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ON ACHIEVEMENT IN GENERAL PSYCHOLOGY AT IOWA
CENTRAL COMMUNITY COLLEGE.

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EVALUATION OF EXPERIMENTAL METHODS OF TEACHING

ON ACHIEVEMENT IN GENERAL PSYCHOLOGY AT

IOWA CENTRAL COMMUNITY COLLEGE

by

Prem Nath Sahai

A Dissertation Submitted to the

Graduate Faculty in Partial Fulfillment of

The Requirements for the Degree of

DOCTOR OF PHILOSOPHY

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In Charge of Major Work

Head of Major Area

Dean of Graduate College

Iowa State University
Ames, Iowa

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INTRODUCTION

The history of mankind has continuously evidenced the need
for lengthening the period of minimum education for its
children. Early settlers in the 16th century in the United
States considered six to eight years' education as the minimum
for their children. In the 19th century, the local communities
felt the pressures of advancing culture. Twelve-year high
school education became an aspiration for the local communities.
In the first half of the 20th century, high school education
reached the stage of minimum level of education.

Complexities of the modern world and affluence in the
society prompted a greater desire for education beyond high
school. This resulted in the establishment of a number of
universities and four-year colleges all over the country.
The Morril Act of land grant colleges in 1862 was a great step
forward for propagation of education. Their growth and influ-
ence in the communities, through extension education, enhanced
the growing need of minimum education for future generations.
In 1902, the first junior college was established. In the
1920's, local communities began to establish their own junior
colleges to provide two years of education beyond high school.

Educational Policies Commission of the National Education
Association (7) recommended in 1964 the universal opportunity
for education beyond the high school. The publication stated
in the foreword:

"That every American should receive education through
the high school has long been a national goal. In
this regard, the United States has been pacesetter
for the world. Yet, as America approaches this goal,
it becomes apparent that it is not enough to meet
present and future demands. The Educational Policies
Commission proposes that the nation now raise its
sights to make available at least two years further
education, aimed primarily at intellectual growth,
for all high school graduates."

In proposing the accessibility of the universal two years'

education beyond the high school, the Commission proposed:

"Nonselective colleges should exist in every popula-
tion center, and they should expand their range
beyond their immediate environs through radio, tele-
vision, self-teaching devices, extension programs,
and correspondence courses."

Morrison and Witherspoon (17) reported in 1966 the follow-

ing changes in junior college enrollments throughout the

country:

"Junior colleges have increased greatly in number and in
enrollment size since the beginning of this century
when there were eight junior colleges which enrolled
a total of 100 students. By 1950 the number of junior
colleges had increased to 506 and to 593 by 1960. The
644 junior colleges in 1963 represented a 9 percent
increase in the number of junior colleges in the pre-
ceding three years. One of six students enrolled in
institutions of higher education in the fall of 1963
was enrolled in a junior college. Publicly supported
junior colleges enrolled 90 percent of all junior
college students."

Total enrollment of two-year institutions in the United

States in 1967 was 1,518,079 (22, p. 301).

Presently, several states such as California, Florida, and

New York have systems where the junior colleges serve as feeder

institutions to the larger state universities. Starrak and

Hughes (27) stated that in Iowa the major objective of the

junior colleges has been to make it conveniently possible for the college bound students to remain at home while completing the first one or two years of a regular degree curriculum.

Junior colleges are being replaced by comprehensive community colleges. This is relatively a new concept of comprehensive post-high school education for two years. Its purpose is to meet the educational needs of the people of the community. These needs result from the growth of functional illiteracy of adults in all walks of life, increased demand for college education, need for terminal education of noncollege bound younger population, and the urge for self-actualization of the grown-ups. The importance of its role increased due to a growing demand of professional education and graduate study programs at the university level.

Another research study reported in the Phi Delta Kappan Journal of February, 1970 (21) estimated an increased demand of 2,388 full-time instructors in the area of general subjects and 2,200 in the area of technological subjects during the year 1969-70 over the year 1968-69.

As early as 1956, Conant (4) advocated the development of a strong force in the two-year colleges. Emphasizing the role of the two-year colleges, he said,

> "For those whose interests are focused on the education of all our future citizens, irrespective of their vocations, the proposal to channel a large proportion of high school graduates into local colleges instead of publicly supported universities also has much to recommend it. First, because a local two-year college can often take care of a boy

or girl looking for a short general education better
than a university. The combination of vocational
training and general studies offered may yield
results more lasting than exposure to instruction in
enormous classes in a University. Psychologically,
there are often great advantages in being in a
smaller and more familiar group. Second, because
there is a certain relation between the expansion of
our state universities and the type of education
offered to all the youth of the state in the high
school. The taxpayer's money supports public educa-
tion at all levels. . . . And it is clear that two-
year colleges are a far less expensive form of
advanced education than that provided by a university,
unless the university is doing a wretched job for its
freshmen and sophomore classes."

Community College Growth In Iowa

Growth of the community colleges is evidenced by the
yearly increase in enrollment of the students in these colleges.
A report of the Iowa State Department of Public Instruction (12)
indicated that the enrollment of students in the junior colleges
in Iowa had continuously been rising in the 1950's and 1960's.
During a period of sixteen years, from 1953 to 1969, the
increase was more than 1,160 percent. The data in Table 1
indicate the increase. This table was constructed from the
information furnished by the Iowa State Department of Public
Instruction.[1]

On the three campuses of the Iowa Central Community
College, the increase was more than 10 percent in one year,
from 1,875 in 1968-69 to 2,071 in 1969-70.

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[1]Moench, Charles R., Department of Public Instruction,
State of Iowa. Letter in response to inquiry. Private com-
munication. January 28, 1970.

Table 1. Enrollment of full-time community college students
          1953-1969

Year	Total enrollment
1953-54	1,457
1955-56	2,332
1957-58	2,677
1959-60	2,783
1961-62	3,511
1963-64	4,752
1965-66	8,468
1967-68	13,497
1969-70	18,427

Today the two-year colleges are playing a unique role in the field of education. Erickson (8) wrote about the two-year college:

> "The American two-year junior college was a unique invention adapted from the land-grant college idea, which brought with it the introduction of the new degree, associate in arts. The junior college idea has flowered--our open-door, comprehensive junior colleges have a wide selection of offerings leading both to transfer to the university and to employment in business, technology, health sciences, and public service."

The wide variety of the needs of the increased enrollment at the community college was reflected in the increasing number of course offerings at the various community colleges in Iowa. At the Iowa Central Community College, Webster City, Iowa the

number of course offerings rose from 79 in 1966-67 to 108 in 1969-70.

Rationale for the Study

To fulfill the specific needs of the student population, the community colleges have started evening classes on-and-off campus, like the universities. The difference between universities and community colleges is that the former have tried to develop graduate level courses to serve the needs of education for professional growth. Whereas the community colleges are trying to offer courses at the undergraduate level for all types of students.

A survey of the students in the Iowa Central Community College indicated that the students take advantage of the open-door policy of the community colleges. The high school ranks for these students range from the lowest decile to uppermost decile. The composite scores on the American College Testing Program tests, referred to as A.C.T. tests henceforth, ranged from eight to 30 with a mean ranging from 19.39 to 21.69 during the years 1967-69. These scores were lower than the scores of their counterparts in the three state institutions of higher learning in Iowa. All the state institutions of higher learning generally admit students from the upper half of the graduating class of the high schools. The average A.C.T. scores reported for the 1966-67 year freshmen were 24.24, 22.50, and 20.81 for the State University of Iowa, Iowa State

University, and the University of Northern Iowa as compared to an average of 19.43 of the Iowa Central Community College. All these figures were taken from student profiles of the Iowa Central Community College for three years.

Several educators have gathered subjective information and expressed their opinions about the off-campus and on-campus evening courses. Conant (5) made a similar study in the course of his journey around the country. He especially commented about extension courses offered off-campus, saying,

> "However, within the profession the suspicion is rife
> that some, if not many, of them are far below stand-
> ard. And because of this suspicion, I suppose, the
> number of credits, out of a total of 30 toward a
> master's degree, that can be 'rung up' by taking
> extension courses is commonly limited to about eight.
> There is often, however, no limit to the number of
> extension courses that can be counted toward an
> increase in pay."

In conclusion, he recommended for on-campus and off-campus courses, both, "No credit toward the degree should be given for extension course or courses taken on campus while the teacher is engaged on a full-time teaching job."

Sheats (24) has stated that,

> ". . . there would be general agreement, in principle,
> that university extension activities should reflect
> the kind of qualitative standards which characterize
> on-campus teaching and research activities."

Research findings, as cited by Bail et al. (2), support this viewpoint. Price (20) found that, in general, the ability levels of on-campus and off-campus groups were comparable. Marcus (13) found that on-campus and off-campus courses

differed little in terms of marks, difficulty of work, or test-
ing. Moore (15) discovered that instructors of graduate
extension classes rated their students as highly as on-campus
students in the quality of work done. Indeed, one study found
that extension students did significantly better than on-campus
students on tests of vocabulary and level of comprehension.

In brief, the importance of the role of the community
college can be emphasized due to the following factors:

1. Open-door policy resulting in increasing enrollments.

2. Wide variety of course offerings to satisfy the
specific needs--education for terminal, continued, vocational
and technical, and transfer programs of their student popu-
lation.

These virtues of the community college make the task of
the instructor more complex. They are confronted with the
problems of:

a. Maintenance of academic standards to compare favorably
with their counterparts in the academically-oriented insti-
tutions of higher learning, satisfying the needs of transfer
students.

b. Serving the needs of semi-professional groups compris-
ing most of the vocational-technical programs.

c. Satisfying the desire for self-improvement of those
who seek continued education.

d. Meeting the challenge of terminal students who like to
try for an opportunity of post-high school education.

The present investigator had an opportunity to teach a course in general psychology at the Iowa Central Community College, Webster City, Iowa scheduled during the day for three days a week and an on-campus night course for one night a week. Both the classes carried an equal credit of three semester hours.

This investigator considered it beneficial in the interests of the standards of education imparted in the community colleges to investigate the effects on the achievement of students in two types of classroom structure: one, three one-hour classes three days a week; and the other, a one-night-a-week three-hour class in general psychology.

Past subjective experiences of the investigator in a high school general psychology class seemed to indicate that the students favored teaching and testing by chapters of the text-book rather than by the units. It was, therefore, decided to determine the effectiveness, as measured by student achievement, of the types of course organization--by units and by chapters.

Statement of the Problem

Iowa Central Community College, Webster City, Iowa first offered night classes for credit courses in the spring of 1968. One of the courses, general psychology, was taught by the investigator. It was the purpose of this investigation to compare the achievement of the students taught in two types of class structure--one three-hour class taught one night a week

and three one-hour classes taught three days a week. Also planned within this investigation was the study of the effects of the two types of course structure: one, teaching and testing by chapters; and the other, teaching and testing by the units given in the textbook.

Hypotheses

The following hypotheses were postulated:

1. There is no difference in the educational background of different groups of students as measured by a) high school percentile ranks and b) composite scores on test of A.C.T. program.

The following specific hypotheses were stated:

(i) There is no difference between the students in the two types of class structure on the basis of the mean high school percentile ranks.

(ii) There is no difference between the students in the two methods of course organization on the basis of their mean high school percentile ranks.

(iii) There is no difference between males and females on the basis of their mean high school percentile ranks.

(iv) There is no difference between the students of two types of class structure as measured by the mean A.C.T. composite scores.

(v) There is no difference between the students of two methods of course organization as measured by their mean A.C.T. composite scores.

(vi) There is no difference between boys and girls as measured by their composite scores on the A.C.T. test.

2. There is no difference in the academic achievement of the students in the general psychology course who have had a general psychology course in high school or any other psychology course prior to taking the general psychology course at the Iowa Central Community College and those who did not have one.

3. There is no difference in the academic achievement in general psychology in college among the students grouped into four categories according to outside work load to earn money and to maintain a family in case of married women.

4. There is no difference in the academic achievement of the students taught under two types of class structure: first, teaching three one-hour classes three days a week; and the second, teaching one three-hour class one night a week.

5. There is no difference in the academic achievement of the students taught under the two methods of course organization: first, one-chapter teaching and testing; and the second, teaching and testing by units.

6. There is no difference in content retention by students taught in two types of class structure, as measured by the achievement on the semester test.

7. There is no difference in the content retention by students taught in two methods of course organization, as measured by the achievement on the semester tests.

8. There is no difference in the achievement in general psychology of the students grouped according to academic loads: 16 semester hours or more; 13 to 15 semester hours; and 12 or less semester hours during the semester they took general psychology.

9. There is no difference in achievement of students taught through self-study of Chapter 14 and through a combination of classroom discussions and self-study of 18 chapters.

10. There is no difference in the learning of assigned units of the general psychology as measured by the average achievement of students when units are compared with one another in the second method of course organization--teaching and testing by units of the textbook in the course (general form).

Six units were involved in this comparison. Thus the hypothesis was subdivided into 15 sections to determine the differences in learning among different units, as measured by the achievement on tests for these units (specific hypotheses tested).

(i) There is no difference between the achievement in Unit 1 and Unit 2 of the general psychology.

(ii) There is no difference between the achievement in Unit 1 and Unit 3 of the general psychology.

(iii) There is no difference between the achievement in Unit 1 and Unit 4 of the general psychology.

(iv) There is no difference between the achievement in Unit 1 and Unit 5 of the general psychology.

(v) There is no difference between the achievement in Unit 1 and Unit 6 of the general psychology.

(vi) There is no difference between the achievement in Unit 2 and Unit 3 of the general psychology.

(vii) There is no difference between the achievement in Unit 2 and Unit 4 of the general psychology.

(viii) There is no difference between the achievement in Unit 2 and Unit 5 of the general psychology.

(ix) There is no difference between the achievement in Unit 2 and Unit 6 of the general psychology.

(x) There is no difference between the achievement in Unit 3 and Unit 4 of the general psychology.

(xi) There is no difference between the achievement in Unit 3 and Unit 5 of the general psychology.

(xii) There is no difference between the achievement in Unit 3 and Unit 6 of the general psychology.

(xiii) There is no difference between the achievement in Unit 4 and Unit 5 of the general psychology.

(xiv) There is no difference between the achievement in Unit 4 and Unit 6 of the general psychology.

(xv) There is no difference between the achievement in Unit 5 and Unit 6 of the general psychology.

11. There is no difference in the achievement in general psychology among the four groups of students when classified by college credits earned: 46 semester hours or more; 31 to 45 semester hours; 16 to 30 semester hours; and 15 or less semester hours prior to taking the general psychology course.

12. There is no difference in the achievement of the students in general psychology classified by the chronological age, measured to the nearest whole year at the beginning of the semester.

13. There is no difference in the learning between the two sexes as measured by the total performance on the tests in general psychology.

14. There is no relationship between the high school percentile ranks and the achievement in the general psychology course.

15. There is no relationship between the composite scores on the A.C.T. tests taken by the students and the achievement in the general psychology course.

16. There is no relationship between the students' achievement in general psychology and the evaluation of the teacher by the students.

REVIEW OF THE RELATED RESEARCH

The growth of the two-year community college and the role played by its comprehensive nature has helped it get a separate identity in the education system of the country. Researchers have begun to investigate its effectiveness and experiment with different methods and organizational structures. Up to 1967, especially in Iowa, these colleges were run by the local school systems. In most colleges, the teaching staff and the buildings were shared with the local high schools. Three-hour evening classes at the two-year colleges were planned by the institutions of higher learning as their extension courses. Most of these courses were oriented toward the in-service education of teachers. Thus research had been restricted to the investigation of effectiveness of such extension courses by the university.

Sheats (24) summed up his review of the research about extension education, saying,

> "It is appropriate to point out that organized research
> into the problems and assumptions implicit in the role
> of university extension in the total adult education
> effort of this country is of extremely recent vintage
> and still woefully inadequate. . . . But it is safe to
> assert that the forgotten child of educational research
> in the United States is what some educators term the
> fourth level of our educational system—adult education."

The Clearing House on Higher Education[1] and other

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[1] Sumner, David E., Clearing House on Higher Education, Educational Resources Information Center, The George Washington University, Washington, D.C. Letter in response to inquiry. Private communication. January 2, 1970.

departments of the Educational Resources Information Center
were contacted. Only two research references could be located
with their help.

Growth of Extension Courses

Farnum (9) determined several factors for the growth of
extension courses:

> "There are several factors which have initiated this
> trend and which may cause it to continue to expand
> and spread throughout the educational hierarchy. The
> first factor is the greater weight being placed on
> education by the general public. Second is industry's
> emphasis on higher educational requirements for both
> initial selection and promotion of employees. Related
> to this is the necessity for increased technical
> training brought about by the complexity of recent
> technological developments in industry. A third fac-
> tor related to the increasing interest in adult edu-
> cation is the increasing age level of the general
> population. Many retired individuals or individuals
> approaching retirement are enrolling in courses
> either to train themselves for a new field of work or
> for cultural and avocational purposes. A fourth
> factor which will lead to the expansion of college
> and university adult education classes is the expected
> tidal wave of students applying for admission to
> college starting in 1958. It is expected that college
> enrollments will increase from a current enrollment
> figure of 2,629,293 students to 3,338,656 by 1960 and
> 4,382,082 by 1965. It is a generally accepted fact
> among college administrators that due to limited
> facilities many students who are capable of doing
> college level work will be unable to gain admission.
> It is to be expected that many of these students will
> enroll in college or university extension programs.
> Some institutions will set up formal degree programs
> for these students in extension centers where they
> may take one or two years of work toward their
> bachelor's degree, while others may not make formal
> programs available but the students may take courses
> which will carry credit toward a degree when they do
> matriculate in a full-time status."

Farnum's predictions for growth of college enrollments
were confirmed by the actual enrollment figures in 1967. It

was 6,963,687 for all post-high school institutions in the States (22, p. 289). Total estimated in 1969 was 7,100,000 (10, p. 660). Pickett (18) explored the emphases, practices, problems, and issues at six private universities about their evening programs in teacher education. He found the most frequently mentioned problem was that the evening students did not seem to perform as well academically nor did they seem to obtain as good academic programs as did their day-divisions counterparts.

On-and-Off Campus Course Comparisons

In his comparison of the academic aptitude of the university extension degree students and campus students, Farnum (9) reported

> ". . . that those extension students working toward a college degree have as much aptitude for college work as campus students and in some specialized areas, may have some advantage over campus students. Hence, taking into consideration the level of ability of extension students plus their strong motivation to learn, it follows that they should be able to do college level work, and they should be entitled to receive college credit for that work. . . . No significant difference was found between the mean scores of the two groups for the total score on the ACT test."

Bridgman and Dysinger (3) measured the final examination performance of correspondence and resident students in an introductory course in psychology. No significant difference in achievement was noted.

Pressey and Kinzer (19), as reported by Anderson et al., differentiated between the high school students and the college

freshmen in their learning of the same material from an educational psychology course. They have, evidently, not taken into consideration some of the other factors like work pressures, academic work load, and courses previously taken in the field of psychology. Obviously, it is safe to assume that the college students are under different pressures than the high school students, resulting in differences of motivational involvement in the learning of material in any course. It would seem to be probably more so in the field of educational psychology because, at the college level, only those students usually take this course who plan to go into the teaching profession. Whereas at the high school level, involvement in an experiment like this would appear more to be for reasons other than the learning of the material. Further, students at the college level are generally assumed to have taken a course in general psychology prior to their taking a course in educational psychology. High school students are generally not offered an opportunity to take a course in general psychology. Pressey and Kinzer do not seem to have recognized this fact when they compared the achievement and retention of the two groups of students.

Ball, Treffinger and Ripple (2) researched student performance in on-campus and off-campus educational psychology classes. This project aimed at investigating differences between an on-campus course and two off-campus courses. The authors have pointed out that this was an exploratory study

with several limitations. One of the main limitations was that this project did not take into consideration the academic work load of the students who were involved in it. The authors have brought this out specifically in their discussion. They have stated:

> "It seems logical that there would be substantial moti-
> vational differences between regular and extramural
> classes: for those in the on-campus setting, the
> class is usually the primary occupation; for those in
> extramural classes, it is not. Consider the teacher
> with a family, taking extramural courses for credit
> towards a master's degree and, at least partially, for
> later financial gain. After working hard all day and
> incurring the everyday problems of teaching and rais-
> ing family, it is probably unreasonable to expect this
> teacher and part-time student to be able to compete
> academically with the full-time student. It is in the
> best interests of the full-time student to maintain
> the best possible grades for optimal future employment;
> the standards for extension students, who are already
> employed, are not nearly so exacting. Also, the full-
> time student has the advantage of many interrelated
> courses to aid continuity and retention. It is likely
> that the extramural student has neither as much
> inclination nor (more importantly) as much time to
> study the material as does the full-time student."

Prediction of Academic Achievement

Marshall (14) investigated noncognitive variables as a predictor of academic achievement for freshmen, sophomores, and juniors at Abilene Christian College. His investigation revealed that:

1. The cognitive variable which had the highest corre-
lation coefficient with actual student grade-point average was High School Grade-Point Average.

2. Noncognitive variables do not correlate as closely with actual student grade-point average as do cognitive variables.

3. Selected noncognitive variables combined with selected cognitive variables and correlated with actual student grade-point average can increase correlation.

Stough (29) analyzed selected factors as predictors of success in Vocational Industrial Certification Courses. His study revealed that:

> "1. The high school achievement, measures of intelligence, and reading ability have been the most consistent predictors of achievement at the college level. The students entering the vocational industrial certification programs are usually between twenty and fifty-five years of age with varied experience since graduation from high school; therefore, high school achievement was not considered appropriate as a predictor for this population.
> 2. Two hundred fifteen non-degree students from six location groups were tested: 89 of the students were beginning the certification program, and 126 of the students had completed at least two-thirds of the certification program.
> 3. There were no significant differences found between the scores of the beginning students and those of the finishing students."

A review of research studies by Stough (29) indicated that the optimum combination of predictors is most frequently attained through multiple correlation analyses. The multiple correlation technique was, therefore, adopted for the study. The five part-test scores were used as the predictor variables for the grade-point average. The multiple correlation analysis of the combined populations in the study indicated that the most appropriate equation for predicting success in the

vocational industrial certification courses with the scores

from the tests used in his study would be:

Grade point estimate = 1.15474 + .00668 ("Vocabulary"

score) + .02327 ("The World Around You" score) + .00832 ("Read-

ing Comprehension" score). The Multiple R obtained with these

three predictors was .64465. The other two predictors,

"Reasoning" and "Reading Rate" scores, increased the cumulative

standard error of estimate but did not add significantly to the

Multiple R.

Spector (26) analyzed certain characteristics and the

educational success of the junior college freshmen. He found:

> "1. Students of nearly all ages and from all
> socio-economic status levels enrolled in the junior
> college. The eighteen year old student comprised
> 51 percent of the entering freshmen and this age
> group represented 57 percent of the educationally
> successful students at the end of four semesters.
> Sixty-eight percent of the freshmen were from
> middle-class socio-economic backgrounds.
> 2. Aptitude scores and performance level of
> students admitted to college varied through approxi-
> mately the entire percentile range, so too did the
> range of scores of the educationally successful
> students at every semester interval.
> 3. Students who attended college immediately
> after high school had a significantly better
> probability of educational success than did students
> who delayed their college entrance.
> 4. The high school rank in class of the stu-
> dent was the best single indicator of college per-
> formance. A correlation of .55 was attained between
> high school rank in class and grade point average
> for all successful students at the end of four
> semesters. Multiple correlation coefficients as
> high as .80 were attained."

Morgenfeld (16) found that the adjusted high school grade

average has been the best single predictor of college success.

In his study, adjustments were made to correct for differences
in grading standards. Those used were two statistical methods
for adjusting high school grades as presented by B. S. Bloom
and F. R. Peters in their book, The Use of Academic Prediction
Scales, published in 1961. He found the correlation of .54
for scaled values using internal method. This was statisti-
cally significantly better than the correlation of .47 with the
unscaled values. The other method of aptitude resulted in
slightly lower correlation of .44.

Differentiated Class Size

Stephens (28) studied the effects of differential class
size in a college course. Small size classes had 35 to 36
students, medium-sized classes had 76 to 78 students, and
large-sized classes had 189 students. The large-sized class
had small discussion groups ranging in size from eight to 23
students.

Major findings of the study were:

"1. On a measure of attitudes toward the teaching
profession the medium-sized classes had the highest
mean score; the small classes had the next highest
mean score; and the large class had the lowest mean
score. The difference among mean scores for the groups
is statistically significant (P = .01).
2. On a measure of acquisition of functional
information and understandings, the large group had the
highest mean score; the medium-sized groups had the
next highest mean score; and the small groups had the
lowest mean score. The difference among mean scores
for the groups was statistically significant (P = .01).
Also the large class proved superior on the same
measure for upper ability and lower ability students
and for upper division and lower division students."

Corey (6) investigated the outcomes of the introductory psychology course in a junior college. In the investigation, five basic groups were involved in the research design including: small discussion, small lecture, large lecture taught by the investigator, large lecture taught by another instructor, and a group of college students who had not taken Introductory Psychology. . . . Between in group comparisons were made to determine the effect of method, class size, teacher difference, and psychology versus no psychology, upon students' attitudes and adjustment. In general, there were no differences between the groups on the variables studied with the exception that the psychology groups improved their personal adjustment to a greater degree than did the nonpsychology group.

Enrollments in colleges and the evening course offerings in the institutions for post-high school education have increased every year. Evening courses have become more popular and gained more importance. These have created many types of problems, especially for the community college instructors. Several studies seemed to support the evidence that there was no significant difference in achievement between the full-time day students and the students attending evening and extension courses.

Almost all studies were unanimous in their finding that the high school grades or ranks were the best single predictor for academic achievement in college. The differentiated class size showed some effects on the achievement of selected groups

of students. Most of the research centered on the problems
confronting the universities and four-year colleges. The
unique problems of the comprehensive community colleges have
begun to attract the attention of the researchers.

METHOD OF PROCEDURE

The investigator taught an introductory course in general psychology at the Iowa Central Community College for three semesters--fall and spring 1968-69 and fall of 1969-70. In the fall of 1968-69, referred to as the first method later, the whole course was divided into chapters as given in the text-book, Introduction to Psychology, by Ernest R. Hilgard and Richard C. Atkinson, 4th edition. Each chapter was taught individually and the tests given after each chapter for the first 19 chapters. Tests over Chapters 20 through 24 were included in the semester test. Students' scores on the chapter, unit or the semester tests were interpreted as their achievement in general psychology.

In the spring of 1969 and fall of 1969-70, the course was divided into eight units as given in the text. These units included two to five chapters each. Teaching corresponded to the units, and tests were given at the completion of each unit for the first six units. But the seventh and eighth units covering Chapters 20 through 24 were included in the semester test. This method will be referred to as the second method henceforth.

In this study, day students always took their test at least two days after the study of their chapter or unit. In the case of the night students, they took their tests either immediately after the complete study of the chapter or the unit

or a week later. Thus, basically, there did exist a difference in the time lag between the two groups.

Roden'cle and Anderson (23) have pointed out that there was a smaller decrement over the retention on multiple-choice items with delayed testing situation where the delay was from six to nine days in the completion of the reading material and the testing situation. In the present study this factor could not be and was not controlled for the reasons that the normalcy of the classroom instruction environment would have been lost and the timings could not be controlled. Moreover, the effects of this could be eliminated in the comparisons of the results on the semester test because both the groups would have had almost equal time lag between the time of material studied and the semester test. The semester test included equal numbers of test items from each chapter of the textbook.

During all three semesters, two types of class organization were used: first, three one-hour classes three days a week; and second, one three-hour class one night a week. Both types of classes were taught on the campus and carried an equal college transfer credit of three semester hours. Three one-hour classes and one three-hour class will be referred to as day and night classes, respectively, hereafter.

Originally the study was planned for only two semesters. Since only 39 students enrolled in the second semester, and only eleven in the night classes, it was decided to continue

the project for the third semester. The same course organization was used in the third semester as in the second.

Students of all three semesters enrolled in the day or night classes according to their own convenience of scheduling. This was done to have a natural setting for the project, rather than influencing it by any external controls. To eliminate any chance of the Hawthorne Effect, at no stage during the semester were the students told that an experiment was being performed to compare two types of course organization or class structure.

Total number of students enrolled in the beginning of the three semesters was 138.

Table 2. Number of students included in the study by course organization and class structure

Course organization	Class structure		
	Day	Night	Total
First method	28	18	46
Second method	59	22	81
Total	87	40	127

Preliminary statistical analysis was done at the end of the first semester. The calculated correlations seemed high enough to encourage the continuation of the project.

During the three semesters, the investigator made a concerted effort to use the same test materials, audio-visual aids, notes and discussion topics. Tests used were those supplied by the textbook publisher. This was done to save the time and effort in their construction, validation, and reliability testing. Time allotted for all the tests was in proportion to the number of test items on each test. Generally, two minutes were allotted for every three test items. Every test item had four responses. This did require lengthening of the class time of the one-hour day classes by a few minutes in a few situations. All students had ample time to complete the test. All the tests were reviewed in the class after the test was checked and graded. This was invariably done in the following week in the case of the night class students. The semester test consisted of five selected items from each chapter.

Data concerning the age, A.C.T. scores, high school ranks, college grade point, and the students' academic classification were obtained from the counselor of Iowa Central Community College, Webster City, Iowa. Other information such as grades given by the students to the instructor, number of hours worked for pay, and previous psychology course taken, was obtained from the students by means of a questionnaire. It may be mentioned that different instructors at the Iowa Central Community College use their own course evaluation sheets and other questionnaires for gathering desired information. As such, the

use of questionnaires for grading the course and instructor was
not new or novel for this investigation. Questionnaires used
by the present investigator are given in the Appendix.

Four of the students had not taken the tests of the A.C.T.
program. High school ranks were not available for three
students. For the purposes of this study, missing data for
these students were assigned by allotting average A.C.T. scores
and average high school ranks, as determined by the trial cal-
culations for the first semester.

There were only four students who had been enrolled for
11 or fewer hours of college credit in the three semesters of
the study of this class. It was, therefore, decided to divide
the students into three categories for comparisons according to
the academic load; namely, 16 or more; 13 to 15; and 12 or less
semester hours of academic load. Similarly, there were only
five students of 22 years of age or more. They were included
in the group of students of age 21 years. This resulted in
four classifications for maturity levels according to chrono-
logical age; i.e., 18, 19, 20, and 21 or more years of age.

Statistical Techniques

The students at the Iowa Central Community College came
from numerous high school systems. Thus, one way that was
considered suitable was to convert their high school ranks
into percentile ranks. The initial differences among dif-
ferent groups of students were then figured out by computing

the average percentile ranks and their standard deviations for the groups.

Standard statistical techniques developed into computerized programs by the Statistical Data Processing Service of the Iowa State University were used for analysis of the data. Formulas used were for student "t" statistics for correlated samples, regression analyses, the analyses of variance (factorial analyses), correlation matrix as used by Snedecor and Cochran (25) and a linear regression model building system as given in the Mouflon Reference Manual (11). The author was aware that the procedure of using "t" statistics for correlated samples could lead to a larger number of significant "t" values than some of the other procedures available.

Six independent variables--sex, college classification based on educational standing, high school percentile ranks, A.C.T. composite scores, outside work load, and college grade point average--were selected to build a model for prediction of achievement of total scores in general psychology. Two methods tried for this were Stepwise Regression and Hocking and Leslie's Use of the C_p Statistic. These methods are described in the Mouflon Reference Manual (11, pp. 3-11).

To test Hypothesis 9, comparing self-study and teaching in class, an average score obtained on all the chapters was calculated. Similarly, to compare the achievement in different units taught by the second method, Hypothesis 11, the average score for a chapter was calculated by dividing the score for

the unit by the number of chapters in that unit. For example, Unit 1 had two chapters. The mean score and the standard deviation were calculated after dividing the scores attained in the unit by two.

For comparisons involving total scores in general psychology, the scores obtained on tests for the first 19 chapters by either method and the scores obtained on the semester test were added together.

FINDINGS

The purpose of this study was to compare students' achievement as measured by the semester grades with two different types of class structure in general psychology: first, the teaching of three one-hour classes on three days a week; and the second class structure was a three-hour night class once a week. Also planned was a study of the effects of two methods of course organization in the same classes: one, teaching and testing by chapters of the textbook; and the second, teaching and testing by units of the textbook in general psychology. Further development of the study was to attempt a model for prediction of achievement scores in general psychology.

Various hypotheses that were stated for this study were tested with the use of computerized programs developed by the Statistical Data Processing Service of the Iowa State University.

Hypothesis 1 (1): There was no difference between the students in the two types of class structure on the basis of the mean high school percentile ranks.

Mean scores, standard deviations, and the analysis of variance were presented in Tables 3 and 4. Analysis of the data resulted in an F value of 2.35. This was insufficient to reject the null hypothesis.

<u>Hypothesis 1 (11)</u>:   There was no difference between the students in the two methods of course organization on the basis of their mean high school percentile ranks.

Mean scores, standard deviations, and the analysis of variance were presented in Tables 3 and 5. The hypothesis could not be rejected as the F value was 3.04, not significant at .05 level.

<u>Hypothesis 1 (111)</u>:   There was no difference between males and females on the basis of their mean high school percentile ranks.

Mean scores, standard deviations, and the analysis of variance were recorded in Tables 3 and 6. The F value for this comparison was 35.31, which was highly significant beyond the .01 level. The null hypothesis for this comparison was rejected.

<u>Hypothesis 1 (1v)</u>:   There was no difference between the students of the two types of class structure as measured by the mean A.C.T. composite scores.

Mean scores, standard deviations, and the analysis of variance were recorded in Tables 7 and 8. The F value for this comparison was very low, 0.08. The hypothesis could not, therefore, be rejected.

Table 3. Means and standard deviations of students' high
school percentile ranks by groups

| Groups | High school ranks | | Number of students |
	Mean	Standard deviation	
Class structure			
Day class	52.31	23.82	87
Night class	59.31	23.41	40
Course organization			
First method	59.41	25.78	46
Second method	51.74	22.31	81
Sex			
Male	44.39	21.60	57
Female	66.95	20.51	70
Total for whole class	54.52	23.92	127

Table 4. Analysis of variance of high school ranks by class
structure

Source	df	Sum of squares	Mean sum of squares	F value calcu-lated	Hypothesis
Between class structures	1	1,343.00	1,343.00	2.35	Not rejected
Error	125	71,290.92	570.33		
Total	126	72,633.92			

Table value $F_{(.05)}$ = 3.92   Degrees of freedom = 1,125

Table 5. Analysis of variance of high school ranks by course organization

Source	df	Sum of squares	Mean sum of squares	F value calcu-lated	Hypothesis
Between course org.	1	1,724.80	1,724.80	3.04	Not rejected
Error	125	70,909.12	567.27		
Total	126	72,633.92			

Table value $F_{(.05)}$ = 3.92   Degrees of freedom = (1,125)

Table 6. Analysis of variance of high school ranks by sexes

Source	df	Sum of squares	Mean sum of squares	F value calcu-lated	Hypothesis
Between sexes	1	15,998.24	15,998.24	35.31**	Rejected
Error	125	56,635.68	453.08		
Total	126	72,633.92			

Table value $F_{(.01)}$ = 6.85   Degrees of freedom = 1,125

**Significant at .01 level.

Table 7. Means and standard deviations of A.C.T. scores by groups

| Groups | A.C.T. scores (composite) | | Number of students |
	Mean	Standard deviation	
Class structure			
Day class	20.99	9.34	87
Night class	21.42	4.08	40
Course organization			
First method	21.72	12.02	46
Second method	20.79	4.43	81
Sexes			
Male	21.44	10.07	57
Female	20.74	4.49	70
Total for the class	21.13	8.06	127

Table 8. Analysis of variance of A.C.T. scores by class structure

Source	df	Sum of squares	Mean sum of squares	F value calcu- lated	Hypothesis
Between class structure	1	5.21	5.21	0.08	Not rejected
Error	125	8,250.77	66.01		
Total	126	8,255.98			

Table value $F_{(.05)}$ = 3.92   Degrees of freedom = (1,125)

Table 9. Analysis of variance of A.C.T. scores by course
          organization

Source	df	Sum of squares	Mean sum of squares	F value calculated	Hypothesis
Between course org.	1	25.22	25.22	0.38	Not rejected
Error	125	8,230.76	65.85		
Total	126	8,255.98			

Table value $F_{(.05)}$ = 3.92   Degrees of freedom = (1,125)

Table 10. Analysis of variance of A.C.T. scores by sexes

Source	df	Sum of squares	Mean sum of squares	F value calculated	Hypothesis
Between sexes	1	15.66	15.66	0.24	Not rejected
Error	125	8,240.33	65.92		
Total	126	8,255.98			

Table value $F_{(.05)}$ = 3.92   Degrees of freedom = (1,125)

<u>Hypothesis 1 (v)</u>: There was no difference between the students of two methods of course organization as measured by their mean A.C.T. composite scores.

Mean scores, standard deviations, and the analysis of variance for this hypothesis were presented in Tables 7 and 9. The F value of 0.38 presented insufficient evidence to reject the null hypothesis.

<u>Hypothesis 1 (vi)</u>: There was no difference between boys and girls as measured by their composite scores on the A.C.T. test.

The mean, standard deviation, and analysis of variance of the composite scores on the A.C.T. test for the two sexes were recorded in Tables 7 and 10. Computation of the F value yielded a result of 0.24, which was too low to reject the null hypothesis.

<u>Hypothesis 2</u>: There was no difference in the achievement of the students in the general psychology who have had a general psychology course in high school or any other psychology course prior to taking the general psychology course at the Iowa Central Community College and those who did not have one.

The students were divided into two groups: one, those who had had any course in psychology at high school or in college, before taking a course in general psychology at the college; and the second, those who had not taken any course in psychology before. Means and standard deviations for different groups were given in Table 11. The factorial analysis was given in Table 12. The F value was 0.01. The null hypothesis could not

Table 11. Total scores in general psychology with and without previous psychology course by methods of course organization

Total scores	With previous psychology course			Without previous psychology course			Total for all students
	First method	Second method	Total	First method	Second method	Total	
No. of students	17	29	46	29	52	81	127
Mean	331.65	282.31	300.54	286.59	280.83	286.89	289.28
Standard deviation	87.11	63.15	76.72	89.52	62.06	73.14	74.94

Table 12. Factorial analysis of variance using general psychology scores by methods of course organization and with or without previous psychology course

Source	df	Sum of squares	Mean sum of squares	F value calculated	Hypothesis
Course organization methods	1	617.52	617.52	0.11	
Previous psychology course or not	1	40.97	40.97	0.01	Not rejected
Interaction	1	12,916.57	12,916.57	2.35	
Error	123	677,322.57	5,506.69		

Table value $F_{(.05)}$ = 3.92   Degrees of freedom = (1,123)

be rejected. The interaction F value of 2.35 did show results favoring the students with previous psychology course in the first method of course organization.

The total scores in general psychology were computed by adding scores on all chapter or unit tests during the semester and the semester test. These were defined as their achievement in general psychology.

For some of the following analyses, course organization methods were included as a control type variable or to examine the interaction between methods and another factor. In testing the hypotheses, the additional effect of one factor (adjusted for the other factor in analysis) was the area of interest. For this reason, the general linear model approach was used. Changing the variables in the equation changed the sum of squares due to a given factor. As in multiple regression, the adding and dropping or changing variables resulted in changes in the partial regression coefficients.

Hypothesis 3: There was no difference in the achievement in general psychology in college of students grouped into four categories according to outside work load to earn money and to maintain a family in case of married women.

The students were grouped into four categories: first, with 10 or less hours of average work load; second, with 11 to 20 hours of average work load; third, with 21 to 30 hours; and the fourth, with 31 or more hours of outside work load per week for the semester. Married women were included in the fourth

category. The F value for comparisons of these four groups was 1.70, which was not significant at .05 level of confidence. This resulted in nonrejection of the hypothesis. Data were given in Tables 13 and 14.

Hypothesis 4: There was no difference in the achievement of the students taught under two types of class structure: first, teaching three one-hour classes three days a week; and the second, teaching one three-hour class one night a week.

Hypothesis 5: There was no difference in the academic achievement of the students taught under the two methods of course organization: first, one-chapter teaching and testing; and the second, teaching and testing by units.

These two hypotheses were tested in a factorial analysis to examine the two factors of class structure and course organization and any interaction.

The comparison of the students who studied in one-hour classes for three days a week with the students who studied for three hours at a time for one night a week was made. Looking at the means of the subgroups formed by 2 X 2 analysis with two methods, it was found that the students in the night class in Method I secured the highest average score with greater variance within the group. The F value, 0.02, given by analysis of variance was very low. This resulted in nonrejection of Hypothesis 4.

The total mean scores and the standard deviations for the four subgroups of students formed by the two methods of course

Table 13. Scores in general psychology for students with different outside work loads

Outside work load Hours per week	Both methods	
	Mean scores	Standard deviations
1-10	286.39	77.17
11-20	303.39	73.48
21-30	271.97	71.33
31 or more	318.75	64.64

Table 14. Analysis of variance of total psychology scores by outside work load

Source	df	Sum of squares	Mean sum of squares	F value calcu-lated	Hypothesis
Between work load groups	3	28,354.00	9,451.33	1.70	Not rejected
Error	123	684,818.00	5,567.63		
Total	126	713,172.00			

Table value $F_{(.05)}$ = 2.68   Degrees of freedom = (3,123)

organization and day and night classes showed greater homogeneity between the day and night classes under the second method. The night group of the first method affected the overall results for the first method. The analysis of variance for the comparison of the two methods of course organization showed a high F value of 12.20. The null hypothesis was rejected beyond .01 level of significance. The data were presented in Tables 15 and 16.

Means, standard deviations and the analysis of variance were computed to determine the difference, if any, between the achievement scores in general psychology by different groups of students under experimental conditions using two different types of class structure and two types of course organization. These were given in Tables 15 and 16. The F value for differences in the two methods was 12.20 which is highly significant beyond the .01 level of significance. The F value for differences between two types of class structure, day and night, was 0.02.

When there is significant interaction, the main effects of the factors should be examined with caution. The high F value of 11.11 for the interaction showed lack of uniformity with the best combination favoring teaching and testing by chapters at night. Data were presented in Tables 15 and 16.

Table 15. Total scores in general psychology by class structure and course organization

| Course organization | Class structure | | | | Total for the course organization | |
| | Day | | Night | | | |
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Method I	268.21	N=28[a] 75.36	357.72	N=18 87.05	303.24	N=46 91.27
Method II	282.07	N=59 61.02	279.45	N=22 66.12	281.36	N=81 62.45
Total for class structure	277.61	N=87 66.29	314.67	N=40 85.62	289.28	N=127 74.94

[a]On this and the following tables, N is number of students in the group.

Table 16. Factorial analysis of variance using total scores
in general psychology by class structure and course
organization

Source	df	Sum of squares	Mean sum of squares	F value calcu- lated	Hypothesis
Class structure	1	109.43	109.43	0.02	Not rejected
Course organization	1	60,645.72	60,645.72	12.20**	Rejected
Interaction	1	55,223.00	55,223.00	11.11**	
Error	123	611,235.51	4,969.39		

Table value $F_{(.01)}$ = 6.85   Degrees of freedom = (1,123)

**Significant at .01 level.

Hypothesis 6: There was no difference in content retention by
students taught in two types of class structure, as measured
by the achievement on the semester test.

Hypothesis 7: There was no difference in the content retention
by students taught in the two methods of course organization,
as measured by the achievement on the semester test.

The data for the two hypotheses were calculated and pre-
sented in Tables 17 and 18.

Semester test scores in general psychology classes were
analyzed to determine differences in retention due to two types
of class structure and two methods of course organization.
Means, standard deviations, and the analysis of variance were

given in Tables 17 and 18. The F value for the two types of class structure was 0.07 and for two methods of course organization was 10.62. The latter was highly significant beyond the .01 level. The null hypothesis was rejected. The F value for the interaction was 2.62 but not high enough to suggest significant compatibility of any one type of class structure with any one method of course organization.

Hypothesis 8: There was no difference in the achievement in general psychology of the students grouped according to three different academic loads: 16 semester hours or more; 13 to 15 semester hours; and 12 or less semester hours during the semester they took general psychology.

The students were divided into three groups with different educational loads carried during the whole semester. The analysis of variance was calculated. The F value of 1.76 was insufficient to reject the null hypothesis at .05 level of significance. The interaction F value was also low, 0.49, insufficient to detect differences among the students in the three groups when taught by two methods of course organization. The data were presented in Tables 19 and 20.

Total scores in general psychology in Table 19 represented a sum of scores achieved by the students on all tests during the semester, including the final semester test.

Table 17. Semester test scores in general psychology by class structure and course organization

Course organization	Class structure				Course organization totals	
	Day		Night			
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Method I	67.70 N=28	20.49	78.22 N=18	23.68	71.91 N=46	22.41
Method II	57.88 N=59	14.01	59.09 N=22	14.40	58.21 N=81	14.12
Totals for class structure	60.97 N=87	16.94	67.70 N=40	21.37	62.61 N=127	19.55

Table 18. Factorial analysis of variance using semester test
           scores by class structure and course organization

Source	df	Sum of squares	Mean sum of squares	F value calcu- lated	Hypoth- esis
Between class structure	1	23.44	23.44	0.07	Not rejected
Between course organization	1	3,623.47	3,623.47	10.62**	Rejected
Interaction	1	894.89	894.89	2.62	
Error	123	41,964.81	341.17		

Table value $F_{(.05)}$ = 3.92   Degrees of freedom = (1,123)

$F_{(.01)}$ = 6.85

**Significant at .01 level.

Table 19. Total scores in general psychology with different education loads and course organization methods

Methods of course organization	Education load							
	12 or less semester hours		13-15 semester hours		16 or more semester hours		Total for methods	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Method I	N=8 303.38	84.04	N=19 291.89	94.23	N=19 314.53	89.77	N=46 303.24	91.27
Method II	N=3 327.33	16.21	N=27 261.81	55.53	N=51 289.00	64.51	N=81 281.36	62.45
Totals for education loads	N=11 309.91	72.95	N=46 274.24	75.48	N=70 295.93	73.13	N=127 289.28	74.94

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Table 20. Factorial analysis of variance using total general
           psychology scores by education loads and course
           organization methods

Source	df	Sum of squares	Mean sum of squares	F value calcu-lated	Hypoth-esis
Between course organization	1	9,019.91	9,019.91	1.62	
Between edu-cation load	2	19,631.88	9,815.94	1.76	Not rejected
Interaction	2	5,453.61	2,726.80	0.49	
Error	121	674,627.14	5,575.43		

Table value $F_{(.05)}$ = 3.07   Degrees of freedom = (2,121)

Hypothesis 9: There was no difference in achievement of stu-
dents taught through self-study of Chapter 14 and through a
combination of classroom discussions and self-study of 18
chapters.

Mean scores for 18 chapters included in Units 1 to 6,
inclusive, but excluding Chapter 14, were calculated by adding
all the scores for these chapters and dividing by 18. Scores
for Chapter 14 were calculated separately. For the purpose of
this hypothesis, t value was calculated using the formula for
correlated samples. The t value, 5.27, was highly significant.
This provided sufficient evidence to reject the null hypoth-
esis, beyond .01 level. Further comparison was made for the

two methods of course organization separately. The t values were 4.13 and 5.23 for the first and the second methods of course organization, respectively. These were also significant at .01 level of confidence. Data were given in Table 21.

Table 21. Mean scores on chapters studied in class and the self-studied Chapter 14

Course organization	Scores on 18 chapters		Scores on Chapter 14	
	Mean	Standard deviation	Mean	Standard deviation
Method I	12.37	3.77	11.39	4.41
Method II	11.85	2.78	10.30	3.71
Total for both methods	12.04	3.19	10.69	4.01

Table values

$$t_{(.01, 40)} = 2.704$$

$$t_{(.01, 80)} = 2.639$$

$$t_{(.01, 120)} = 2.617$$

Calculated values

$t_{(126)}$ both methods = 5.27** H_0 rejected

$t_{(80)}$ second method = 5.23**

$t_{(40)}$ first method = 4.13**

**Significant at .01 level.

<u>Hypothesis 10</u>: There was no difference in the learning of assigned units of the general psychology as measured by the average achievement of students when units were compared with one another in the second method of course organization--teaching and testing by units of the textbook in the course (general form).

Six units were involved in this comparison. Thus the hypothesis was subdivided into 15 sections (specific form) to determine the differences in learning among different units, as measured by the achievement on tests for these units. Calculated means, standard deviations, and "t" values were presented in Table 22.

(i) There was no difference between the achievement in Unit 1 and Unit 2 of the general psychology. The hypothesis was rejected at .01 level of significance.

(ii) There was no difference between the achievement in Unit 1 and Unit 3 of the general psychology. The hypothesis could not be rejected.

(iii) There was no difference between the achievement in Unit 1 and Unit 4 of the general psychology. The hypothesis was not rejected.

(iv) There was no difference between the achievement in Unit 1 and Unit 5 of the general psychology. The "t" value presented sufficient evidence to reject the hypothesis at .10 level of significance.

(v) There was no difference between the achievement in Unit 1 and Unit 6 of the general psychology. The "t" value justified rejection of null hypothesis at .05 level of significance.

(vi) There was no difference between the achievement in Unit 2 and Unit 3 of the general psychology. The "t" value was significant to reject the null hypothesis beyond .01 level.

(vii) There was no difference between the achievement in Unit 2 and Unit 4 of the general psychology. The hypothesis could be rejected at .01 level of significance.

(viii) There was no difference between the achievement in Unit 2 and Unit 5 of the general psychology. The "t" value was significantly high to reject the null hypothesis beyond .01 level.

(ix) There was no difference between the achievement in Unit 2 and Unit 6 of the general psychology. The "t" value was significantly high to justify rejection of null hypothesis beyond .01 level.

(x) There was no difference between the achievement in Unit 3 and Unit 4 of the general psychology. The hypothesis could not be rejected.

(xi) There was no difference between the achievement in Unit 3 and Unit 5 of the general psychology. The "t" value presented sufficient evidence to reject the null hypothesis beyond .01 level of significance.

(xii) There was no difference between the achievement in Unit 3 and Unit 6 of the general psychology. The "t" value was significant to reject the null hypothesis beyond .01 level.

(xiii) There was no difference between the achievement in Unit 4 and Unit 5 of the general psychology. The "t" value was high enough to reject the hypothesis at .05 level of significance.

(xiv) There was no difference between the achievement in Unit 4 and Unit 6 of the general psychology. The null hypothesis could be rejected at .01 level of significance.

(xv) There was no difference between the achievement in Unit 5 and Unit 6 of the general psychology. The null hypothesis could not be rejected.

The over-all pattern showed that there was significant decline in achievement, as measured by the tests, with the increased length of covered material for the test.

Hypothesis 11: There was no difference in the achievement in general psychology among the four groups of students when classified by college credits earned: 46 semester hours or more; 31 to 45 semester hours; 16 to 30 semester hours; and 15 or less semester hours prior to taking the general psychology course.

This comparison involved comparison of students grouped according to different educational standing in the college. The calculated means, standard deviations for the total scores

Table 22. Mean scores on chapters in different units and matrix of "t" values

Scores	Units					
	1	2	3	4	5	6
Mean	11.75	14.59	12.28	12.30	11.02	10.92
Standard deviation	3.39	6.17	3.55	4.97	3.56	3.08

Unit No. calculated "t" values

1		-4.378**	-1.650	-1.014	1.968	2.313*
2			3.342**	2.803**	5.106**	5.344**
3				-0.031	3.672**	3.886**
4					2.510*	2.718**
5						0.314

Tabular $t_{(.01, 80)} = 2.639$

$t_{(.05, 80)} = 1.990$

$t_{(.10, 80)} = 1.664$

* H_o rejected at .05 level of significance.

** H_o rejected at .01 level of significance.

in general psychology and the covariance analysis were given
in Tables 23 and 24. The F value for the comparison among the
groups was 0.89. The null hypothesis could not, therefore, be
rejected. The perusal of the data in Table 23 suggested better
academic achievement in direct proportion to the college
credits earned in the first method.

Hypothesis 12: There was no difference in the academic
achievement of the students in general psychology classified
by the chronological age, measured to the nearest whole year
at the beginning of the semester.

The students were divided into four categories by their
age, measured to the nearest whole year at the beginning of
the semester. Means and standard deviations were calculated
for their total scores on all the tests taken during and at
the end of the semester. Analysis of variance resulted in F
value of 0.49 for comparison among four groups. The null
hypothesis was not rejected. The F value of the interaction
showed that the first method of course organization was better
suited to the 21-years-or-older group of students according to
age at .05 level of significance. The value for the inter-
action was 3.12. Data were recorded in Tables 25 and 26.

Table 23. General psychology scores of students by educational standing and course organization

| | General psychology scores by educational standing (Semester hours of college work earned before taking general psychology) | | | | | | | |
| Course organization | 15 or less | | 16-30 | | 31-45 | | 46 or more | |
	Mean score	Standard deviation	Mean score	Standard deviation	Mean score	Standard deviation	Mean score	Standard deviation
Method I	282.30	94.89	300.18	84.26	321.00	68.00	351.20	74.12
Method II	274.06	61.72	311.17	63.01	275.75	64.62	283.60	30.61
Total for both methods	276.77	74.37	305.91	74.15	280.78	66.54	328.60	70.64
Number of students	46		31		38		12	

Table 24. Factorial analysis of variance using total general
psychology scores by educational standing and course
organization

Source	df	Sum of squares	Mean sum of squares	F value calcu- lated	Hypothesis
Between course organization	1	12,341.00	12,341.00	2.26	
Between educational standing	3	14,600.31	4,866.77	0.89	Not rejected
Interaction	3	12,875.99	4,292.00		
Error	119	650,708.41	5,468.14		

Table value $F_{(.05)}$ = 2.68   Degrees of freedom = (3,119)

Hypothesis 13: There was no difference in the achievement
between the two sexes as measured by the total performance on
the tests in general psychology.

Total scores for all the tests taken by the students
divided by sex were computed. The means, standard deviations,
and the analysis of variance by sexes were given in Tables 27
and 28. The F value of 10.076 was highly significant beyond
the .01 level and the null hypothesis was rejected.

Table 25. Total general psychology scores by different age groups and course organization

Course organization method	Age groups							
	18 years or below		19 years		20 years		21 years or more	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Method I	241.38	45.55	307.55	97.97	288.60	76.77	346.27	81.73
Method II	288.69	65.44	281.44	64.78	266.71	25.30	254.00	50.17
Total for different age groups	280.09	64.92	292.07	81.01	275.83	54.27	313.71	84.58

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Table 26. Factorial analysis of variance using total general
psychology scores by age groups and course organi-
zation

Source	df	Sum of squares	Mean sum of squares	F value calcu- lated	Hypoth- esis
Between course organization	1	33,055.35	33,055.35	6.16**	
Between age groups	3	7,929.67	2,643.22	0.49	Not rejected
Interaction	3	50,226.26	16,742.09	3.12*	
Error	119	638,727.65	5,367.46		

Table value $F_{(.01)}$ = 3.95

$F_{(.05)}$ = 2.68   Degrees of freedom = (3,119)

*Significant at .05 level.

**Significant at .01 level.

Hypothesis 14: There was no relationship between the high
school percentile ranks and the achievement in the general
psychology course.

Hypothesis 15: There was no relationship between the composite
scores on the A.C.T. tests taken by the students and the
achievement in the general psychology course.

Hypothesis 16: There was no relationship between the students'
achievement in general psychology and the evaluation of the
teacher by the students.

Data for the three hypotheses were recorded in correlation
matrix Table 29.

Table 27. Total scores of students in general psychology by
sexes

| | Total scores | | Number of students |
Sex	Mean	Standard deviation	
Male	270.81	68.54	57
Female	311.96	76.21	70
Whole class	289.28	74.94	127

Table 28. Analysis of variance using total general psychology
scores by sex groups

Source	df	Sum of squares	Mean sum of squares	F value calcu- lated	Hypoth- esis
Between sexes	1	53,197.00	53,197.00	10.076**	Rejected
Error	125	659,975.00	5,279.80		
Total	126	713,172.00			

Table value $F_{(.01)}$ = 6.85   Degrees of freedom = (1,125)

**Significant at .01 level.

Table 29. Correlation matrix for total general psychology scores and other independent variables

Variables	College classification	H.S. rank	A.C.T. scores	Outside work load	Grade given to instructor	College G.P.A.	Total scores general psych.
Sex	-0.10567	0.46931	-0.04355	-0.10269	-0.10838	0.21114	0.27313**
College classification		0.24262	0.12200	0.13444	0.12128	0.14736	0.19443*
H.S. rank			0.33750	0.11765	0.06265	0.27070	0.48520**
A.C.T. scores				0.05013	0.02384	0.19834	0.12455
Outside work load					-0.05655	0.25992	0.07068
Grade given to instructor						-0.35096	0.04090
College G.P.A.							0.37304**

Critical table value of $r_{(.05)}$ = .174   Mean grade given to instructor = 6.19

$r_{(.01)}$ = .228   Standard deviation   = 1.72

Degrees of freedom = 125

* Significant at .05 level.

** Significant at .01 level.

It was decided to compute the correlation between the high school percentile ranks and the achievement in general psychology. The correlation coefficient between the two variables was .485. This was sufficiently high to reject the null hypothesis beyond .01 level of significance.

The second variable used was the composite A.C.T. score for correlation with the total scores in general psychology. The correlation, 0.125, was insufficient to reject the null hypothesis.

The investigator was interested in finding the relationship between students' achievement and their evaluation of the instructor. Students graded the instructor on a nine-point scale yielding a mean of 6.19 and standard deviation of 1.72. The correlation coefficient between the two was 0.041, insufficient to reject the null hypothesis.

Model building was tried using six selected variables: high school percentile ranks (X_1); college classification (X_2); A.C.T. scores (X_3); college grade point average (X_4); sex (X_5); and outside work load (X_6), to predict the achievement scores in general psychology (Y). The regression analysis and prediction equation were presented in Table 30. The best equation evolved using all the six variables resulting in multiple R square 0.310. Two of the variables--sex and outside work load--could be eliminated without any significant loss. This gave a multiple R square value 0.307.

Table 30. Regression analysis using six variables and their values in the equation predicting total scores in general psychology (Y)

Source	df	Sums of squares	Mean sums of squares	Calculated F value
Due X_1, X_2, X_3, X_4, X_5, X_6	6	221,351.17	36,891.86	9.00
Due X_1, X_2, X_3, X_4	4	219,072.36	54,768.09	13.30
Due X_5 and X_6, adjusted for X_1, X_2, X_3, X_4	2	2,278.81	1,139.41	0.23
Error	120	491,820.63	4,098.50	

Table value $F_{(.01)}$ = 2.96   Degrees of freedom = 6,120

Multiple R square

using 6 variables = 0.310

using 4 variables = 0.307

Variables		Coefficient in the equation	"t" value	Standard error
X_1	High school rank	1.31	4.16	0.30
X_2	College classification	4.30	0.87	4.93
X_3	A.C.T. scores	-0.71	-0.90	0.78
X_4	College grade point average	9.85	3.29	0.30
X_5	Sex	2.73	0.19	14.27
X_6	Outside work load	-0.30	-0.67	0.45
	Intercept = 195.34		7.37	26.51

$$Y = 195.34 + 1.31\ X_1 + 4.30\ X_2 - 0.71\ X_3$$
$$+ 9.85\ X_4 + 2.73\ X_5 - 0.30\ X_6$$

Second regression analysis, presented in Table 31, using three variables--high school percentile ranks (X_1), college classification (X_2), and A.C.T. scores (X_3)--was tried. This was done to eliminate college grade point average, as the same could not be made available in real situation for the first semester college students. This resulted in multiple R square value 0.244. Prediction equations were developed using three, two and one variables, and recorded in Table 32. The best single indicator of achievement in general psychology was the high school percentile rank.

Third regression analysis and prediction equation were calculated using high school percentile ranks (X_1) and college grade point average (X_4). Results were given in Table 33. After the students have established their grade point average at the college, these two variables can be used to the best advantage of the students with economy. This gave a multiple R square value of 0.298.

Table 31. Regression analysis using H.S. percentile ranks
(X_1), college classification (X_2), and A.C.T.
scores (X_3) for predicting total scores in general
psychology

Source	df	Sum of squares	Mean sum of squares	F ratio	R^{2a}
Due X_1, X_2, X_3	3	173,805.20	57,935.07	13.21	0.244
Due X_1 alone	1	167,891.13	167,891.13	38.29	0.235
Due X_2, X_3 | X_1	2	5,914.07	2,957.04		
Due X_1, X_2	2	172,350.81	86,175.40	19.65	0.242
Due X_3 | X_1, X_2	1	1,454.39	1,454.39	0.33	
Due X_1, X_3	2	169,127.77	84,563.89	19.05	0.237
Due X_2 | X_1, X_3	1	4,677.43	4,677.43	1.06	
Due X_2 | X_1	1	4,459.68	4,459.68	1.00	
Due X_3 | X_1	1	1,236.64	1,236.64	0.28	
Error	123	539,366.60	4,385.09		

$F_{(3, 120, 0.99)} = 3.95$

$F_{(3, 120, 0.95)} = 2.68$

$F_{(2, 120, 0.95)} = 3.07$

$F_{(1, 120, 0.95)} = 3.92$

[a]R^2 was worked out individually.

Table 32. Coefficients, "t" values, standard errors, and
prediction equations using H.S. percentile ranks
(X_1), college classification (X_2), and A.C.T.
scores (X_3) predicting total scores in general
psychology (Y)

Variables	Coefficients	"t" value	Standard error
For $X_1 + X_2 + X_3$	$R^2 = 0.244$		
X_1	1.51	5.64	0.26
X_2	5.05	1.03	4.89
X_3	-0.45	-0.58	0.77
Intercept	207.02	10.68	19.39

Equation: $Y = 207.02 + 1.51 X_1 + 5.05 X_2 - 0.45 X_3$

For $X_1 + X_2$	$R^2 = 0.242$		
X_1	1.46	5.77	0.25
X_2	4.93	1.01	4.87
Intercept	200.51	12.76	15.71

Equation: $Y = 200.51 + 1.46 X_1 + 4.93 X_2$

For X_1	$R^2 = 0.235$		
X_1	1.52	6.20	0.25
Intercept	206.40	14.15	14.59

Equation: $Y = 206.41 + 1.52 X_1$

Table 33. Regression analysis using H.S. percentile ranks (X_1) and college grade point average (X_4) and prediction equation predicting total scores in general psychology (Y)

Source	df	Sum of squares	Mean sum of squares	F ratio	R^2
Due X_1, X_4	2	212,846.13	106,423.06	26.38	0.298
Due X_1	1	167,891.13	167,891.13	28.16	0.235
Due X_4, X_1	1	44,955.00	44,955.00	11.41	
Residual	124	500,325.59	4,034.88		

Variable	Coefficient	Standard error
X_1	1.39	0.24
X_4	9.35	0.28
Constant	189.26	

Equation: $Y = 189.26 + 1.39\,X_1 + 9.35\,X_4$

DISCUSSION

The objective of the study was to determine the effects of two experimental approaches to class structure and two methods of course organization in general psychology class. The students in this project had their choice to enroll in any type of class structure--day or night--and in any semester. This gave them freedom of selection of class structure that suited their needs. Course organization was predetermined by the investigator. Students had no knowledge of this prior to their registration.

Review of the research studies cited earlier indicated conflicting outcomes. Price (20) and Marcus (13) found that the students in on-campus and off-campus classes were comparable. Research conducted by Farnum (9) and Bridgman and Dysinger (3) both seemed to confirm findings of favorable comparability of performance of the on-and-off-campus students.

Studies by Pressey and Kinzer (19), Ball, Treffinger, and Ripple (2) and Pickett (18) gave the opposite results. According to these three studies, the off-campus students did not perform as well as did the on-campus students.

The present study appeared to confirm the findings that the groups of students in the day and night classes were quite comparable to each other. This is based on the comparisons for initial differences using high school ranks and the composite A.C.T. scores and their achievement in general

psychology. The F values given by the analysis of the data were not significant at .05 level. The interaction F value for interaction between class structure and course organization seemed to favor the students of the night class under the first method. The present investigator did not attribute this either to the better suitability of the three-hour class structure or to the learning ability of the students. He attributed this to the immediacy of the testing situation after studying in the class. It was reflected a little on the semester test scores, however. The F value, 2.62, of the interaction was, however, not significant.

The findings of the present investigation suggested that the teaching and testing by chapters was significantly better than the teaching and testing by units of the textbook, using the over-all performance for the semester. This investigator was of the feeling that teaching and testing by chapters required too much time in the administration of tests. Some via-media should be tried to serve the best interests of the students and also the better utilization of the instructor's time. The instructor's time is limited by class hours that he can devote to teaching during a semester for a course.

Further perusal of the results revealed by the mutual comparisons of first six units of the textbook under the second method suggested no loss in academic achievement of the students up to four chapters per unit as compared to one-chapter teaching and testing for the whole semester. He was, therefore,

of the opinion that the general psychology course should be reorganized into units consisting of material covered by three to four chapters of reading in one unit, resulting in about 75 to 80 pages of reading material for the test. This could help also in easy adjustment to the college situation after the high school. The experience of the investigator in the high school education showed that the students were more used to testing after shorter intervals and lesser quantity of reading material covered for the tests. This was further substantiated by the observation that:

1. There was immediate decline in the scores on tests when the number of chapters was increased compared with the previous tested unit.

2. On subsequent tests, the students appeared to recover their achievement scores with the increased number of chapters per unit.

The correlation found between the academic achievement by the student and the evaluation of the instructor by the students in this study was consistent with the findings of the Institutional Self-Study Survey (1, p. 55) conducted by the A.C.T. Program, Iowa City, Iowa in 1969. The correlations found by the latter for evaluation of different character-istics of the instructors by the students and their academic achievement in two-year colleges ranged from 0.00 to 0.12 with the majority of them being below 0.08. The correlation coefficient found in the present study between the performance

on tests by the students and their grading the instructor for his over-all teaching was 0.04.

The high school rank was the best single indicator for the academic achievement of the students. The correlation between the high school rank and the academic achievement in general psychology was 0.49. This finding further confirmed the results of several research studies reviewed by this investigator and reported by many others that the high school grade point average can be the most useful single criterion for prediction of success in academic courses in college.

Correlations of six variables--high school rank, college grade point average, sex, college classification, A.C.T. scores, and outside work load with the performance on tests in general psychology were calculated. Model building for pre-diction of achievement scores using two methods resulted in similar results.

Two of these variables--sex and outside work load--could be eliminated without any significant loss. The resultant prediction equation included high school percentile ranks (X_1), college classification (X_2), A.C.T. scores (X_3), and the college grade point average (X_4). This could be used for the students who had already established their college grade point average. To make it less involved, the investigator suggested the use of only two variables--high school percentile ranks (X_1) and the college grade point average (X_4). This gave a multiple R square value of 0.298.

The college grade point average used in this study was the grade point average earned to the close of the semester in which the general psychology course was taken. This was done to include the first semester students in the study.

Since the college grade point average could not be had for the first semester students--and there are many students taking general psychology in their first semester at the college--it was decided to use only three variables: high school percentile ranks (X_1); college classification (X_2); and A.C.T. scores (X_3). Results, as given in Table 31, gave multiple R square value of 0.242, using only X_1 and X_2. This indicated that the high school ranks and college classification, jointly, can give better prediction results.

It was of interest to note that the F value for comparisons of high school ranks was relatively higher than the F values for comparisons using A.C.T. scores for the same groups. The comparison of the two sexes resulted in great initial differences, using the high school ranks, between the two sexes. This was also in the comparisons for achievement in general psychology. The results favored the females over the male sex. This could be attributed to several reasons like outside interests, individual interests in subjects like psychology, value attached to the grades in academic achievement, socio-econo- and political demands. There was, however, no difference between the two sexes using the A.C.T. scores for comparison.

The perusal of the results for comparisons of four groups of students with varied outside work load appeared to favor the group with 31 or more hours of outside work load. This observation was in conflict with the observations of Conant (5) reviewed earlier. It appeared that these students valued education the most. Next in order of performance was the group with 11-20 hours of outside work load. This group consisted mostly of those students who were on work-study programs. Their needs to improve their socio-economic status through academic achievement could be the most important influencing factor.

Comparisons of students grouped according to their academic loads evidenced no statistically significant results. The group with 13-15 semester hours lagged behind in over-all performance on tests, when compared with the other two groups with 12 or less and 16 or more semester hours of academic load. This possibly could be explained on the empirical observation that it was usually the mediocre student who fell in this category for several reasons.

There is a popular belief that even though the instructor may simply repeat what is given in the textbook, it has an impact on the academic achievement of the students suggesting their class attendance and provision of the teacher. This belief could be said to have gained strength using the findings of this study. The students fared significantly better on all the tests for the material covered in class discussions as

compared with the material that was left to the students for their self-study alone.

The analysis of the results for the comparison among students grouped according to their educational standing was not statistically significant. The perusal of the means and standard deviations for the first method only indicated that the groups as a whole performed better in direct relationship to their educational standing--like the group with 46 or more semester hours earned credit achieved the highest scores. This was also supported by the correlation coefficient of 0.194 between the college classification and the total test scores in general psychology. There could be only one possible explanation for this--the students with the longest time lapse between the high school's general practice of teaching and testing by lesser quantity of textbook material cherished the revival of similar situation the most. Similar results in the comparisons based on chronological age of the students were evidenced in the interaction F value of 3.12.

In general, the investigator recommends that the community colleges and the institutions of higher learning provide easy transition from high school to college by reorganizing the course content for all types of courses during the freshman year. Slowly the change could be made toward covering more material for any test during the sophomore, junior and senior years. Introduction of evening classes at the undergraduate

level needs further study for its effectiveness and comparability to the day classes.

SUMMARY

The present study was an evaluation of the experimental methods on achievement in general psychology at the Iowa Central Community College. The study was conducted for three semesters. Experimental methods tried were:

1. Two types of class structure: one, teaching three one-hour classes three days a week; and two, teaching one three-hour class one night a week.

2. Two methods of course organization: first, teaching and testing by chapters; and second, teaching and testing by the units consisting of a different number of chapters.

The sample of the students' population used in this study was a group of all the students, 127, that enrolled in the general psychology course at the Iowa Central Community College, Webster City, Iowa during fall and spring semesters of 1968-69 and fall of 1969-70.

This study was divided into four sections:

1. Study of differences in academic achievement due to two types of class structure and two methods of course organization.

2. Study of differences in academic achievement due to sex, outside work load, academic load, self-study and a combination of self-study and class discussion, differing number of chapters in the units studied under the second method, college classification, and chronological age of the students.

3. Determination of correlation between different independent variables and the academic achievement and the evaluation of the teacher by the students related to their academic achievement.

4. Development of a prediction equation for academic achievement in general psychology using six independent variables.

Investigation of initial differences between the groups of students under different comparisons for testing the hypotheses was done using the high school percentile ranks and the A.C.T. composite scores. Tests at five percent level of significance revealed no significant initial differences between the groups of students under two types of class structure and two methods of course organization, using either one of the characteristics. The only significant difference, beyond one percent level, was between males and females, using the high school percentile ranks. No difference was evidenced using the A.C.T. scores.

Comparison of the achievement scores in general psychology for two types of class structure did not evidence any significant differences between the two. Statistically a highly significant difference beyond one percent level did appear in the comparison of the two methods of course organization. Evidence of better suitability for teaching and testing by chapters for the night class resulted from a covariance analysis. Identical results were obtained in comparing the

results of a semester test for two types of class structure and two methods of course organization except that the interaction F value was not very high.

The second section of the study required comparisons of students grouped according to other independent variables. Computation of F values for comparisons using outside work load, academic load, college classification, and chronological age did not result in significant differences in the academic achievement. The sex difference in achievement was highly significant. Difference was also evidenced in the learning when comparisons were made among six units with number of chapters varying from two to five in a unit. Calculation of the "t" statistic resulted in statistically significant differences. This might be interpreted that students learned more in inverse proportion to the number of chapters studied in a unit. Students achieved higher average scores in units comprising two chapters compared with units of three, four, or five chapters in descending order.

The examination of differences between self-study by the students, and a combination of self-study and class discussion, gave statistically significant results. This favored the combination of classroom discussion and self-study, significant beyond one percent level.

Under the third section, correlations were calculated using different independent variables. The coefficient of correlation between the grade given to the instructor by the

students was a low of 0.04, insignificant at five percent level. A.C.T. scores also had a correlation of 0.12, not sufficient to reject the null hypothesis.

The null hypothesis of no correlation between high school ranks and the achievement in general psychology was rejected beyond one percent level of significance.

The last section was to develop a prediction equation for achievement scores in general psychology (Y). Six variables were included in descending order of importance, dependent upon their correlations with the dependent variable (Y). These were high school percentile ranks (X_1), college grade point average (X_4), sex (X_5), college classification (X_2), A.C.T. scores (X_3), and outside work load (X_6). The model building resulted in an equation:

$$Y = 195.34 + 1.31\ X_1 + 4.30\ X_2 - 0.71\ X_3$$
$$+ 9.85\ X_4 + 2.73\ X_5 - 0.30\ X_6$$

Further considerations led to two separate equations: one, for those who had established their grade point average at the college; and the second, for those who were first semester students.

For established students:

$$Y = 189.26 + 1.39\ X_1 + 9.35\ X_4$$

For first semester students:

$$Y = 200.51 + 1.46\ X_1 + 4.93\ X_2$$

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This investigator is inspired by the couplets written by a poet, Kabir, in 1398 in Hindi.

गुरू गोविन्द दोनो खड़े, काके लागूँ पाँय ।
बलिहारी गुरू आपने, गोविन्द दियो दिखाय ॥
कबीरा ते नर अन्ध हैं, गुरू को कहत और ।
हरि रूठे गुरू ठौर हैं, गुरू रूठे नहीं ठौर ॥

These couplets mean:

Teacher and God, Both are standing, to whom pay respects?
          To thee, Teacher, who showed me God.
Blind they, who see Teacher as different than God,
          If God refuseth, thou saveth;
          If thou refuseth, none saveth.

According to this author's confirmed beliefs, the education of a person starts from the time of conception. The first teacher is the mother and next is the father. This line of teachers continues to grow every moment of one's life. Special emphasis is, however, placed on the teachers engaged in the formal education of the man. This list is also fairly long.

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Last, but not the least important, were the students who helped the author learn more through a process of mutual learning and understanding.

APPENDIX

The following information is only for research purposes.
Please give the information as accurately as possible. If you
do not have any information, please let me know if it is avail-
able in the college records so that I may have it from there.
This implies your kind permission to get the relevant informa-
tion.

Prem Sahai

Course: General Psychology

Name of the Student:

Age, nearest whole years:　　　　　　ACT scores:

High School Grade Point Average on 4.00 scale:

Number of Semester hours that you will have completed at the
end of the Fall 1968-1969 semester:
　　　　　Spring 1969:
　　　　　Fall 1969-70:

Average number of hours per week for the whole of Fall 1968-
1969 semester that you may have been working to earn your way
through college, household chores, and upkeep of your family
if married:

For the following questions, your reactions will be kept
confidential and used only for the above referred research.
Please circle any one response on the line. Score of 9 is the
highest score and that of 1 is lowest.

1. How has been the use of audio-visual aids in your class?

   Great help ..9 ..8 ..7 ..6 ..5 ..4 ..3 ..2 ..1 ..No help

2. How would you grade your instructor for his over-all per-
   formance in teaching, knowledge of subject matter, desire
   to help you, and any other criteria you like to consider?

   Excellent ..9 ..8 ..7 ..6 ..5 ..4 ..3 ..2 ..1 ..Poor

GENERAL PSYCHOLOGY: Sem. 1/2 1968-69
                                                             Sem. 1 1969 (69-70)

Name: Married/ Unmarried

High School Grade Point Average on 12 pt. scale ....

College Classification: Freshman / Sophomore

If Sophomore, Your College Grade Pt. Average up to the end
    of last semester ....·

Have you previously taken any course in
    Psychology?   Yes / No

If yes, what course and when ....

Number of credit hours that you are registered this
    semester ....

Number of semester hours that you have completed at the post-
    high school level up to the end of last semester ....

Number of hours that you are working per week to pay for your
    college education? ....

If you had full freedom to schedule your classes, what time
    schedule you would like to select for your General Psych.
    Class? Circle time.

                Three days a week, day time.

                One day a week, in the evening.