. MACRAO Agreement transfer ___ 82

3. transfer student without MACRAO

Transfer credits in designated general education courses

1. social sciences ___ 83

list courses/disciplines

2. humanities ___ 84

list courses/disciplines

3. natural sciences ___ 85

list courses/disciplines

APPENDIX D

CREDIT HOUR DISTRIBUTION IN SOCIAL SCIENCE DISCIPLINES

DESCRIPTIVES /VARIABLES SS.ECON SS.HIST SS.PY SS.SO SS.GEOG SS.PS SS.ANTHR

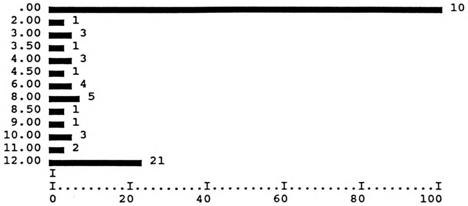
SS.SEQ SS.OTHER /STATISTICS 1 5.

Number of Valid Observations (Listwise) = 146.00

Variable	Mean	Std Dev	N	Label
SS.ECON	2.85	4.63	146	Social Sciences-Economics
SS.HIST	1.28	2.67	146	Social Sciences-History
SS.PY	3.00	3.44	146	Social Sciences-Psychology
SS.SO	2.74	3.32	146	Social Sciences-Sociology
SS.GEOG	.32	1.21	146	Social Sciences-Geography
SS.PS	1.60	2.50	146	Social Sciences-Political Science
SS.ANTHR	.05	.45	146	Social Sciences-Anthropology
SS.SEQ	.14	1.19	146	Social Science-Sequence
SS.OTHER	.03	.37	146	Social Science-Other

SS.ECON Social Sciences-Economics

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	100	68.5	68.5	68.5
	2.00	1	.7	.7	69.2
	3.00	3	2.1	2.1	71.2
	3.50	1	.7	.7	71.9
	4.00	3	2.1	2.1	74.0
	4.50	1	.7	.7	74.7
	6.00	4	2.7	2.7	77.4
	8.00	5	3.4	3.4	80.8
	8.50	1	.7	.7	81.5
	9.00	1	.7	.7	82.2
	10.00	3	2.1	2.1	84.2
	11.00	2	1.4	1.4	85.6
	12.00	21	14.4	14.4	100.0
	TOTAL	146	100.0	100.0	



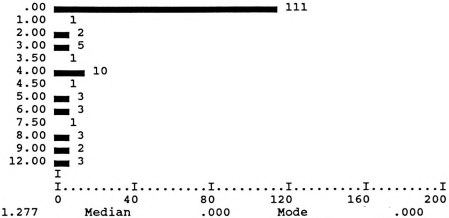
Mean	2.853	Median	.000	Mode	.000
Std Dev	4.629	Minimum	.000	Maximum	12.000

Valid Cases 146 Missing Cases 0

SS.HIST Social Sciences-History

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	111	76.0	76.0	76.0
	1.00	1	.7	.7	76.7
	2.00	2	1.4	1.4	78.1
	3.00	5	3.4	3.4	81.5
	3.50	1	.7	.7	82.2
	4.00	10	6.8	6.8	89.0
	4.50	1	.7	.7	89.7
	5.00	3	2.1	2.1	91.8
	6.00	3	2.1	2.1	93.8
	7.50	1	.7	.7	94.5
	8.00	3	2.1	2.1	96.6
	9.00	2	1.4	1.4	97.9
	12.00	3	2.1	2.1	100.0
	TOTAL	146	100.0	100.0	

SS.HIST Social Sciences-History



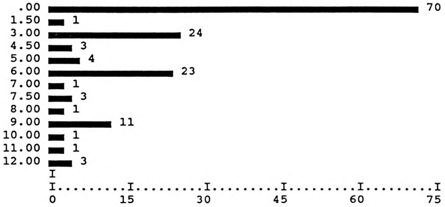
Mean	1.277	Median	.000	Mode	.000
Std Dev	2.670	Minimum	.000	Maximum	12.000

Valid Cases 146 Missing Cases 0

SS.PY Social Sciences-Psychology

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	70	47.9	47.9	47.9
	1.50	1	.7	.7	48.6
	3.00	24	16.4	16.4	65.1
	4.50	3	2.1	2.1	67.1
	5.00	4	2.7	2.7	69.9
	6.00	23	15.8	15.8	85.6
	7.00	1	.7	.7	86.3
	7.50	3	2.1	2.1	88.4
	8.00	1	.7	.7	89.0
	9.00	11	7.5	7.5	96.6
	10.00	1	.7	.7	97.3
	11.00	1	.7	.7	97.9
	12.00	3	2.1	2.1	100.0
	TOTAL	146	100.0	100.0	

SS.PY Social Sciences-Psychology



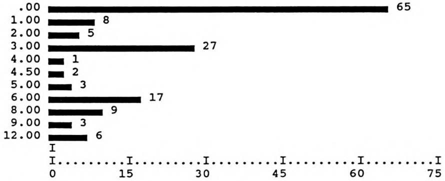
Mean	3.003	Median	3.000	Mode	.000
Std Dev	3.440	Minimum	.000	Maximum	12.000

Valid Cases 146 Missing Cases 0

SS.SO Social Sciences-Sociology

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	65	44.5	44.5	44.5
	1.00	8	5.5	5.5	50.0
	2.00	5	3.4	3.4	53.4
	3.00	27	18.5	18.5	71.9
	4.00	1	.7	.7	72.6
	4.50	2	1.4	1.4	74.0
	5.00	3	2.1	2.1	76.0
	6.00	17	11.6	11.6	87.7
	8.00	9	6.2	6.2	93.8
	9.00	3	2.1	2.1	95.9
	12.00	6	4.1	4.1	100.0
	TOTAL	146	100.0	100.0	

SS.SO Social Sciences-Sociology

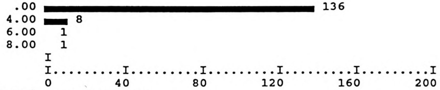


Mean	2.740	Median	1.500	Mode	.000
Std Dev	3.323	Minimum	.000	Maximum	12.000

Valid Cases 146 Missing Cases 0

SS.GEOG   Social Sciences-Geography

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	136	93.2	93.2	93.2
	4.00	8	5.5	5.5	98.6
	6.00	1	.7	.7	99.3
	8.00	1	.7	.7	100.0
	TOTAL	146	100.0	100.0	



SS.GEOG   Social Sciences-Geography

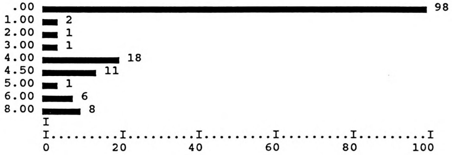
Mean	.315	Median	.000	Mode	.000
Std Dev	1.213	Minimum	.000	Maximum	8.000

Valid Cases   146   Missing Cases   0

SS.PS Social Sciences-Political Science

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	98	67.1	67.1	67.1
	1.00	2	1.4	1.4	68.5
	2.00	1	.7	.7	69.2
	3.00	1	.7	.7	69.9
	4.00	18	12.3	12.3	82.2
	4.50	11	7.5	7.5	89.7
	5.00	1	.7	.7	90.4
	6.00	6	4.1	4.1	94.5
	8.00	8	5.5	5.5	100.0
	TOTAL	146	100.0	100.0	

SS.PS Social Sciences-Political Science

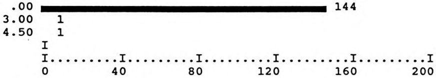


Mean	1.599	Median	.000	Mode	.000
Std Dev	2.499	Minimum	.000	Maximum	8.000

Valid Cases 146 Missing Cases 0

SS.ANTHR Social Sciences-Anthropology

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	144	98.6	98.6	98.6
	3.00	1	.7	.7	99.3
	4.50	1	.7	.7	100.0
	TOTAL	146	100.0	100.0	



Mean	.051	Median	.000	Mode	.000
Std Dev	.446	Minimum	.000	Maximum	4.500

Valid Cases 146   Missing Cases 0

SS.SEQ Social Science-Sequence

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	144	98.6	98.6	98.6
	8.00	1	.7	.7	99.3
	12.00	1	.7	.7	100.0
	TOTAL	146	100.0	100.0	

```
  .00 ████████████████████████████████████ 144
 8.00  1
12.00  1
     I
     I.........I.........I.........I.........I.........I
     0        40        80       120       160       200
```

Mean	.137	Median	.000	Mode	.000
Std Dev	1.190	Minimum	.000	Maximum	12.000

Valid Cases 146 Missing Cases 0

SS.OTHER Social Science-Other

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	145	99.3	99.3	99.3
	4.50	1	.7	.7	100.0
	TOTAL	146	100.0	100.0	

```
  .00 ████████████████████████████████████ 145
 4.50  1
     I
     I.........I.........I.........I.........I.........I
     0        40        80       120       160       200
```

Mean	.031	Median	.000	Mode	.000
Std Dev	.372	Minimum	.000	Maximum	4.500

Valid Cases 146 Missing Cases 0

APPENDIX E

CREDIT HOUR DISTRIBUTION IN NATURAL SCIENCE DISCIPLINES

DESCRIPTIVES /VARIABLES NS.BIO TO NS.OTHER /STATISTICS 1 5.

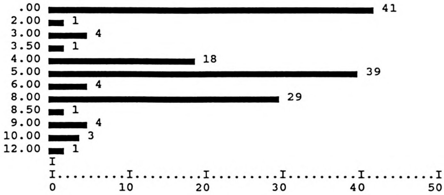
Number of Valid Observations (Listwise) = 146.00

Variable	Mean	Std Dev	N	Label
NS.BIO	4.29	3.18	146	Natural Science-Biology
NS.GEO	.15	.94	146	Natural Science-Geology
NS.CHEM	1.11	1.91	146	Natural Science-Chemistry
NS.PHYS	1.01	2.43	146	Natural Science-Physics
NS.MATH	.12	.85	146	Natural Science-Math
NS.ASTRO	.00	.00	146	Natural Science-Astronomy
NS.PGEOG	.23	.90	146	Natural Science-Physical Geography
NS.SEQ	4.96	4.07	146	Natural Science-Sequence
NS.OTHER	.05	.66	146	Natural Science-Other

NS.BIO Natural Science-Biology

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	41	28.1	28.1	28.1
	2.00	1	.7	.7	28.8
	3.00	4	2.7	2.7	31.5
	3.50	1	.7	.7	32.2
	4.00	18	12.3	12.3	44.5
	5.00	39	26.7	26.7	71.2
	6.00	4	2.7	2.7	74.0
	8.00	29	19.9	19.9	93.8
	8.50	1	.7	.7	94.5
	9.00	4	2.7	2.7	97.3
	10.00	3	2.1	2.1	99.3
	12.00	1	.7	.7	100.0
	TOTAL	146	100.0	100.0	

NS.BIO Natural Science-Biology

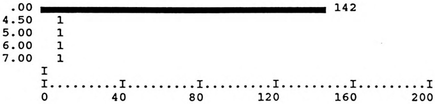


Mean	4.295	Median	5.000	Mode	.000
Std Dev	3.176	Minimum	.000	Maximum	12.000

Valid Cases 146 Missing Cases 0

NS.GEO   Natural Science-Geology

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	142	97.3	97.3	97.3
	4.50	1	.7	.7	97.9
	5.00	1	.7	.7	98.6
	6.00	1	.7	.7	99.3
	7.00	1	.7	.7	100.0
	TOTAL	146	100.0	100.0	



Mean	.154	Median	.000	Mode	.000
Std Dev	.935	Minimum	.000	Maximum	7.000

Valid Cases 146   Missing Cases 0

NS.CHEM   Natural Science-Chemistry

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	106	72.6	72.6	72.6
	1.00	1	.7	.7	73.3
	2.00	1	.7	.7	74.0
	3.00	3	2.1	2.1	76.0
	4.00	31	21.2	21.2	97.3
	5.00	1	.7	.7	97.9
	6.00	2	1.4	1.4	99.3
	9.00	1	.7	.7	100.0
	TOTAL	146	100.0	100.0	

NS.CHEM   Natural Science-Chemistry

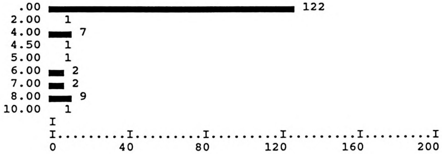
Mean	1.110	Median	.000	Mode	.000
Std Dev	1.905	Minimum	.000	Maximum	9.000

Valid Cases 146   Missing Cases 0

NS.PHYS Natural Science-Physics

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	122	83.6	83.6	83.6
	2.00	1	.7	.7	84.2
	4.00	7	4.8	4.8	89.0
	4.50	1	.7	.7	89.7
	5.00	1	.7	.7	90.4
	6.00	2	1.4	1.4	91.8
	7.00	2	1.4	1.4	93.2
	8.00	9	6.2	6.2	99.3
	10.00	1	.7	.7	100.0
	TOTAL	146	100.0	100.0	

NS.PHYS Natural Science-Physics

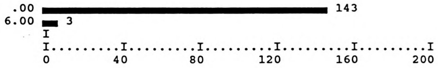


Mean	1.010	Median	.000	Mode	.000
Std Dev	2.433	Minimum	.000	Maximum	10.000

Valid Cases 146 Missing Cases 0

NS.MATH Natural Science-Math

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	143	97.9	97.9	97.9
	6.00	3	2.1	2.1	100.0
	TOTAL	146	100.0	100.0	

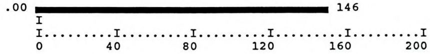


Mean	.123	Median	.000	Mode	.000
Std Dev	.854	Minimum	.000	Maximum	6.000

Valid Cases 146 Missing Cases 0

NS.ASTRO Natural Science-Astronomy

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	146	100.0	100.0	100.0
	TOTAL	146	100.0	100.0	

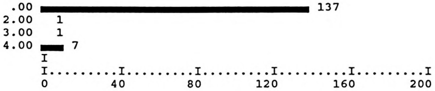


Mean	.000	Median	.000	Mode	.000
Std Dev	.000	Minimum	.000	Maximum	.000

Valid Cases 146 Missing Cases 0

NS.PGEOG Natural Science-Physical Geography

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	137	93.8	93.8	93.8
	2.00	1	.7	.7	94.5
	3.00	1	.7	.7	95.2
	4.00	7	4.8	4.8	100.0
	TOTAL	146	100.0	100.0	



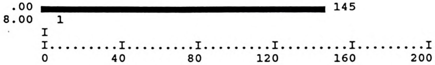
NS.PGEOG Natural Science-Physical Geography

Mean	.226	Median	.000	Mode	.000
Std Dev	.900	Minimum	.000	Maximum	4.000

Valid Cases 146 Missing Cases 0

NS.OTHER Natural Science-Other

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	145	99.3	99.3	99.3
	8.00	1	.7	.7	100.0
	TOTAL	146	100.0	100.0	



Mean	.055	Median	.000	Mode	.000
Std Dev	.662	Minimum	.000	Maximum	8.000

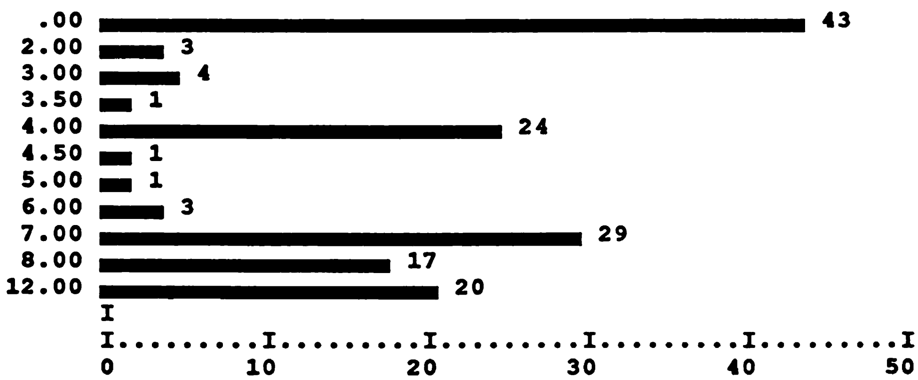
Valid Cases 146 Missing Cases 0

NS.SEQ   Natural Science-Sequence

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	43	29.5	29.5	29.5
	2.00	3	2.1	2.1	31.5
	3.00	4	2.7	2.7	34.2
	3.50	1	.7	.7	34.9
	4.00	24	16.4	16.4	51.4
	4.50	1	.7	.7	52.1
	5.00	1	.7	.7	52.7
	6.00	3	2.1	2.1	54.8
	7.00	29	19.9	19.9	74.7
	8.00	17	11.6	11.6	86.3
	12.00	20	13.7	13.7	100.0
	TOTAL	146	100.0	100.0	

MORE

NS.SEQ   Natural Science-Sequence



Mean	4.959	Median	4.000	Mode	.000
Std Dev	4.065	Minimum	.000	Maximum	12.000

Valid Cases   146   Missing Cases   0

APPENDIX F

ANALYSIS OF VARIANCE TEST DATA

2. What was the mean number of credits earned in humanities, social science, and natural science by degree area of students, and were differences significant?

```
MANOVA TOTHU TOTSS TOTNS BY MAJAREA (1,5) /WSFACTORS Content (3).

 - - - - - - - - - -

NOTE    12167
The last subcommand is not a design specification--A full factorial model
is generated for this problem.

       146 cases accepted.
         0 cases rejected because of out-of-range factor values.
         0 cases rejected because of missing data.
         5 non-empty cells.

         1 design will be processed.

                                                                   MORE

* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests of Between-Subjects Effects.

 Tests of Significance for T1 using UNIQUE sums of squares
 Source of Variation          SS      DF        MS          F  Sig of F

 WITHIN CELLS           33408.45     141    236.94
 CONSTANT              301193.17       1 301193.17   1271.18      .000
 MAJAREA                25653.85       4   6413.46     27.07      .000

 - - - - - - - - - -



* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests involving 'CONTENT' Within-Subject Effect.

 AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares
 Source of Variation          SS      DF        MS          F  Sig of F

 WITHIN CELLS           99127.78     282    351.52
 CONTENT                56689.00       2  28344.50     80.63      .000
 MAJAREA BY CONTENT     84554.36       8  10569.29     30.07      .000
```

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Variable TOTHU Total Humanities credits

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	36.6407	9.1602	2.2154	.0703
Within Groups	141	582.9980	4.1347		
Total	145	619.6387			

MORE

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Variable TOTSS Total Social Sciences credits

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	74383.0933	18595.7733	50.8151	.0000
Within Groups	141	51598.8673	365.9494		
Total	145	125981.9606			

(*) Denotes pairs of groups significantly different at the .050 level

Mean	Group	4	1	3	5	2
15.1923	Grp 4					
30.3654	Grp 1	*				
31.9744	Grp 3	*				
46.4375	Grp 5	*	*	*		
81.2742	Grp 2	*	*	*	*	

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable TOTNS Total Natural Science credits

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	35788.4746	8947.1186	15.6998	.0000
Within Groups	141	80354.3679	569.8891		
Total	145	116142.8425			

(*) Denotes pairs of groups significantly different at the .050 level

Mean	Group	2	3	5	4	1
15.7097	Grp 2					
15.9359	Grp 3					
17.2083	Grp 5					
23.3269	Grp 4					
58.0385	Grp 1	*	*	*	*	

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable TOTTOT

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	76961.5558	19240.3890	27.0679	.0000
Within Groups	141	100225.3620	710.8182		
Total	145	177186.9178			

(*) Denotes pairs of groups significantly different at the .050 level

Mean	Group	4	3	5	1	2
50.9423	Grp 4					
60.9103	Grp 3					
75.9375	Grp 5	*				
100.9038	Grp 1	*	*	*		
110.6452	Grp 2	*	*	*		

3. What was the mean number of credits earned in humanities, social science, and natural science by gender of students, and were differences significant?

```
MANOVA TOTHU TOTSS TOTNS BY GENDER (1,2) /WSFACTORS Content (3).

 - - - - - - - - - -

NOTE    12167
The last subcommand is not a design specification--A full factorial model
is generated for this problem.

       146 cases accepted.
         0 cases rejected because of out-of-range factor values.
         0 cases rejected because of missing data.
         2 non-empty cells.

         1 design will be processed.

                                                              MORE

* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests of Between-Subjects Effects.

 Tests of Significance for T1 using UNIQUE sums of squares
 Source of Variation          SS      DF        MS          F  Sig of F

 WITHIN CELLS           58266.70     144    404.63
 CONSTANT              304452.63       1 304452.63     752.42      .000
 GENDER                   795.61       1    795.61       1.97      .163

* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests involving 'CONTENT' Within-Subject Effect.

 AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares
 Source of Variation          SS      DF        MS          F  Sig of F

 WITHIN CELLS          181714.74     288    630.95
 CONTENT                62273.44       2  31136.72      49.35      .000
 GENDER BY CONTENT       1967.40       2    983.70       1.56      .212

 - - - - - - - - - -
```

4. What was the mean number of credits earned in humanities, social science, and natural science by transfer/nontransfer status of students, and were differences significant?

```
MANOVA TOTHU TOTSS TOTNS BY TRANTRAN (1,3) /WSFACTORS CONTENT (3).

 - - - - - - - - - -

NOTE    12167
The last subcommand is not a design specification--A full factorial model
is generated for this problem.

       146 cases accepted.
         0 cases rejected because of out-of-range factor values.
         0 cases rejected because of missing data.
         3 non-empty cells.

         1 design will be processed.

                                                                    MORE

* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests of Between-Subjects Effects.

 Tests of Significance for T1 using UNIQUE sums of squares
 Source of Variation          SS      DF        MS         F  Sig of F

 WITHIN CELLS           58372.36     143    408.20
 CONSTANT              109581.10       1 109581.10    268.45      .000
 TRANTRAN                 689.94       2    344.97       .85      .432

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* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests involving 'CONTENT' Within-Subject Effect.

 AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares
 Source of Variation          SS      DF        MS         F  Sig of F

 WITHIN CELLS          181397.80     286    634.26
 CONTENT                28972.35       2  14486.17     22.84      .000
 TRANTRAN BY CONTENT     2284.34       4    571.08       .90      .464

 - - - - - - - - - -
```

5. What was the mean number of credits earned in humanities, social science, and natural science by traditional/nontraditional age status of students, and were differences significant?

```
MANOVA TOTHU TOTSS TOTNS BY age (1,2) /WSFACTORS Content (3).

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NOTE    12167
The last subcommand is not a design specification--A full factorial model
is generated for this problem.

       146 cases accepted.
         0 cases rejected because of out-of-range factor values.
         0 cases rejected because of missing data.
         2 non-empty cells.

         1 design will be processed.

                                                                  MORE

* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests of Between-Subjects Effects.

 Tests of Significance for T1 using UNIQUE sums of squares
 Source of Variation          SS      DF        MS          F  Sig of F

 WITHIN CELLS           58861.83     144    408.76
 CONSTANT              280277.69       1 280277.69     685.67      .000
 AGE                      200.48       1    200.48        .49      .485

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* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests involving 'CONTENT' Within-Subject Effect.

 AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares
 Source of Variation          SS      DF        MS          F  Sig of F

 WITHIN CELLS          183629.45     288    637.60
 CONTENT                55366.08       2  27683.04      43.42      .000
 AGE BY CONTENT            52.69       2     26.34        .04      .960

 - - - - - - - - - -
```

6. What was the mean number of credits earned in humanities, social science, and natural science by students based on the country in which secondary education was received, and were differences significant?

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	59061.63	144	410.15		
CONSTANT	253932.75	1	253932.75	619.12	.000
HSEDUCAT	.68	1	.68	.00	.968

\- - - - - - - - - - -

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	183642.07	288	637.65		
CONTENT	50907.54	2	25453.77	39.92	.000
HSEDUCAT BY CONTENT	40.07	2	20.03	.03	.969

\- - - - - - - - - - -

7. What was the mean number of credits earned by degree area of students when the humanities, social science, and natural science requirements were met, and were differences significant?

```
     146 cases accepted.
       0 cases rejected because of out-of-range factor values.
       0 cases rejected because of missing data.
       5 non-empty cells.

       1 design will be processed.
```

Cell Means and Standard Deviations

Variable .. CRHUMET   Credit hours earned when HU requirement

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	137.923	51.010	26
MAJAREA	Social S	139.210	52.215	31
MAJAREA	Business	148.667	52.639	39
MAJAREA	Math./Te	173.308	35.833	26
MAJAREA	Criminal	141.938	41.717	24
For entire sample		148.027	48.909	146

- - - - - - - - - -

Variable .. CRSSMET   Credit Hours earned when SS requirement

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	153.192	53.240	26
MAJAREA	Social S	69.274	39.093	31
MAJAREA	Business	162.662	49.792	39
MAJAREA	Math./Te	132.231	60.024	26
MAJAREA	Criminal	72.125	39.649	24
For entire sample		120.845	62.991	146

Variable .. CRNSMET   Credit hours earned when NS requirement

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	91.346	58.900	26
MAJAREA	Social S	151.597	44.791	31
MAJAREA	Business	161.649	54.437	39
MAJAREA	Math./Te	156.846	47.090	26
MAJAREA	Criminal	138.292	46.003	24
For entire sample		142.300	55.975	146

- - - - - - - - - -

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	558649.99	141	3962.06		
CONSTANT	7785095.15	1	7785095.2	1964.91	.000
MAJAREA	134181.90	4	33545.47	8.47	.000

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* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	466405.28	282	1653.92		
CONTENT	69563.84	2	34781.92	21.03	.000
MAJAREA BY CONTENT	217261.07	8	27157.63	16.42	.000

- - - - - - - - - - -

8. What was the mean number of credits earned by transfer/nontransfer status of students when the humanities, social science, and natural science requirements were met, and were differences significant?

146 cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
2 non-empty cells.

1 design will be processed.

Cell Means and Standard Deviations
Variable .. CRHUMET Credit hours earned when HU requirement

FACTOR	CODE	Mean	Std. Dev.	N
TRTR	1	124.441	37.394	59
TRTR	2	164.023	49.493	87
For entire sample		148.027	48.909	146

MORE

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Cell Means and Standard Deviations (CONT.)
Variable .. CRSSMET Credit Hours earned when SS requirement

FACTOR	CODE	Mean	Std. Dev.	N
TRTR	1	103.000	53.692	59
TRTR	2	132.946	66.175	87
For entire sample		120.845	62.991	146

- - - - - - - - - -

Variable .. CRNSMET Credit hours earned when NS requirement

FACTOR	CODE	Mean	Std. Dev.	N
TRTR	1	121.593	49.851	59
TRTR	2	156.343	55.794	87
For entire sample		142.300	55.975	146

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	565399.69	144	3926.39		
CONSTANT	7544316.15	1	7544316.1	1921.44	.000
TRTR	127432.20	1	127432.20	32.46	.000

- - - - - - - - - -

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	682034.00	288	2368.17		
CONTENT	54284.24	2	27142.12	11.46	.000
TRTR BY CONTENT	1632.35	2	816.18	.34	.709

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6424 BYTES OF WORKSPACE NEEDED FOR MANOVA EXECUTION.

9. What was the mean number of credits earned by students based on the country in which the secondary education was received when the humanities, social science, and natural science requirements were met, and were differences significant?

```
146 cases accepted.
  0 cases rejected because of out-of-range factor values.
  0 cases rejected because of missing data.
  2 non-empty cells.

  1 design will be processed.
Cell Means and Standard Deviations
Variable .. CRHUMET              Credit hours earned when HU requirement
     FACTOR            CODE                      Mean  Std. Dev.          N

 HSEDUCAT         U.S.                        142.228     47.160        103
 HSEDUCAT         Non-U.S.                    161.919     50.764         43
For entire sample                             148.027     48.909        146

Cell Means and Standard Deviations  (CONT.)
Variable .. CRSSMET              Credit Hours earned when SS requirement
     FACTOR            CODE                      Mean  Std. Dev.          N

 HSEDUCAT         U.S.                        113.985     58.298        103
 HSEDUCAT         Non-U.S.                    137.274     71.084         43
For entire sample                             120.845     62.991        146

- - - - - - - - - -
Variable .. CRNSMET              Credit hours earned when NS requirement
     FACTOR            CODE                      Mean  Std. Dev.          N

 HSEDUCAT         U.S.                        139.335     50.633        103
 HSEDUCAT         Non-U.S.                    149.402     67.212         43
For entire sample                             142.300     55.975        146


* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests of Between-Subjects Effects.

 Tests of Significance for T1 using UNIQUE sums of squares


Source of Variation          SS       DF        MS          F  Sig of F

WITHIN CELLS          664377.45      144   4613.73
CONSTANT             7205506.84        1 7205506.8    1561.75      .000
HSEDUCAT               28454.44        1  28454.44       6.17      .014

- - - - - - - - - -
```

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	680831.35	288	2364.00		
CONTENT	44886.94	2	22443.47	9.49	.000
HSEDUCAT BY CONTENT	2835.00	2	1417.50	.60	.550

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10. What was the mean number of credits earned by gender of students when the humanities, social science, and natural science requirements were met, and were differences significant?

```
146 cases accepted.
  0 cases rejected because of out-of-range factor values.
  0 cases rejected because of missing data.
  2 non-empty cells.

  1 design will be processed.
Cell Means and Standard Deviations
Variable .. CRHUMET          Credit hours earned when HU requirement
     FACTOR            CODE                   Mean  Std. Dev.         N

 GENDER          Male                      152.217     46.765        83
 GENDER          Female                    142.508     51.454        63
For entire sample                          148.027     48.909       146
                                                                    MORE

Cell Means and Standard Deviations  (CONT.)
Variable .. CRSSMET          Credit Hours earned when SS requirement
     FACTOR            CODE                   Mean  Std. Dev.         N

 GENDER          Male                      121.293     66.123        83
 GENDER          Female                    120.254     59.130        63
For entire sample                          120.845     62.991       146

- - - - - - - - - - -
Variable .. CRNSMET          Credit hours earned when NS requirement
     FACTOR            CODE                   Mean  Std. Dev.         N

 GENDER          Male                      148.257     54.897        83
 GENDER          Female                    134.452     56.848        63
For entire sample                          142.300     55.975       146


* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests of Between-Subjects Effects.

 Tests of Significance for T1 using UNIQUE sums of squares


 Source of Variation           SS      DF        MS          F  Sig of F

 WITHIN CELLS           685635.45     144   4761.36
 CONSTANT              8007403.39       1 8007403.4    1681.75      .000
 GENDER                   7196.44       1   7196.44       1.51      .221

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Tests involving 'CONTENT' Within-Subject Effect.

 AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares
 Source of Variation           SS      DF        MS          F  Sig of F

 WITHIN CELLS           680623.27     288   2363.28
 CONTENT                 55711.75       2  27855.88      11.79      .000
 GENDER BY CONTENT        3043.08       2   1521.54        .64      .526

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```

11. What was the mean number of credits earned by age of students when the humanities, social science, and natural science requirements were met, and were differences significant?

```
146 cases accepted.
  0 cases rejected because of out-of-range factor values.
  0 cases rejected because of missing data.
  2 non-empty cells.

  1 design will be processed.
```

Cell Means and Standard Deviations

Variable .. CRHUMET — Credit hours earned when HU requirement

FACTOR	CODE	Mean	Std. Dev.	N
AGE	25+	161.300	57.806	50
AGE	25-	141.115	42.267	96
For entire sample		148.027	48.909	146

Cell Means and Standard Deviations (CONT.)

Variable .. CRSSMET — Credit Hours earned when SS requirement

FACTOR	CODE	Mean	Std. Dev.	N
AGE	25+	119.606	72.582	50
AGE	25-	121.490	57.773	96
For entire sample		120.845	62.991	146

- - - - - - - - - -

Variable .. CRNSMET — Credit hours earned when NS requirement

FACTOR	CODE	Mean	Std. Dev.	N
AGE	25+	146.146	65.299	50
AGE	25-	140.297	50.706	96
For entire sample		142.300	55.975	146

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	686439.90	144	4766.94		
CONSTANT	7548734.80	1	7548734.8	1583.56	.000
AGE	6391.99	1	6391.99	1.34	.249

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MORE

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	675421.26	288	2345.21		
CONTENT	66536.90	2	33268.45	14.19	.000
AGE BY CONTENT	8245.09	2	4122.55	1.76	.174

\- - - - - - - - - -

12. How important was the advice of LSSU faculty advisors or other faculty or staff members to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

```
MANOVA FACADVHU FACADVSS FACADVNS BY MAJAREA (1,5) /WSFACTORS content
(3) /OMEANS
/DESIGN.

        103 cases accepted.
          0 cases rejected because of out-of-range factor values.
          1 cases rejected because of missing data.
          5 non-empty cells.

          1 design will be processed.
```

- - - - - - - - - -

Cell Means and Standard Deviations
Variable .. FACADVHU

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	2.211	1.182	19
MAJAREA	Social S	2.000	1.243	23
MAJAREA	Business	1.759	1.057	29
MAJAREA	Math./Te	1.588	1.121	17
MAJAREA	Criminal	1.867	1.125	15
For entire sample		1.883	1.140	103

MORE

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Cell Means and Standard Deviations (CONT.)
Variable .. FACADVSS

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	2.263	1.195	19
MAJAREA	Social S	2.826	1.586	23
MAJAREA	Business	2.103	1.205	29
MAJAREA	Math./Te	2.412	1.372	17
MAJAREA	Criminal	2.467	1.187	15
For entire sample		2.398	1.324	103

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Variable .. FACADVNS

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	3.000	1.528	19
MAJAREA	Social S	2.348	1.265	23
MAJAREA	Business	2.345	1.261	29
MAJAREA	Math./Te	2.588	1.502	17
MAJAREA	Criminal	2.333	1.175	15
For entire sample		2.505	1.342	103

MORE

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Cell Means and Standard Deviations (CONT.)
Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	264.08	98	2.69		
CONSTANT	1514.42	1	1514.42	561.99	.000
MAJAREA	7.68	4	1.92	.71	.585

\- - - - - - - - - -

MORE

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	212.98	196	1.09		
CONTENT	22.75	2	11.38	10.47	.000
MAJAREA BY CONTENT	10.28	8	1.28	1.18	.312

\- - - - - - - - - -

13. How important was the advice of students or former students to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

```
MANOVA STUADVHU STUADVSS STUADVNS BY MAJAREA (1,5) /WSFACTORS content
(3) /OMEANS
/DESIGN.

       103 cases accepted.
         0 cases rejected because of out-of-range factor values.
         1 cases rejected because of missing data.
         5 non-empty cells.

         1 design will be processed.
```

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Cell Means and Standard Deviations
Variable .. STUADVHU

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	2.895	1.286	19
MAJAREA	Social S	2.783	1.622	23
MAJAREA	Business	3.069	1.412	29
MAJAREA	Math./Te	2.824	1.425	17
MAJAREA	Criminal	3.333	1.447	15
For entire sample		2.971	1.431	103

MORE

Cell Means and Standard Deviations (CONT.)
Variable .. STUADVSS

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	3.421	1.071	19
MAJAREA	Social S	3.174	1.337	23
MAJAREA	Business	3.207	1.373	29
MAJAREA	Math./Te	2.706	1.263	17
MAJAREA	Criminal	3.600	1.056	15
For entire sample		3.214	1.258	103

- - - - - - - - - -

Variable .. STUADVNS

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	2.789	1.437	19
MAJAREA	Social S	3.174	1.193	23
MAJAREA	Business	3.034	1.401	29
MAJAREA	Math./Te	2.765	1.522	17
MAJAREA	Criminal	3.333	.900	15
For entire sample		3.019	1.313	103

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Cell Means and Standard Deviations (CONT.)
Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	360.36	98	3.68		
CONSTANT	2767.13	1	2767.13	752.53	.000
MAJAREA	10.55	4	2.64	.72	.582

\- - - - - - - - - - -

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	170.66	196	.87		
CONTENT	3.27	2	1.63	1.88	.156
MAJAREA BY CONTENT	4.61	8	.58	.66	.724

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7672 BYTES OF WORKSPACE NEEDED FOR MANOVA EXECUTION.

14. How important were publications of the university in assisting students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

```
Manova PRINTHU PRINTSS PRINTNS BY MAJAREA (1,5) /WSFACTORS Content (3) /OMEANS
 /DESIGN.

       103 cases accepted.
         0 cases rejected because of out-of-range factor values.
         1 cases rejected because of missing data.
         5 non-empty cells.

         1 design will be processed.
```

- - - - - - - - - -

Cell Means and Standard Deviations
Variable .. PRINTHU

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	3.000	1.414	19
MAJAREA	Social S	2.913	1.443	23
MAJAREA	Business	2.828	1.466	29
MAJAREA	Math./Te	2.412	1.417	17
MAJAREA	Criminal	2.467	1.302	15
For entire sample		2.757	1.411	103

Cell Means and Standard Deviations (CONT.)
Variable .. PRINTSS

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	3.368	1.257	19
MAJAREA	Social S	3.261	1.096	23
MAJAREA	Business	3.000	1.282	29
MAJAREA	Math./Te	2.647	1.412	17
MAJAREA	Criminal	3.000	1.363	15
For entire sample		3.068	1.270	103

- - - - - - - - - -

Variable .. PRINTNS

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	3.632	1.461	19
MAJAREA	Social S	3.087	.900	23
MAJAREA	Business	3.207	1.177	29
MAJAREA	Math./Te	2.176	1.237	17
MAJAREA	Criminal	2.733	1.387	15
For entire sample		3.019	1.283	103

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Cell Means and Standard Deviations (CONT.)
Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	358.95	98	3.66		
CONSTANT	2489.26	1	2489.26	679.61	.000
MAJAREA	26.89	4	6.72	1.84	.128

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* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	144.01	196	.73		
CONTENT	5.75	2	2.88	3.92	.022
MAJAREA BY CONTENT	5.57	8	.70	.95	.479

\- - - - - - - - - - -

Information Sources

Research Questions 12, 13, and 14 all dealt with information sources that might be used in course selection. A summated scale was constructed, using responses for all three questions. Mean responses for the summated scale were tested for differences based on disciplinary major groups.

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	1194.32	98	12.19		
CONSTANT	19997.21	1	19997.21	1640.88	.000
MAJAREA	66.41	4	16.60	1.36	.253

- - - - - - - - - -

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	561.26	196	2.86		
CONTENT	68.11	2	34.06	11.89	.000
MAJAREA BY CONTENT	12.46	8	1.56	.54	.822

- - - - - - - - - -

```
      103 cases accepted.
        0 cases rejected because of out-of-range factor values.
       43 cases rejected because of missing data.
        5 non-empty cells.

        1 design will be processed.
```

Cell Means and Standard Deviations
Variable .. FSPHUSUB

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	8.105	2.401	19
MAJAREA	Social S	7.696	3.066	23
MAJAREA	Business	7.655	2.511	29
MAJAREA	Math./Te	6.824	2.378	17
MAJAREA	Criminal	7.667	2.469	15
For entire sample		7.612	2.579	103

- - - - - - - - - - -

Variable .. FSPSSSUB

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	9.053	1.985	19
MAJAREA	Social S	9.261	2.848	23
MAJAREA	Business	8.310	2.392	29
MAJAREA	Math./Te	7.765	2.306	17
MAJAREA	Criminal	9.067	1.870	15
For entire sample		8.680	2.373	103

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Cell Means and Standard Deviations (CONT.)
Variable .. FSPNSSUB

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	9.421	2.735	19
MAJAREA	Social S	8.609	2.350	23
MAJAREA	Business	8.586	2.228	29
MAJAREA	Math./Te	7.529	2.267	17
MAJAREA	Criminal	8.400	2.261	15
For entire sample		8.544	2.388	103

- - - - - - - - - - -

15. How important was the reputation of the classroom instructor to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

```
Manova REPUTHU REPUTASS REPUTANS BY MAJAREA (1,5) /WSFACTORS Content (3) /OMEANS

/DESIGN.

      103 cases accepted.
        0 cases rejected because of out-of-range factor values.
        1 cases rejected because of missing data.
        5 non-empty cells.

        1 design will be processed.
```

- - - - - - - - - - -

Cell Means and Standard Deviations

Variable .. REPUTHU

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	3.895	1.410	19
MAJAREA	Social S	3.826	.984	23
MAJAREA	Business	4.000	1.165	29
MAJAREA	Math./Te	3.000	1.541	17
MAJAREA	Criminal	4.000	1.134	15
For entire sample		3.777	1.267	103

Variable .. REPUTASS

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	3.316	1.376	19
MAJAREA	Social S	3.348	1.191	23
MAJAREA	Business	3.414	1.402	29
MAJAREA	Math./Te	2.647	1.367	17
MAJAREA	Criminal	3.933	.799	15
For entire sample		3.330	1.301	103

- - - - - - - - - - -

Variable .. REPUTANS

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	2.632	1.499	19
MAJAREA	Social S	2.957	1.492	23
MAJAREA	Business	2.724	1.601	29
MAJAREA	Math./Te	2.529	1.546	17
MAJAREA	Criminal	3.867	1.356	15
For entire sample		2.893	1.546	103

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Cell Means and Standard Deviations (CONT.)
Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	303.82	98	3.10		
CONSTANT	3265.48	1	3265.48	1053.32	.000
MAJAREA	35.52	4	8.88	2.86	.027

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Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	231.59	196	1.18		
CONTENT	31.44	2	15.72	13.31	.000
MAJAREA BY CONTENT	9.54	8	1.19	1.01	.430

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16. How important was the content of the course or subject matter to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

```
TABLES (Majarea) /DESIGN.

       103 cases accepted.
         0 cases rejected because of out-of-range factor values.
         1 cases rejected because of missing data.
         5 non-empty cells.

         1 design will be processed.

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                                                                  MORE

* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

 Combined Observed Means for MAJAREA
 Variable .. CONTENHU
        MAJAREA
      Life Sci         WGT.      2.15789
                     UNWGT.      2.15789
      Social S         WGT.      2.39130
                     UNWGT.      2.39130
      Business         WGT.      2.37931
                     UNWGT.      2.37931
      Math./Te         WGT.      1.88235
                     UNWGT.      1.88235
      Criminal         WGT.      2.46667
                     UNWGT.      2.46667

* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

 Variable .. CONTENSS
        MAJAREA
      Life Sci         WGT.      3.05263
                     UNWGT.      3.05263
      Social S         WGT.      3.47826
                     UNWGT.      3.47826
      Business         WGT.      2.72414
                     UNWGT.      2.72414
      Math./Te         WGT.      3.00000
                     UNWGT.      3.00000
      Criminal         WGT.      3.26667
                     UNWGT.      3.26667
```

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Variable .. CONTENNS

MAJAREA		
Life Sci	WGT.	3.15789
	UNWGT.	3.15789
Social S	WGT.	2.86957
	UNWGT.	2.86957
Business	WGT.	2.58621
	UNWGT.	2.58621
Math./Te	WGT.	2.58824
	UNWGT.	2.58824
Criminal	WGT.	2.40000
	UNWGT.	2.40000

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	279.01	98	2.85		
CONSTANT	2124.64	1	2124.64	746.26	.000
MAJAREA	7.45	4	1.86	.65	.625

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AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	264.62	196	1.35		
CONTENT	35.28	2	17.64	13.06	.000
MAJAREA BY CONTENT	11.08	8	1.38	1.03	.418

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Course-Related Factors

The responses to Research Questions 15 and 16, related to reputation of the instructor and course content, respectively, were combined to obtain a summated scale, which was then subjected to ANOVA. The summated scale represents information related to the particular course and section (instructor), which affects selection of the course to meet the distributional requirement.

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	631.57	98	6.44		
CONSTANT	10658.13	1	10658.13	1653.80	.000
MAJAREA	56.22	4	14.05	2.18	.077

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Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	522.44	196	2.67		
CONTENT	29.39	2	14.69	5.51	.005
MAJAREA BY CONTENT	13.64	8	1.70	.64	.744

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103 cases accepted.
0 cases rejected because of out-of-range factor values.
43 cases rejected because of missing data.
5 non-empty cells.

1 design will be processed.

Cell Means and Standard Deviations

Variable .. RCHUSUB

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	6.053	1.957	19
MAJAREA	Social S	6.217	1.204	23
MAJAREA	Business	6.379	1.879	29
MAJAREA	Math./Te	4.882	1.536	17
MAJAREA	Criminal	6.467	1.995	15
For entire sample		6.049	1.779	103

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Variable .. RCSSSUB

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	6.368	2.033	19
MAJAREA	Social S	6.826	1.875	23
MAJAREA	Business	6.138	2.048	29
MAJAREA	Math./Te	5.647	2.234	17
MAJAREA	Criminal	7.200	1.373	15
For entire sample		6.408	1.982	103

Variable .. RCNSSUB

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	5.789	2.371	19
MAJAREA	Social S	5.826	2.081	23
MAJAREA	Business	5.310	2.222	29
MAJAREA	Math./Te	5.118	2.522	17
MAJAREA	Criminal	6.267	1.870	15
For entire sample		5.621	2.215	103

17. How important was the day of the week or hour of the day the course was scheduled to students in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

```
Manova PREFERHU PREFERSS PREFERNS BY MAJAREA (1,5) /WSFACTORS Content (3)
 /OMEANS TABLES (Majarea) /DESIGN.

       103 cases accepted.
         0 cases rejected because of out-of-range factor values.
         1 cases rejected because of missing data.
         5 non-empty cells.

         1 design will be processed.

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                                                                    MORE

* * ANALYSIS   OF   VARIANCE -- DESIGN    1 * *

 Combined Observed Means for MAJAREA
 Variable .. PREFERHU
       MAJAREA
      Life Sci         WGT.      4.10526
                     UNWGT.      4.10526
      Social S         WGT.      3.30435
                     UNWGT.      3.30435
      Business         WGT.      3.24138
                     UNWGT.      3.24138
      Math./Te         WGT.      3.17647
                     UNWGT.      3.17647
      Criminal         WGT.      3.00000
                     UNWGT.      3.00000

* * ANALYSIS   OF   VARIANCE -- DESIGN    1 * *

 Variable .. PREFERSS
       MAJAREA
      Life Sci         WGT.      3.73684
                     UNWGT.      3.73684
      Social S         WGT.      3.00000
                     UNWGT.      3.00000
      Business         WGT.      3.31034
                     UNWGT.      3.31034
      Math./Te         WGT.      2.70588
                     UNWGT.      2.70588
      Criminal         WGT.      3.00000
                     UNWGT.      3.00000
```

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Variable .. PREFERNS

MAJAREA		
Life Sci	WGT.	3.68421
	UNWGT.	3.68421
Social S	WGT.	2.78261
	UNWGT.	2.78261
Business	WGT.	3.24138
	UNWGT.	3.24138
Math./Te	WGT.	2.52941
	UNWGT.	2.52941
Criminal	WGT.	3.20000

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	445.95	98	4.55		
CONSTANT	3001.30	1	3001.30	659.56	.000
MAJAREA	34.62	4	8.66	1.90	.116

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* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	155.88	196	.80		
CONTENT	4.15	2	2.07	2.61	.076
MAJAREA BY CONTENT	5.42	8	.68	.85	.559

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18. How important were scheduling problems beyond the student's control, such as full sections or schedule conflicts, in selecting courses to meet requirements in the humanities, social sciences, and natural sciences?

```
Manova SCHEDHU SCHEDSS SCHEDNS by MAJAREA (1,5) /WSFACTORS Content (3)
  /OMEANS TABLES (Majarea) /DESIGN.

        103 cases accepted.
          0 cases rejected because of out-of-range factor values.
          1 cases rejected because of missing data.
          5 non-empty cells.

          1 design will be processed.

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* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

 Combined Observed Means for MAJAREA
 Variable .. SCHEDHU
       MAJAREA
      Life Sci        WGT.      3.10526
                    UNWGT.      3.10526
      Social S        WGT.      1.78261
                    UNWGT.      1.78261
      Business        WGT.      2.10345
                    UNWGT.      2.10345
      Math./Te        WGT.      2.00000
                    UNWGT.      2.00000
      Criminal        WGT.      2.60000
                    UNWGT.      2.60000

* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

 Variable .. SCHEDSS
       MAJAREA
      Life Sci        WGT.      2.84211
                    UNWGT.      2.84211
      Social S        WGT.      2.00000
                    UNWGT.      2.00000
      Business        WGT.      2.17241
                    UNWGT.      2.17241
      Math./Te        WGT.      2.35294
                    UNWGT.      2.35294
      Criminal        WGT.      2.80000
                    UNWGT.      2.80000
```

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Variable .. SCHEDNS

MAJAREA		
Life Sci	WGT.	2.78947
	UNWGT.	2.78947
Social S	WGT.	2.26087
	UNWGT.	2.26087
Business	WGT.	2.10345
	UNWGT.	2.10345
Math./Te	WGT.	2.11765
	UNWGT.	2.11765
Criminal	WGT.	2.80000
	UNWGT.	2.80000

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	273.37	98	2.79		
CONSTANT	1671.08	1	1671.08	599.07	.000
MAJAREA	38.62	4	9.65	3.46	.011

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* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	170.02	196	.87		
CONTENT	.74	2	.37	.43	.652
MAJAREA BY CONTENT	4.60	8	.57	.66	.724

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Scheduling Factors

Responses to Research Questions 17 and 18 were combined to form a summated scale expressing the influence of scheduling problems of the student's own making, or beyond the student's control, on course selection to meet distribution requirements.

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	901.93	98	9.20		
CONSTANT	9151.40	1	9151.40	994.35	.000
MAJAREA	123.10	4	30.78	3.34	.013

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* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	335.02	196	1.71		
CONTENT	1.62	2	.81	.47	.623
MAJAREA BY CONTENT	8.74	8	1.09	.64	.744

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103 cases accepted.
0 cases rejected because of out-of-range factor values.
43 cases rejected because of missing data.
5 non-empty cells.

1 design will be processed.

Cell Means and Standard Deviations

Variable .. PSHUSUB

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	7.211	1.903	19
MAJAREA	Social S	5.087	1.649	23
MAJAREA	Business	5.345	1.895	29
MAJAREA	Math./Te	5.176	2.270	17
MAJAREA	Criminal	5.600	2.293	15
For entire sample		5.641	2.081	103

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Variable .. PSSSSUB

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	6.579	2.293	19
MAJAREA	Social S	5.000	1.954	23
MAJAREA	Business	5.483	1.939	29
MAJAREA	Math./Te	5.059	2.221	17
MAJAREA	Criminal	5.800	1.656	15
For entire sample		5.553	2.061	103

Variable .. PSNSSUB

FACTOR	CODE	Mean	Std. Dev.	N
MAJAREA	Life Sci	6.474	2.144	19
MAJAREA	Social S	5.043	2.205	23
MAJAREA	Business	5.345	2.272	29
MAJAREA	Math./Te	4.647	2.029	17
MAJAREA	Criminal	6.000	1.964	15
For entire sample		5.466	2.200	103

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Variable PSHUSUB

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	63.7008	15.9252	4.0308	.0045
Within Groups	99	391.1357	3.9509		
Total	103	454.8365			

Mean	Group	4	2	3	5	1
5.0000	Grp 4					
5.0870	Grp 2					
5.3448	Grp 3					
5.6000	Grp 5					
7.2105	Grp 1	*	*	*		

(*) Denotes pairs of groups significantly different at the .050 level

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Variable PSSSSUB

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	33.8604	8.4651	2.0836	.0885
Within Groups	100	406.2730	4.0627		
Total	104	440.1333			

No two groups are significantly different at the .050 level

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Variable PSNSSUB

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	39.5036	9.8759	2.1312	.0826
Within Groups	98	454.1274	4.6340		
Total	102	493.6311			

No two groups are significantly different at the .050 level

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Variable PSTOT

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	41.0346	10.2586	3.3440	.0130
Within Groups	98	300.6439	3.0678		
Total	102	341.6785			

Mean	Group	4	2	3	5	1
4.9608	Grp 4					
5.0435	Grp 2					
5.3908	Grp 3					
5.8000	Grp 5					
6.7544	Grp 1	*	*			

(*) Denotes pairs of groups significantly different at the .050 level

19. How beneficial to their general development, and to understanding their majors, did students by degree area find courses in the humanities, social sciences, and natural sciences?

```
Manova BENEFHU BENEFSS BENEFNS by MAJAREA (1,5) /WSFACTORS Content (3)
  /OMEANS TABLES (Majarea) /DESIGN.

       102 cases accepted.
         0 cases rejected because of out-of-range factor values.
         2 cases rejected because of missing data.
         5 non-empty cells.

         1 design will be processed.

* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

 Combined Observed Means for MAJAREA
 Variable .. BENEFHU
       MAJAREA
      Life Sci         WGT.      3.26316
                     UNWGT.      3.26316
      Social S         WGT.      2.91304
                     UNWGT.      2.91304
      Business         WGT.      2.65517
                     UNWGT.      2.65517
      Math./Te         WGT.      2.56250
                     UNWGT.      2.56250
      Criminal         WGT.      2.53333
                     UNWGT.      2.53333

* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

 Variable .. BENEFSS
       MAJAREA
      Life Sci         WGT.      3.57895
                     UNWGT.      3.57895
      Social S         WGT.      3.39130
                     UNWGT.      3.39130
      Business         WGT.      2.93103
                     UNWGT.      2.93103
      Math./Te         WGT.      2.93750
                     UNWGT.      2.93750
      Criminal         WGT.      3.53333
                     UNWGT.      3.53333
```

```
* * ANALYSIS   OF   VARIANCE -- DESIGN   1 * *

 Variable .. BENEFNS
       MAJAREA
      Life Sci          WGT.        3.78947
                      UNWGT.        3.78947
      Social S          WGT.        3.00000
                      UNWGT.        3.00000
      Business          WGT.        2.96552
                      UNWGT.        2.96552
      Math./Te          WGT.        2.68750
                      UNWGT.        2.68750
      Criminal          WGT.        2.80000
                      UNWGT.        2.80000

* * ANALYSIS   OF   VARIANCE -- DESIGN   1 * *

Tests of Between-Subjects Effects.

 Tests of Significance for T1 using UNIQUE sums of squares
 Source of Variation            SS      DF        MS          F  Sig of F

 WITHIN CELLS               274.88      97      2.83
 CONSTANT                  2661.51       1   2661.51     939.20      .000
 MAJAREA                     22.80       4      5.70       2.01      .099

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* * ANALYSIS   OF   VARIANCE -- DESIGN   1 * *

Tests involving 'CONTENT' Within-Subject Effect.

 AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares
 Source of Variation            SS      DF        MS          F  Sig of F

 WITHIN CELLS               161.46     194       .83
 CONTENT                     11.53       2      5.76       6.93      .001
 MAJAREA BY CONTENT           6.06       8       .76        .91      .509

- - - - - - - - - -

Manova MAJBENHU MAJBENSS MAJBENNS by MAJAREA (1,5) /WSFACTORS Content (3)
 /OMEANS TABLES (Majarea) /DESIGN.

       102 cases accepted.
         0 cases rejected because of out-of-range factor values.
         2 cases rejected because of missing data.
         5 non-empty cells.

         1 design will be processed.

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```

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Combined Observed Means for MAJAREA
Variable .. MAJBENHU

MAJAREA		
Life Sci	WGT.	2.15789
	UNWGT.	2.15789
Social S	WGT.	2.65217
	UNWGT.	2.65217
Business	WGT.	1.55172
	UNWGT.	1.55172
Math./Te	WGT.	1.56250
	UNWGT.	1.56250
Criminal	WGT.	2.26667
	UNWGT.	2.26667

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Variable .. MAJBENSC

MAJAREA		
Life Sci	WGT.	3.15789
	UNWGT.	3.15789
Social S	WGT.	3.69565
	UNWGT.	3.69565
Business	WGT.	2.24138
	UNWGT.	2.24138
Math./Te	WGT.	1.93750
	UNWGT.	1.93750
Criminal	WGT.	3.53333
	UNWGT.	3.53333

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Variable .. MAJBENNS

MAJAREA		
Life Sci	WGT.	3.57895
	UNWGT.	3.57895
Social S	WGT.	2.30435
	UNWGT.	2.30435
Business	WGT.	1.82759
	UNWGT.	1.82759
Math./Te	WGT.	2.06250
	UNWGT.	2.06250
Criminal	WGT.	2.40000
	UNWGT.	2.40000

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	235.39	97	2.43		
CONSTANT	1750.12	1	1750.12	721.19	.000
MAJAREA	77.53	4	19.38	7.99	.000

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* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	223.95	194	1.15		
CONTENT	36.95	2	18.47	16.00	.000
MAJAREA BY CONTENT	29.77	8	3.72	3.22	.002

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Variable BENEFHU

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	8.2217	2.0554	1.3024	.2744
Within Groups	99	156.2398	1.5782		
Total	103	164.4615			

No two groups are significantly different at the .050 level

MORE

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Variable BENEFSS

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	9.7082	2.4271	1.7641	.1421
Within Groups	99	136.2052	1.3758		
Total	103	145.9135			

No two groups are significantly different at the .050 level

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Variable BENEFNS

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	14.3515	3.5879	2.3378	.0606
Within Groups	98	150.4058	1.5348		
Total	102	164.7573			

No two groups are significantly different at the .050 level

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Variable TOTBEN

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	7.5984	1.8996	2.0110	.0989
Within Groups	97	91.6260	.9446		
Total	101	99.2244			

No two groups are significantly different at the .050 level

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable MAJBENHU

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	21.6505	5.4126	4.5277	.0021
Within Groups	99	118.3495	1.1954		
Total	103	140.0000			

Mean	Group	4	3	1	5	2
1.5000	Grp 4					
1.5517	Grp 3					
2.1579	Grp 1					
2.2667	Grp 5					
2.6522	Grp 2	*	*			

(*) Denotes pairs of groups significantly different at the .050 level

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable MAJBENSS

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	52.6192	13.1548	6.8465	.0001
Within Groups	99	190.2173	1.9214		
Total	103	242.8365			

Mean	Group	4	3	1	5	2
1.8889	Grp 4					
2.2414	Grp 3					
3.1579	Grp 1	*				
3.5333	Grp 5	*	*			
3.6957	Grp 2	*	*			

(*) Denotes pairs of groups significantly different at the .050 level

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable MAJBENNS

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	38.7415	9.6854	6.1940	.0002
Within Groups	98	153.2391	1.5637		
Total	102	191.9806			

Mean	Group	3	4	2	5	1
1.8276	Grp 3					
2.0000	Grp 4					
2.3043	Grp 2					
2.4000	Grp 5					
3.5789	Grp 1	*	*	*		

(*) Denotes pairs of groups significantly different at the .050 level

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable TOTMAJ

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	25.8426	6.4606	7.9869	.0000
Within Groups	97	78.4636	.8089		
Total	101	104.3061			

Mean	Group	4	3	5	2	1
1.8542	Grp 4					
1.8736	Grp 3					
2.7333	Grp 5		*			
2.8841	Grp 2	*	*			
2.9649	Grp 1	*	*			

(*) Denotes pairs of groups significantly different at the .050 level

20. How beneficial to their general development, and to understanding their majors, did students by gender find courses in the humanities, social sciences, and natural sciences?

```
MANOVA BENEFHU BENEFSS BENEFNS by  gender (1,2) /WSFACTORS Content (3) /OMEANS.

       102 cases accepted.
         0 cases rejected because of out-of-range factor values.
        44 cases rejected because of missing data.
         2 non-empty cells.

         1 design will be processed.
* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests involving 'CONTENT' Within-Subject Effect.
```

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	297.63	100	2.98		
CONSTANT	2748.47	1	2748.47	923.45	.000
GENDER	.04	1	.04	.01	.905

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AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	167.05	200	.84		
CONTENT	10.79	2	5.39	6.46	.002
GENDER BY CONTENT	.47	2	.24	.28	.753

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```
MANOVA MAJBENHU MAJBENSS MAJBENNS BY Gender (1,2) /WSFACTORS content (3).

* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests of Between-Subjects Effects.
```

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	310.38	100	3.10		
CONSTANT	1780.74	1	1780.74	573.74	.000
GENDER	2.54	1	2.54	.82	.368

```
* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests involving 'CONTENT' Within-Subject Effect.
```

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	251.93	200	1.26		
CONTENT	39.39	2	19.70	15.64	.000
GENDER BY CONTENT	1.79	2	.89	.71	.493

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21. How beneficial to their general development, and to understanding their majors, did students by transfer/nontransfer status, find courses in the humanities, social sciences, and natural sciences?

```
MANOVA MAJBENHU MAJBENSS MAJBENNS BY transfer (1,3) /WSFACTORS content (3).

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* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests of Between-Subjects Effects.
```

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	305.99	99	3.09		
CONSTANT	114.58	1	114.58	37.07	.000
TRANSFER	6.93	2	3.47	1.12	.330

```
- - - - - - - - - - -

* * ANALYSIS  OF  VARIANCE -- DESIGN   1 * *

Tests involving 'CONTENT' Within-Subject Effect.
```

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	251.59	198	1.27		
CONTENT	2.27	2	1.14	.89	.410
TRANSFER BY CONTENT	2.13	4	.53	.42	.795

- - - - - - - - - - -

```
MANOVA BENEFHU BENEFSS BENEFNS by trtr (1,2) /WSFACTORS Content (3) /OMEANS.
```

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	297.13	100	2.97		
CONSTANT	2766.23	1	2766.23	930.99	.000
TRTR	.54	1	.54	.18	.669

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* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	161.41	200	.81		
CONTENT	11.88	2	5.94	7.36	.001
TRTR BY CONTENT	6.11	2	3.06	3.79	.024

- - - - - - - - - - -

22. How beneficial to their general development, and to understanding their majors, did students by age find courses in the humanities, social sciences, and natural sciences?

```
MANOVA BENEFHU BENEFSS BENEFNS BY AGE (1,2) /WSFACTORS CONTENT (3)
 /OMEANS.
```

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	271.07	100	2.71		
CONSTANT	2616.60	1	2616.60	965.28	.000
AGE	26.60	1	26.60	9.81	.002

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* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	156.60	200	.78		
CONTENT	3.67	2	1.83	2.34	.099
AGE BY CONTENT	10.92	2	5.46	6.98	.001

\- - - - - - - - - -

```
MANOVA MAJBENHU MAJBENSS MAJBENNS  BY age (1,2) /WSFACTORS content (3).
```

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	305.64	100	3.06		
CONSTANT	1633.95	1	1633.95	534.60	.000
AGE	7.28	1	7.28	2.38	.126

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* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	253.22	200	1.27		
CONTENT	32.26	2	16.13	12.74	.000
AGE BY CONTENT	.50	2	.25	.20	.822

Hypothesis 4: Nontraditional students will rate courses in the humanities as more beneficial to their general development than other students.

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Cell Means and Standard Deviations
Variable .. BENEFHU

FACTOR	CODE	Mean	Std. Dev.	N
AGE	25+	3.625	1.157	32
AGE	25-	2.414	1.123	70
For entire sample		2.794	1.261	102

\- - - - - - - - - - -

Variable .. BENEFSS

FACTOR	CODE	Mean	Std. Dev.	N
AGE	25+	3.469	1.295	32
AGE	25-	3.143	1.120	70
For entire sample		3.245	1.181	102

Variable .. BENEFNS

FACTOR	CODE	Mean	Std. Dev.	N
AGE	25+	3.312	1.355	32
AGE	25-	2.943	1.226	70
For entire sample		3.059	1.273	102

MORE

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Cell Means and Standard Deviations (CONT.)
Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	271.07	100	2.71		
CONSTANT	2616.60	1	2616.60	965.28	.000
AGE	26.60	1	26.60	9.81	.002

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	156.60	200	.78		
CONTENT	3.67	2	1.83	2.34	.099
AGE BY CONTENT	10.92	2	5.46	6.98	.001

\- - - - - - - - - - -

23. How beneficial to their general development, and to understanding their majors, did students by the country in which they received their secondary education find courses in the humanities, social sciences, and natural sciences?

```
MANOVA BENEFHU BENEFSS BENEFNS by hseducat (1,2) /WSFACTORS Content (3)
/OMEANS.
```

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	297.43	100	2.97		
CONSTANT	2400.40	1	2400.40	807.04	.000
HSEDUCAT	.24	1	.24	.08	.776

-

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	161.60	200	.81		
CONTENT	4.11	2	2.06	2.55	.081
HSEDUCAT BY CONTENT	5.92	2	2.96	3.66	.027

- - - - - - - - - -

```
MANOVA MAJBENHU MAJBENSS MAJBENNS BY HSEDUCAT (1,2) /WSFACTORS content (3)
/OMEANS.
```

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* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	306.85	100	3.07		
CONSTANT	1452.10	1	1452.10	473.22	.000
HSEDUCAT	6.06	1	6.06	1.98	.163

- - - - - - - - - - -

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	251.00	200	1.26		
CONTENT	25.46	2	12.73	10.14	.000
HSEDUCAT BY CONTENT	2.71	2	1.36	1.08	.341

24. Did students by degree area think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

```
Manova CHANGEHU CHANGESS CHANGENS by MAJAREA (1,5) /WSFACTORS Content (3)
  /OMEANS TABLES (Majarea) /DESIGN.

       102 cases accepted.
         0 cases rejected because of out-of-range factor values.
         2 cases rejected because of missing data.
         5 non-empty cells.

         1 design will be processed.

 - - - - - - -
 Combined Observed Means for MAJAREA
 Variable .. CHANGEHU
       MAJAREA
      Life Sci          WGT.       2.15789
                      UNWGT.       2.15789
      Social S          WGT.       2.43478
                      UNWGT.       2.43478
      Business          WGT.       2.24138
                      UNWGT.       2.24138
      Math./Te          WGT.       2.25000
                      UNWGT.       2.25000
      Criminal          WGT.       2.40000
                      UNWGT.       2.40000

 Variable .. CHANGESS
       MAJAREA
      Life Sci          WGT.       3.26316
                      UNWGT.       3.26316
      Social S          WGT.       3.00000
                      UNWGT.       3.00000
      Business          WGT.       2.62069
                      UNWGT.       2.62069
      Math./Te          WGT.       2.37500
                      UNWGT.       2.37500
      Criminal          WGT.       3.00000
                      UNWGT.       3.00000

 Variable .. CHANGENS
       MAJAREA
      Life Sci          WGT.       2.84211
                      UNWGT.       2.84211
      Social S          WGT.       2.91304
                      UNWGT.       2.91304
      Business          WGT.       2.62069
                      UNWGT.       2.62069
      Math./Te          WGT.       2.62500
                      UNWGT.       2.62500
      Criminal          WGT.       2.66667
                      UNWGT.       2.66667
```

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	154.69	97	1.59		
CONSTANT	1993.10	1	1993.10	1249.78	.000
MAJAREA	6.42	4	1.61	1.01	.408

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AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	143.92	194	.74		
CONTENT	16.45	2	8.22	11.08	.000
MAJAREA BY CONTENT	5.48	8	.69	.92	.498

- - - - - - - - - - -

25. Did students by gender think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

```
102 cases accepted.
  0 cases rejected because of out-of-range factor values.
 44 cases rejected because of missing data.
  2 non-empty cells.

  1 design will be processed.
```

MORE

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	159.63	100	1.60		
CONSTANT	2038.08	1	2038.08	1276.74	.000
GENDER	1.48	1	1.48	.93	.337

\- - - - - - - - - - -

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	146.72	200	.73		
CONTENT	18.75	2	9.37	12.78	.000
GENDER BY CONTENT	2.68	2	1.34	1.83	.163

\- - - - - - - - - - -

26. Did students by age think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

```
102 cases accepted.
  0 cases rejected because of out-of-range factor values.
 44 cases rejected because of missing data.
  2 non-empty cells.

  1 design will be processed.
```

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	160.72	100	1.61		
CONSTANT	1834.67	1	1834.67	1141.51	.000
AGE	.39	1	.39	.24	.623

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	148.93	200	.74		
CONTENT	15.37	2	7.69	10.32	.000
AGE BY CONTENT	.47	2	.24	.32	.729

- - - - - - - - - -

27. Did students by transfer/nontransfer status think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

```
102 cases accepted.
  0 cases rejected because of out-of-range factor values.
 44 cases rejected because of missing data.
  3 non-empty cells.

  1 design will be processed.
```

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	157.24	99	1.59		
CONSTANT	138.40	1	138.40	87.14	.000
TRANSFER	3.88	2	1.94	1.22	.300

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* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	148.12	198	.75		
CONTENT	1.99	2	1.00	1.33	.266
TRANSFER BY CONTENT	1.28	4	.32	.43	.788

28. Did students by the country in which they received their secondary education think credit hours required in the humanities, social sciences, and natural sciences should be increased, decreased, or remain the same?

```
102 cases accepted.
  0 cases rejected because of out-of-range factor values.
 44 cases rejected because of missing data.
  2 non-empty cells.

  1 design will be processed.
```

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	154.27	100	1.54		
CONSTANT	1697.56	1	1697.56	1100.38	.000
HSEDUCAT	6.84	1	6.84	4.44	.038

* * ANALYSIS OF VARIANCE -- DESIGN 1 * *

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	149.09	200	.75		
CONTENT	13.32	2	6.66	8.93	.000
HSEDUCAT BY CONTENT	.31	2	.16	.21	.810

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Student Evaluation of General Education

A summated scale was created by combining the responses to Research Questions 19 and 24. The maximum mean value for each distributional area was 15. The minimum value was 3. The summated scale represents the perceived value placed on the distributional course in terms of benefit to general development, benefit to understanding of the major, and student evaluation of whether credit requirements should be changed and in what direction.

```
manova / BMCHUSUB BMCSSSUB BMCNSSUB by MAJAREA (1,5) /WSFACTORS
content (3) /OMEANS.
```

*** * ANALYSIS OF VARIANCE -- DESIGN 1 * ***

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	1365.44	97	14.08		
CONSTANT	19062.91	1	19062.91	1354.22	.000
MAJAREA	237.02	4	59.26	4.21	.003

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*** * ANALYSIS OF VARIANCE -- DESIGN 1 * ***

Tests involving 'CONTENT' Within-Subject Effect.

AVERAGED Tests of Significance for MEAS.1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	946.62	194	4.88		
CONTENT	178.39	2	89.20	18.28	.000
MAJAREA BY CONTENT	68.47	8	8.56	1.75	.088

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Variable BMCHUSUB

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	50.9499	12.7375	1.7793	.1390
Within Groups	99	708.7040	7.1586		
Total	103	759.6538			

No two groups are significantly different at the .050 level

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable BMCSSSUB

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	154.7972	38.6993	4.9443	.0011
Within Groups	98	767.0475	7.8270		
Total	102	921.8447			

No two groups are significantly different at the .050 level

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable BMCNSSUB

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	110.1464	27.5366	3.1772	.0168
Within Groups	98	849.3682	8.6670		
Total	102	959.5146			

(*) Denotes pairs of groups significantly different at the .050 level

Mean	Group	4	3	5	2	1
7.2941	Grp 4					
7.4138	Grp 3					
7.8667	Grp 5					
8.2174	Grp 2					
10.2105	Grp 1		*			

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Variable BMCTOT

By Variable MAJAREA Major Area (5)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	4	79.0067	19.7517	4.2094	.0035
Within Groups	97	455.1458	4.6922		
Total	101	534.1525			

Mean	Group	4	3	5	2	1
7.0000	Grp 4					
7.2184	Grp 3					
8.3778	Grp 5					
8.7681	Grp 2					
9.2632	Grp 1	*	*			

(*) Denotes pairs of groups significantly different at the .050 level

<u>Hypothesis 5</u>: Students completing their humanities requirements in their junior or senior years will rate courses in the humanities as more beneficial to their general development than other students.

```
T-TEST /GROUPS HUMSTAT (1,2) /VARIABLES BENEFHU MAJBENHU CHANGEHU.

Independent samples of  HUMSTAT

Group 1:  HUMSTAT  EQ     1.00          Group 2:  HUMSTAT  EQ     2.00
```

t-test for: BENEFHU

	Number of Cases	Mean	Standard Deviation	Standard Error
Group 1	11	2.1818	.982	.296
Group 2	93	2.8387	1.279	.133

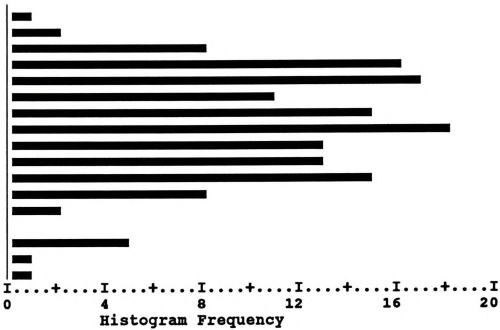
		Pooled Variance Estimate			Separate Variance Estimate		
F Value	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
1.70	.361	-1.64	102	.103	-2.03	14.36	.062

APPENDIX G

DISTRIBUTION OF CREDIT HOURS EARNED UPON COMPLETION OF GENERAL EDUCATION REQUIREMENTS

CRHUMET   Credit hours earned when HU requirement

Count	Midpoint
1	47
2	62
8	77
16	92
17	107
11	122
15	137
18	152
13	167
13	182
15	197
8	212
2	227
0	242
5	257
1	272
1	287



MORE

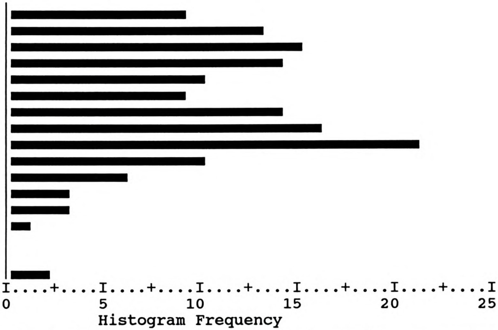
CRHUMET   Credit hours earned when HU requirement

Mean	148.027	Median	146.250	Mode	98.000
Std Dev	48.909	Skewness	.383	Minimum	44.000
Maximum	289.000				

Valid Cases	146	Missing Cases	0

CRSSMET Credit Hours earned when SS requirement

Count	Midpoint
9	23
13	41
15	59
14	77
10	95
9	113
14	131
16	149
21	167
10	185
6	203
3	221
3	239
1	257
0	275
0	293
2	311



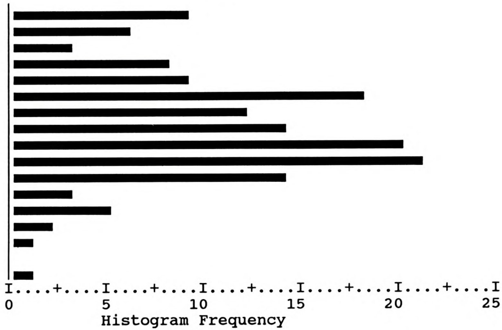
CRSSMET Credit Hours earned when SS requirement

Mean	120.845	Median	128.500	Mode	170.000
Std Dev	62.991	Minimum	19.000	Maximum	315.000

Valid Cases 146 Missing Cases 0

CRNSMET Credit hours earned when NS requirement

Count	Midpoint
9	29
6	46
3	63
8	80
9	97
18	114
12	131
14	148
20	165
21	182
14	199
3	216
5	233
2	250
1	267
0	284
1	301



CRNSMET Credit hours earned when NS requirement

Mean	142.300	Median	151.250	Mode	33.000
Std Dev	55.975	Minimum	28.000	Maximum	302.800

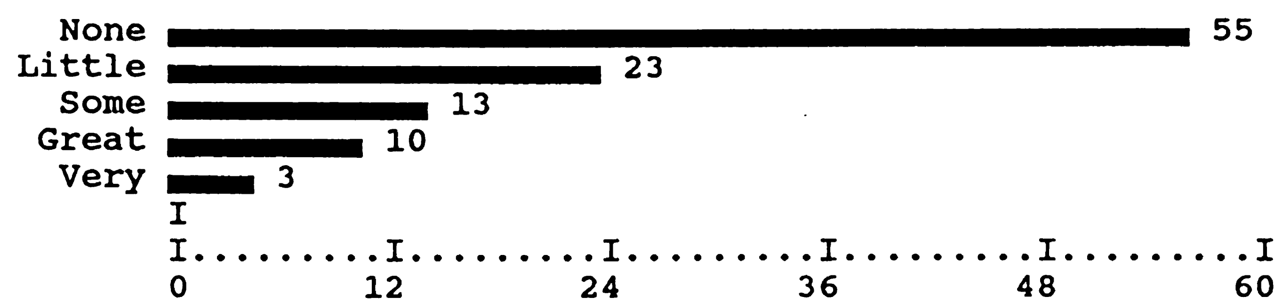
Valid Cases 146 Missing Cases 0

APPENDIX H

DISTRIBUTION OF STUDENT RESPONSES TO FACTORS OR PERSONS AFFECTING COURSE SELECTION

FACADVHU

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	1	55	37.7	52.9	52.9
Little	2	23	15.8	22.1	75.0
Some	3	13	8.9	12.5	87.5
Great	4	10	6.8	9.6	97.1
Very	5	3	2.1	2.9	100.0
	.	42	28.8	MISSING	
	TOTAL	146	100.0	100.0	

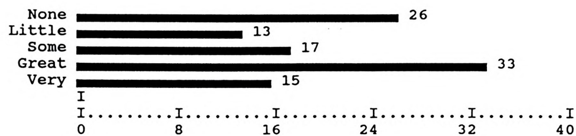


Mean	1.875	Median	1.000	Mode	1.000
Std Dev	1.138	Minimum	1.000	Maximum	5.000

Valid Cases 104 Missing Cases 42

STUADVHU

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	1	26	17.8	25.0	25.0
Little	2	13	8.9	12.5	37.5
Some	3	17	11.6	16.3	53.8
Great	4	33	22.6	31.7	85.6
Very	5	15	10.3	14.4	100.0
	.	42	28.8	MISSING	
	TOTAL	146	100.0	100.0	



Mean	2.981	Median	3.000	Mode	4.000
Std Dev	1.428	Minimum	1.000	Maximum	5.000

Valid Cases 104 Missing Cases 42

PRINTHU

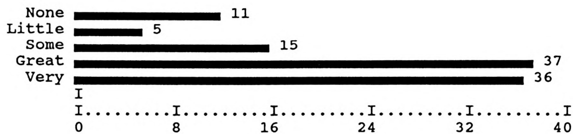
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	1	31	21.2	29.8	29.8
Little	2	15	10.3	14.4	44.2
Some	3	20	13.7	19.2	63.5
Great	4	26	17.8	25.0	88.5
Very	5	12	8.2	11.5	100.0
	.	42	28.8	MISSING	
	TOTAL	146	100.0	100.0	

Mean	2.740	Median	3.000	Mode	1.000
Std Dev	1.414	Minimum	1.000	Maximum	5.000

Valid Cases 104 Missing Cases 42

REPUTHU

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	1	11	7.5	10.6	10.6
Little	2	5	3.4	4.8	15.4
Some	3	15	10.3	14.4	29.8
Great	4	37	25.3	35.6	65.4
Very	5	36	24.7	34.6	100.0
	.	42	28.8	MISSING	
		-------	-------	-------	
	TOTAL	146	100.0	100.0	

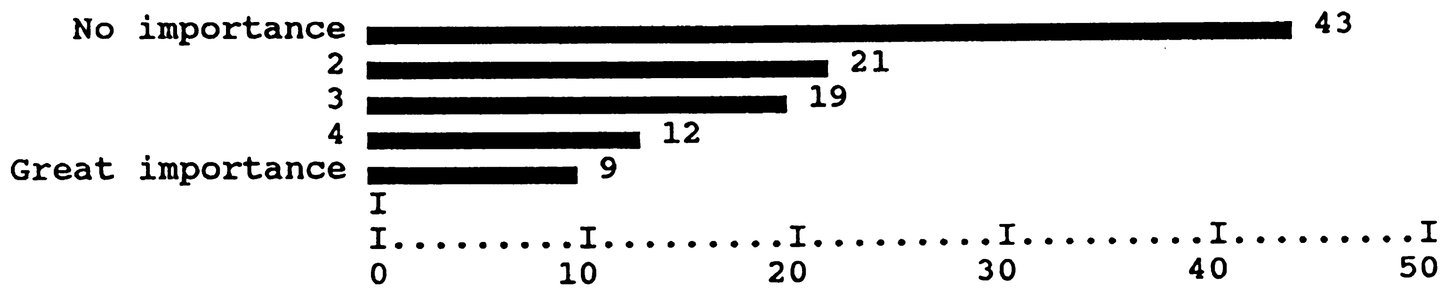


Mean	3.788	Median	4.000	Mode	4.000
Std Dev	1.267	Minimum	1.000	Maximum	5.000

Valid Cases	104	Missing Cases	42

CONTENHU

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No importance	1	43	29.5	41.3	41.3
	2	21	14.4	20.2	61.5
	3	19	13.0	18.3	79.8
	4	12	8.2	11.5	91.3
Great importance	5	9	6.2	8.7	100.0
	.	42	28.8	MISSING	
	TOTAL	146	100.0	100.0	

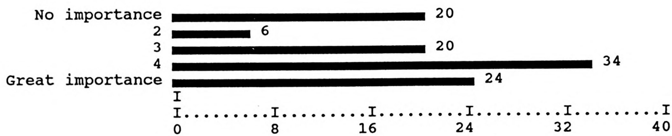


Mean	2.260	Median	2.000	Mode	1.000
Std Dev	1.337	Minimum	1.000	Maximum	5.000

Valid Cases 104 Missing Cases 42

PREFERHU

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No importance	1	20	13.7	19.2	19.2
	2	6	4.1	5.8	25.0
	3	20	13.7	19.2	44.2
	4	34	23.3	32.7	76.9
Great importance	5	24	16.4	23.1	100.0
	.	42	28.8	MISSING	
	TOTAL	146	100.0	100.0	

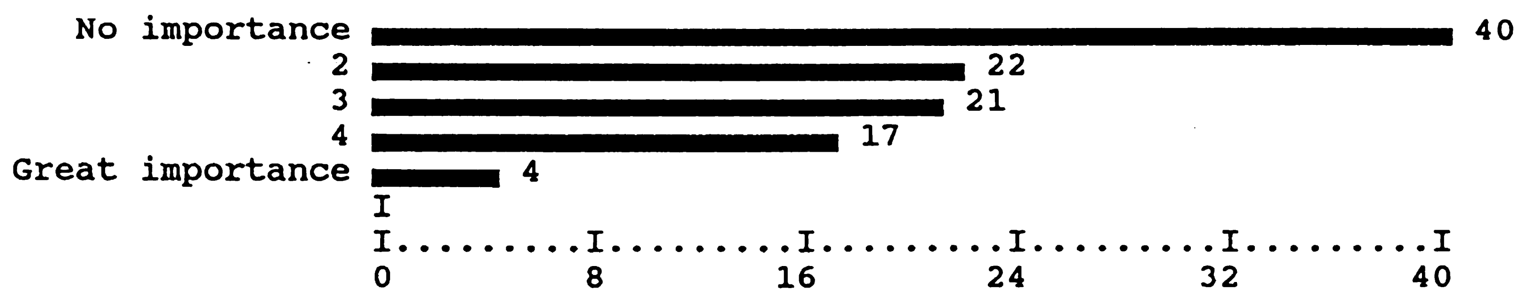


Mean	3.346	Median	4.000	Mode	4.000
Std Dev	1.406	Minimum	1.000	Maximum	5.000

Valid Cases 104 Missing Cases 42

SCHEDHU

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No importance	1	40	27.4	38.5	38.5
	2	22	15.1	21.2	59.6
	3	21	14.4	20.2	79.8
	4	17	11.6	16.3	96.2
Great importance	5	4	2.7	3.8	100.0
	.	42	28.8	MISSING	
	TOTAL	146	100.0	100.0	

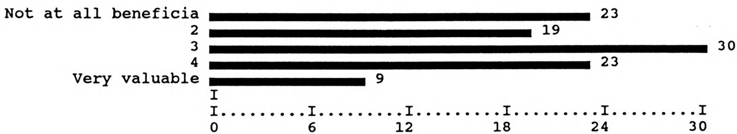


Mean	2.260	Median	2.000	Mode	1.000
Std Dev	1.239	Minimum	1.000	Maximum	5.000

Valid Cases 104 Missing Cases 42

BENEFHU

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all beneficia	1	23	15.8	22.1	22.1
	2	19	13.0	18.3	40.4
	3	30	20.5	28.8	69.2
	4	23	15.8	22.1	91.3
Very valuable	5	9	6.2	8.7	100.0
	.	42	28.8	MISSING	
	TOTAL	146	100.0	100.0	



Mean	2.769	Median	3.000	Mode	3.000
Std Dev	1.264	Minimum	1.000	Maximum	5.000

Valid Cases	104	Missing Cases	42

MAJBENHU

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all beneficia	1	51	34.9	49.0	49.0
	2	19	13.0	18.3	67.3
	3	19	13.0	18.3	85.6
	4	13	8.9	12.5	98.1
Very beneficial	5	2	1.4	1.9	100.0
	.	42	28.8	MISSING	
	TOTAL	146	100.0	100.0	

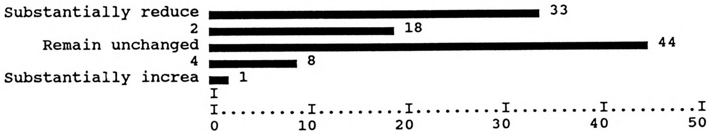
```
Not at all beneficia ███████████████████████████████████████████ 51
                   2 ████████████████ 19
                   3 ████████████████ 19
                   4 ███████████ 13
     Very beneficial ██ 2
                     I
                     I.........I.........I.........I.........I.........I
                     0        12        24        36        48        60
```

Mean	2.000	Median	2.000	Mode	1.000
Std Dev	1.166	Minimum	1.000	Maximum	5.000

Valid Cases 104 Missing Cases 42

CHANGEHU

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Substantially reduce	1	33	22.6	31.7	31.7
	2	18	12.3	17.3	49.0
Remain unchanged	3	44	30.1	42.3	91.3
	4	8	5.5	7.7	99.0
Substantially increa	5	1	.7	1.0	100.0
	.	42	28.8	MISSING	
	TOTAL	146	100.0	100.0	

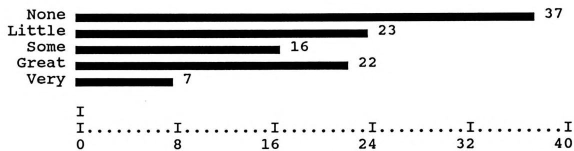


Mean	2.288	Median	3.000	Mode	3.000
Std Dev	1.030	Minimum	1.000	Maximum	5.000

Valid Cases 104 Missing Cases 42

FACADVSS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	1	37	25.3	35.2	35.2
Little	2	23	15.8	21.9	57.1
Some	3	16	11.0	15.2	72.4
Great	4	22	15.1	21.0	93.3
Very	5	7	4.8	6.7	100.0
	.	41	28.1	MISSING	
	TOTAL	146	100.0	100.0	



Mean	2.419	Median	2.000	Mode	1.000
Std Dev	1.336	Minimum	1.000	Maximum	5.000

Valid Cases 105 Missing Cases 41

STUADVSS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	1	19	13.0	18.1	18.1
Little	2	8	5.5	7.6	25.7
Some	3	24	16.4	22.9	48.6
Great	4	43	29.5	41.0	89.5
Very	5	11	7.5	10.5	100.0
	.	41	28.1	MISSING	
	TOTAL	146	100.0	100.0	

Mean	3.181	Median	4.000	Mode	4.000
Std Dev	1.269	Minimum	1.000	Maximum	5.000

Valid Cases 105 Missing Cases 41

PRINTSS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	1	18	12.3	17.1	17.1
Little	2	15	10.3	14.3	31.4
Some	3	28	19.2	26.7	58.1
Great	4	31	21.2	29.5	87.6
Very	5	13	8.9	12.4	100.0
	.	41	28.1	MISSING	
	TOTAL	146	100.0	100.0	

Mean	3.057	Median	3.000	Mode	4.000
Std Dev	1.277	Minimum	1.000	Maximum	5.000

Valid Cases 105 Missing Cases 41

REPUTASS

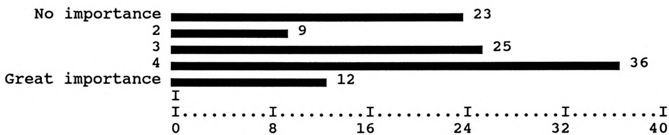
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	1	16	11.0	15.2	15.2
Little	2	9	6.2	8.6	23.8
Some	3	28	19.2	26.7	50.5
Great	4	31	21.2	29.5	80.0
Very	5	21	14.4	20.0	100.0
	.	41	28.1	MISSING	
	TOTAL	146	100.0	100.0	

Mean	3.305	Median	3.000	Mode	4.000
Std Dev	1.309	Minimum	1.000	Maximum	5.000

Valid Cases 105 Missing Cases 41

CONTENSS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No importance	1	23	15.8	21.9	21.9
	2	9	6.2	8.6	30.5
	3	25	17.1	23.8	54.3
	4	36	24.7	34.3	88.6
Great importance	5	12	8.2	11.4	100.0
	.	41	28.1	MISSING	
	TOTAL	146	100.0	100.0	

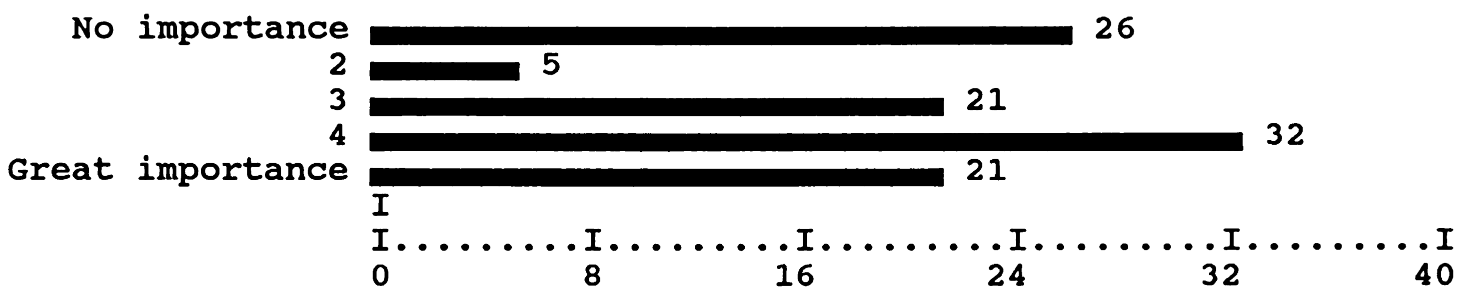


Mean	3.048	Median	3.000	Mode	4.000
Std Dev	1.333	Minimum	1.000	Maximum	5.000

Valid Cases 105 Missing Cases 41

PREFERSS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No importance	1	26	17.8	24.8	24.8
	2	5	3.4	4.8	29.5
	3	21	14.4	20.0	49.5
	4	32	21.9	30.5	80.0
Great importance	5	21	14.4	20.0	100.0
	.	41	28.1	MISSING	
		-------	-------	-------	
	TOTAL	146	100.0	100.0	

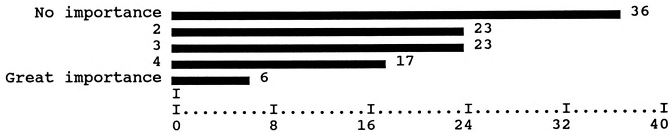


Mean	3.162	Median	4.000	Mode	4.000
Std Dev	1.462	Minimum	1.000	Maximum	5.000

Valid Cases 105 Missing Cases 41

SCHEDSS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No importance	1	36	24.7	34.3	34.3
	2	23	15.8	21.9	56.2
	3	23	15.8	21.9	78.1
	4	17	11.6	16.2	94.3
Great importance	5	6	4.1	5.7	100.0
	.	41	28.1	MISSING	
		-------	-------	-------	
	TOTAL	146	100.0	100.0	

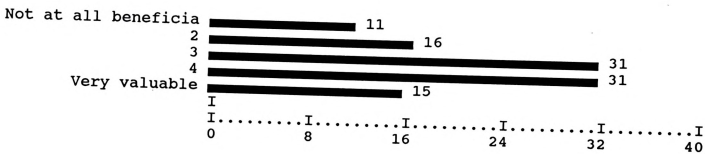


Mean	2.371	Median	2.000	Mode	1.000
Std Dev	1.265	Minimum	1.000	Maximum	5.000

Valid Cases 105 Missing Cases 41

BENEFSS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all beneficia	1	11	7.5	10.6	10.6
	2	16	11.0	15.4	26.0
	3	31	21.2	29.8	55.8
Very valuable	4	31	21.2	29.8	85.6
	5	15	10.3	14.4	100.0
	.	42	28.8	MISSING	
	TOTAL	146	100.0	100.0	

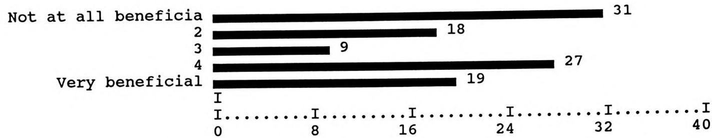


Mean	3.221	Median	3.000	Mode	3.000
Std Dev	1.190	Minimum	1.000	Maximum	5.000

Valid Cases 104 Missing Cases 42

MAJBENSS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all beneficia	1	31	21.2	29.8	29.8
	2	18	12.3	17.3	47.1
	3	9	6.2	8.7	55.8
	4	27	18.5	26.0	81.7
Very beneficial	5	19	13.0	18.3	100.0
	.	42	28.8	MISSING	
	TOTAL	146	100.0	100.0	

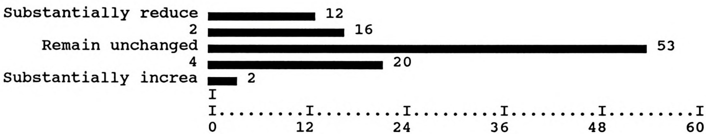


Mean	2.856	Median	3.000	Mode	1.000
Std Dev	1.535	Minimum	1.000	Maximum	5.000

Valid Cases	104	Missing Cases	42

CHANGESS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Substantially reduce	1	12	8.2	11.7	11.7
	2	16	11.0	15.5	27.2
Remain unchanged	3	53	36.3	51.5	78.6
	4	20	13.7	19.4	98.1
Substantially increa	5	2	1.4	1.9	100.0
	.	43	29.5	MISSING	
		-------	-------	-------	
	TOTAL	146	100.0	100.0	

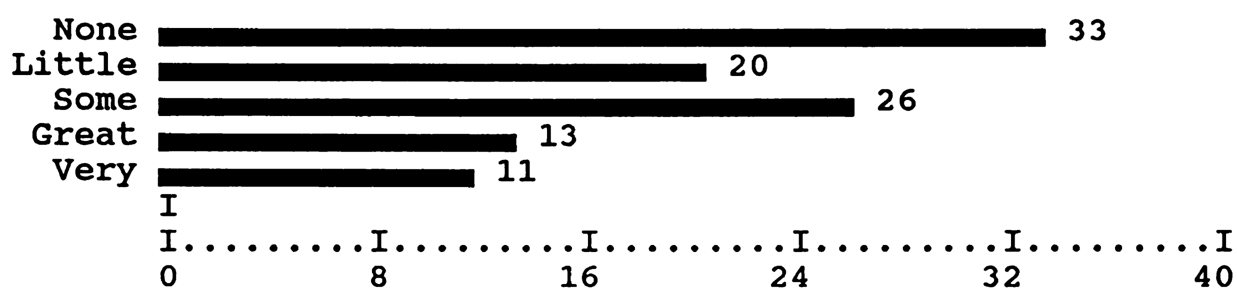


Mean	2.845	Median	3.000	Mode	3.000
Std Dev	.937	Minimum	1.000	Maximum	5.000

Valid Cases	103	Missing Cases	43

FACADVNS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	1	33	22.6	32.0	32.0
Little	2	20	13.7	19.4	51.5
Some	3	26	17.8	25.2	76.7
Great	4	13	8.9	12.6	89.3
Very	5	11	7.5	10.7	100.0
	.	43	29.5	MISSING	
		-------	-------	-------	
	TOTAL	146	100.0	100.0	



Mean	2.505	Median	2.000	Mode	1.000
Std Dev	1.342	Minimum	1.000	Maximum	5.000

Valid Cases	103	Missing Cases	43

STUADVNS

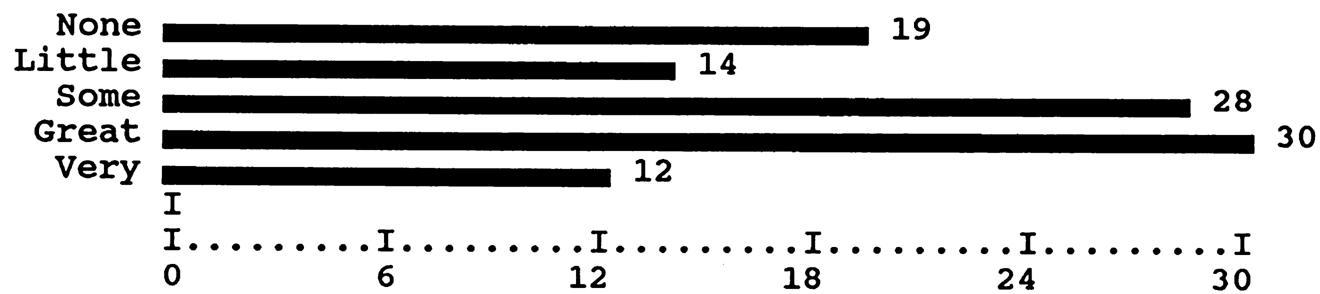
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	1	20	13.7	19.4	19.4
Little	2	15	10.3	14.6	34.0
Some	3	23	15.8	22.3	56.3
Great	4	33	22.6	32.0	88.3
Very	5	12	8.2	11.7	100.0
	.	43	29.5	MISSING	
	TOTAL	146	100.0	100.0	

Mean	3.019	Median	3.000	Mode	4.000
Std Dev	1.313	Minimum	1.000	Maximum	5.000

Valid Cases 103 Missing Cases 43

PRINTNS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	1	19	13.0	18.4	18.4
Little	2	14	9.6	13.6	32.0
Some	3	28	19.2	27.2	59.2
Great	4	30	20.5	29.1	88.3
Very	5	12	8.2	11.7	100.0
	.	43	29.5	MISSING	
	TOTAL	146	100.0	100.0	

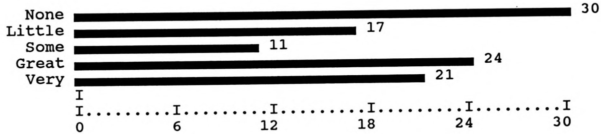


Mean	3.019	Median	3.000	Mode	4.000
Std Dev	1.283	Minimum	1.000	Maximum	5.000

Valid Cases 103 Missing Cases 43

REPUTANS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
None	1	30	20.5	29.1	29.1
Little	2	17	11.6	16.5	45.6
Some	3	11	7.5	10.7	56.3
Great	4	24	16.4	23.3	79.6
Very	5	21	14.4	20.4	100.0
	.	43	29.5	MISSING	
	TOTAL	146	100.0	100.0	

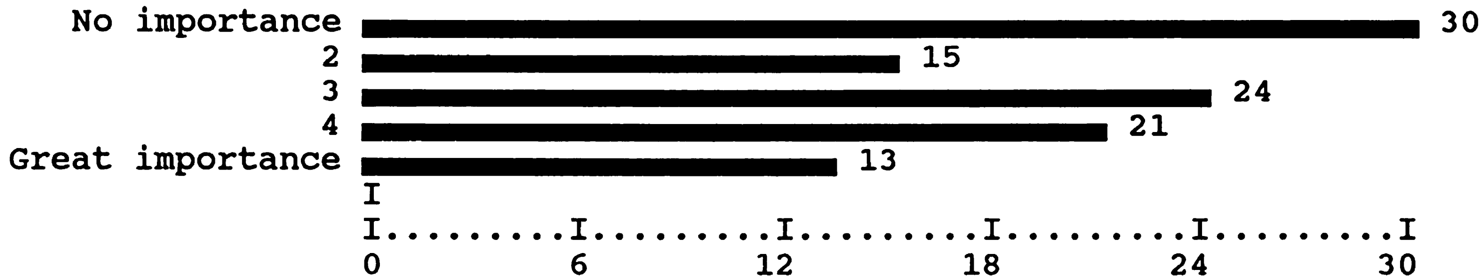


Mean	2.893	Median	3.000	Mode	1.000
Std Dev	1.546	Minimum	1.000	Maximum	5.000

Valid Cases 103 Missing Cases 43

CONTENNS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No importance	1	30	20.5	29.1	29.1
	2	15	10.3	14.6	43.7
	3	24	16.4	23.3	67.0
	4	21	14.4	20.4	87.4
Great importance	5	13	8.9	12.6	100.0
	.	43	29.5	MISSING	
	TOTAL	146	100.0	100.0	

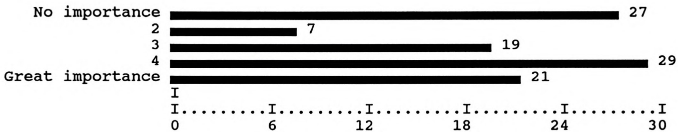


Mean	2.728	Median	3.000	Mode	1.000
Std Dev	1.402	Minimum	1.000	Maximum	5.000

Valid Cases 103 Missing Cases 43

PREFERNS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No importance	1	27	18.5	26.2	26.2
	2	7	4.8	6.8	33.0
	3	19	13.0	18.4	51.5
	4	29	19.9	28.2	79.6
Great importance	5	21	14.4	20.4	100.0
	.	43	29.5	MISSING	
	TOTAL	146	100.0	100.0	

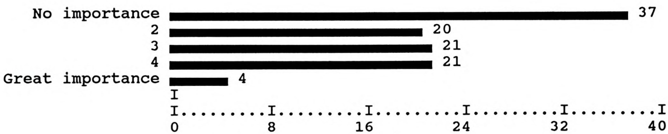


Mean	3.097	Median	3.000	Mode	4.000
Std Dev	1.492	Minimum	1.000	Maximum	5.000

Valid Cases 103 Missing Cases 43

SCHEDNS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No importance	1	37	25.3	35.9	35.9
	2	20	13.7	19.4	55.3
	3	21	14.4	20.4	75.7
	4	21	14.4	20.4	96.1
Great importance	5	4	2.7	3.9	100.0
	.	43	29.5	MISSING	
	TOTAL	146	100.0	100.0	



Mean	2.369	Median	2.000	Mode	1.000
Std Dev	1.268	Minimum	1.000	Maximum	5.000

Valid Cases 103   Missing Cases 43

BENEFNS

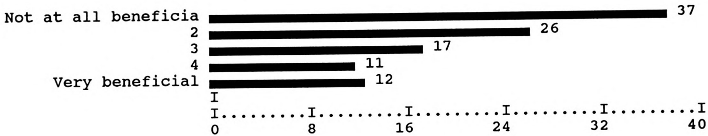
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all beneficia	1	18	12.3	17.5	17.5
	2	13	8.9	12.6	30.1
	3	31	21.2	30.1	60.2
	4	28	19.2	27.2	87.4
Very valuable	5	13	8.9	12.6	100.0
	.	43	29.5	MISSING	
		-------	-------	-------	
	TOTAL	146	100.0	100.0	

Mean	3.049	Median	3.000	Mode	3.000
Std Dev	1.271	Minimum	1.000	Maximum	5.000

Valid Cases	103	Missing Cases	43

MAJBENNS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Not at all beneficia	1	37	25.3	35.9	35.9
	2	26	17.8	25.2	61.2
	3	17	11.6	16.5	77.7
	4	11	7.5	10.7	88.3
Very beneficial	5	12	8.2	11.7	100.0
	.	43	29.5	MISSING	
	TOTAL	146	100.0	100.0	

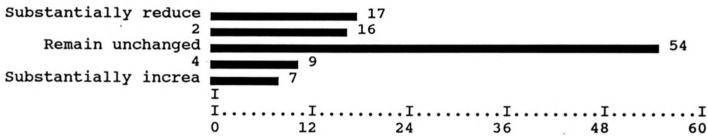


Mean	2.369	Median	2.000	Mode	1.000
Std Dev	1.372	Minimum	1.000	Maximum	5.000

Valid Cases 103 Missing Cases 43

CHANGENS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Substantially reduce	1	17	11.6	16.5	16.5
	2	16	11.0	15.5	32.0
Remain unchanged	3	54	37.0	52.4	84.5
	4	9	6.2	8.7	93.2
Substantially increa	5	7	4.8	6.8	100.0
	.	43	29.5	MISSING	
	TOTAL	146	100.0	100.0	



Mean	2.738	Median	3.000	Mode	3.000
Std Dev	1.057	Minimum	1.000	Maximum	5.000

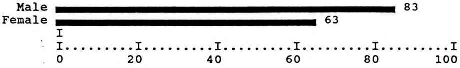
Valid Cases 103 Missing Cases 43

APPENDIX I

DEMOGRAPHIC CHARACTERISTICS OF STUDENT SAMPLE

GENDER

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Male	1	83	56.8	56.8	56.8
Female	2	63	43.2	43.2	100.0
	TOTAL	146	100.0	100.0	



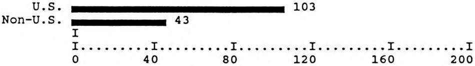
Mean	1.432	Median	1.000	Mode	1.000
Std Dev	.497	Minimum	1.000	Maximum	2.000

Valid Cases 146 Missing Cases 0

- -

HSEDUCAT

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
U.S.	1	103	70.5	70.5	70.5
Non-U.S.	2	43	29.5	29.5	100.0
	TOTAL	146	100.0	100.0	

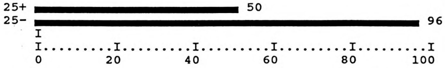


Mean	1.295	Median	1.000	Mode	1.000
Std Dev	.457	Minimum	1.000	Maximum	2.000

Valid Cases 146 Missing Cases 0

AGE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
25+	1	50	34.2	34.2	34.2
25-	2	96	65.8	65.8	100.0
	TOTAL	146	100.0	100.0	

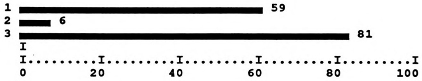


Mean	1.658	Median	2.000	Mode	2.000
Std Dev	.476	Minimum	1.000	Maximum	2.000

Valid Cases 146 Missing Cases 0

TRANTRAN Transfer status

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	59	40.4	40.4	40.4
	2	6	4.1	4.1	44.5
	3	81	55.5	55.5	100.0
	TOTAL	146	100.0	100.0	



MORE

TRANTRAN Transfer status

Mean	2.151	Median	3.000	Mode	3.000
Std Dev	.971	Minimum	1.000	Maximum	3.000

Valid Cases 146 Missing Cases 0

APPENDIX J

APPROVAL BY THE UNIVERSITY COMMITTEE ON RESEARCH INVOLVING HUMAN SUBJECTS

MICHIGAN STATE UNIVERSITY

OFFICE OF VICE PRESIDENT FOR RESEARCH
AND DEAN OF THE GRADUATE SCHOOL

EAST LANSING • MICHIGAN • 48824-1046

August 14, 1991

Bruce Harger
Department of Business/Economics
Lake Superior State University
Sault Ste. Marie, MI 49783

RE: COURSE SELECTION IN GENERAL EDUCATION , IRB#91-258

Dear Mr. Harger:

The above project is exempt from full UCRIHS review. The proposed research protocol has been reviewed by another committee member. The rights and welfare of human subjects appear to be protected and you have approval to conduct the research.

You are reminded that UCRIHS approval is valid for one calendar year. If you plan to continue this project beyond one year, please make provisions for obtaining appropriate UCRIHS approval one month prior to May 29, 1992.

Any changes in procedures involving human subjects must be reviewed by UCRIHS prior to initiation of the change. UCRIHS must also be notifed promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

Thank you for bringing this project to my attention. If I can be of any future help, please do not hesitate to let me know.

Sincerely,

David E. Wright

David E. Wright, Ph.D., Chair
University Committee on Research Involving
Human Subjects (UCRIHS)

DEW/deo

cc: Dr. Marvin Grandstaff

Lake Superior State University

Department of Biology and Chemistry

April 9, 1991

Prof. Bruce Harger, Head
Business & Economics Dept.
Lake Superior State University
Sault Ste. Marie, MI 49783

Dear Bruce:

Based upon your memo of April 8 in which you described your study of general education requirements, I approve the research as Chair of the Institutional Review Board under the expedited review process. If the project is followed as described, it will satisfy the exemption conditions of CFR Part 46, Sect. 46.101, paragraph (b).

Good luck in your research.

Sincerely,

Patrick W. Brown

Patrick W. Brown, Ph.D.
Chairperson
LSSU Institutional Review Board

kp

cc: IRB Members

Sault Sainte Marie, Michigan 49783 (906) 635-2267

LIST OF REFERENCES

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American Council on Education. (1990, September 10). Facts in brief: Most colleges require general education core. Higher Education and National Affairs.

Armour, R. A., & Fuhrmann, B. S. (Eds.). (1989). Integrating liberal learning and professional education. San Francisco: Jossey-Bass.

Association of American Colleges. (1985). Integrity in the college curriculum: A report to the academic community. Washington, DC: Author.

Association of American Colleges. (1988). A new vitality in general education. Washington, DC: Author.

Bloom, A. (1987). The closing of the American mind. New York: Simon & Schuster.

Bok, D. (1986). Higher learning. Cambridge, MA: Harvard University Press.

Boyer, C. M., & Ahlgren, A. (1987). Assessing undergraduates' patterns of credit distribution. Journal of Higher Education, 58(4), 430-442.

Boyer, E. L. (1987). College: The undergraduate experience in America. New York: Harper & Row.

Boyer, E. L. (1990). Scholarship reconsidered: Priorities of the professoriate. Lawrenceville, NJ: Princeton University Press.

Brown, P. A. (Ed.). (1985). General education evaluations. Forum for Liberal Education, 7(5).

Butts, R. F. (1982). The revival of civic learning requires a prescribed curriculum. Liberal Education, 68(4), 377-401.

Campbell, J., & Flynn, T. (1990). Can colleges go back to a core curriculum? Planning for Higher Education, 19(1), 9-16.

Carnegie Foundation for the Advancement of Teaching. (1985). Change trendlines: The liberal arts perspective. Change, 17(4), 31-33.

Carnegie Foundation for the Advancement of Teaching. (1985). Change trendlines: General education--new support growing on campuses. Change, 17(6), 27-30.

Cheney, L. V. (1989). 50 hours--A core curriculum for college students. Washington, DC: National Endowment for the Humanities.

Conner, R. F. (Ed.). (1981). Methodological advances in evaluation research. Beverly Hills, CA: Sage.

Council to Review Undergraduate Education. (1987). Report of the Council to Review Undergraduate Education. Unpublished draft report. East Lansing: Michigan State University.

Etheridge, A. L., & Flynn, P. M. (1987). Defining and developing a general education curriculum: A process for moving the faculty. North Central Association Quarterly, 61(4), 476-480.

Ferris State University. (1990). Outcomes and principles of general education. Unpublished report of the General Education Task Force. Big Rapids, MI: Office of the Dean of Arts and Sciences, Ferris State University.

Fitz-Gibbon, C. T., & Morris, L. L. (1978). How to design a program evaluation. Beverly Hills, CA: Sage.

Florida State Postsecondary Education Planning Commission. (1989). An assessment of the general education curriculum in state universities and community colleges: Report and recommendations of the Postsecondary Education Planning Commission (Report No. 4). Tallahassee: Author.

Gaff, J. G. (1983). General education today: A critical analysis of controversies, practices, and reforms. San Francisco: Jossey-Bass.

Giroux, H. A., Penna, A. N., & Pinar, W. F. (Eds.). (1981). Curriculum and instruction. Berkeley, CA: McCutchan Publishing.

Gordon, R. L. (1980). Interviewing: Strategy, techniques, and tactics. Homewood, IL: Dorsey Press.

Gow, H. B. (1989). The true purpose of education. Phi Delta Kappan, 70(7), 545-546.

Green, T. F. (1982). Evaluating liberal learning: Doubts and explorations. Liberal Education, 68(2), 127-138.

Griffith, C. R. (1947). The changing structure of higher education. Proceedings of the Institute for Administrative Officers of Higher Education, 19, 3-19.

Hall, L. S. (1983). Liberal education: Neither liberal nor an education. Change, 15(4), 9-11.

Hannah, J. A. (1980). A memoir. East Lansing: Michigan State University Press.

Hansen, D. W. (1982). New directions in general education. Journal of General Education, 33(4), 249-262.

Hartwig, F., & Dearing, B. E. (1979). Exploratory data analysis. Beverly Hills, CA: Sage.

Hindern, M. (1984). Bridges: A modest proposal to connect the disciplines. Liberal Education, 70(1), 13-16.

Hinni, J., & Eison, J. (1990). Helping freshman parents see the value of general education courses. Journal of the Freshman Year Experience, 2(2), 89-99.

Hirsch, E. D., Jr. (1988). Cultural literacy. New York: Vintage Books.

Johnson County Community College. (1989). Creating an alternative general education core curriculum. Overland Park, KS: Author. (ERIC Document Reproduction Service No. ED 307 006)

Keller, P. (1982). Getting at the core: Curricular reform at Harvard. Cambridge, MA: Harvard University Press.

Kemmis, S., & Stake, R. (1988). Evaluating curriculum. Geelong, Victoria, Australia: Deakin University Press.

Levine, A. (1990). Curriculi-curricula. Change, 22(2), 46-51.

Mark, M. M., & Romano, J. J. (1982). The freshman seminar program: Experimental evaluation of an introduction to the liberal arts. Evaluation Review, 6(6), 801-810.

Martin, W. B. (1982). Qualities of a college of character. Educational Record, 63(4), 32-38.

Mears, J. A. (1986). Evolutionary process: An organizing principle for general education. The Journal of General Education, 37(4), 313-325.

Michigan Department of Education. (1969). State plan for higher education in Michigan. Lansing: Author.

Miller, G. E. (1988). The meaning of general education: The emergence of a curriculum paradigm. New York: Teachers College Press.

Mohrman, K. (1983, Fall). Liberal learning is a sound human capital investment. Educational Record, pp. 56-61.

Mooney, C. J. (1991, May 8). Professors feel conflict between roles in teaching and research, say students are badly prepared. The Chronicle of Higher Education, pp. 15-17.

Morris, C., Leone, H., & Mannchen, M. (1987). Curricular patterns for students who have experienced the general education reforms at Miami-Dade Community College (Research Report No. 87-13). Miami: Office of Institutional Research, Miami-Dade Community College. (ERIC Document Reproduction Service No. ED 305 126)

Nelson, C. (1990, September). Harvard's hollow "core." The Atlantic Monthly, pp. 70-80.

O'Banion, T., & Shaw, R. G. (1982). Obstacles to general education. New Directions for Community Colleges, 10(4), 59-72.

Payne, S. L. (1980). The art of asking questions. Princeton, NJ: Princeton University Press.

Petry, J. R. (1987). The revival of general education programs in American colleges and universities. Paper presented at the annual meeting of the American Educational Studies Association, Chicago, IL. (ERIC Document Reproduction Service No. ED 288 439)

Putnam, B. H., & Stevens, E. I. (1991, July 24). Management as a liberal art. The Chronicle of Higher Education, pp. 81-82.

Raines, M. R., Grandstaff, M. E., & Hekhuis, L. F. (1989). Thinking together about the new century in Michigan higher education. East Lansing: College of Education, Michigan State University.

Reardon, R. C. (1990). The demand side of general education: A review of the literature (Technical Report No. 11). (ERIC Document Reproduction Service No. ED 323 861)

Sederburg, W. (1989). Results of the 1989 Michigan public higher education faculty survey. Lansing, MI: Author.

Smith, J. Z. (1983). Why the college major? Questioning the great unexplained aspect of undergraduate education. Change, 15(5), 12-15.

Sprinthall, R. C. (1987). Basic statistical analysis (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Stark, J. S., & Lowther, M. A. (1989). Exploring common ground in liberal and professional education. New Directions for Teaching and Learning, 40, 7-20.

Suskie, L. M. (1983). Student patterns in completing general education requirements. (ERIC Document Reproduction Service No. ED 239 572)

Sworder, S. (1986). Determination of student willingness to take afternoon classes and class time preference. (ERIC Document Reproduction Service No. ED 269 047)

Weaver, F. S. (1982). Introductory statistics and general education. Journal of General Education, 33(4), 287-294.

Wee, D. L. (1987). Getting out of the way of general education. North Central Association Quarterly, 61(4), 454-460.

Woditsch, G. A., Schlesinger, M. A., & Giardina, R. C. (1987). The skillful baccalaureate. Change, 19(6), 48-57.