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An Investigation of Library Skills Acquired by Fifth Grade Students at Harvard Elementary School, Franklin Pierce District, Tacoma, Washington

Larry D. Rodahl
Central Washington University

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AN INVESTIGATION OF LIBRARY SKILLS ACQUIRED BY FIFTH GRADE

STUDENTS AT HARVARD ELEMENTARY SCHOOL, FRANKLIN

PIERCE DISTRICT, TACOMA, WASHINGTON

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A Thesis

Presented to

the Graduate Faculty

Central Washington State College

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In Partial Fulfillment

of the Requirements for the Degree

Master of Education

———————————

by

Larry D. Rodahl

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APPROVED FOR THE GRADUATE FACULTY

_____

Helen D. Patton, COMMITTEE CHAIRMAN

_____

M. S. Brunner

_____

Arthur Yonke

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

The elementary school library is the center where a
full range of print and audio-visual media are accessible
to students and teachers (2:xv). The elementary school
library is sometimes known by other names such as the in-
structional materials center, media center, or learning
resource center. These names indicate that the library is
not just a storehouse for books, but the center from which
learning and learning materials may be obtained. The ele-
mentary school library, as described above, has only re-
cently become part of the elementary school. Prior to 1960
most elementary schools did not have a centralized library
service. The common trend was for each room to have a small
collection of books. These collections were often traded
between rooms or continuously shared by the students of
different rooms (18:464).

The emphasis for centralized libraries within a
school building has been the result of many factors. The
collection in a room was always limited in size and content.
The books became worn and outdated. They were not usually
classified in a way in which location of needed informa-

tion could be readily found.

The multimedia approach to education, based on the recognition that children learn in different ways, probably caused the greatest need for a centralized library (19:18). The multimedia approach is to present the concept to be learned in an array of ways by exposing the student to many materials of various types. The American Library Association stresses that:

> The media program is indispensable in the educational programs that now stress individualization, inquiry, and independent learning for students. Media convey information, affect the message, control what is learned, and establish the learning environment (2:1,3).

Media, then is seen as a tool to enhance learning. New learning programs and individualized programs have stressed the use of media and have included media in their programs. Publishers have expanded their output to include many related materials in the form of books, tapes, discs, cassettes, films, filmstrips, film loops, slides, transparencies, kits, collections, and pictures. Government monies have encouraged the acquisition of book collections and various other types of media. The logical place for the storage and circulation of this media is in the school library (13:475).

In this way the elementary school library emerges. Space has been made available for the library facilities by remaking a former classroom, by moving a portable building to the school site, or by building an addition

to the school. In new school buildings, the library is often centrally located, easily accessible to students and teachers, and is constructed to accommocate individuals, small groups, and class size groups. The center is capable of handling a continuous flow of users.

When a new library is created, its successful continuation becomes dependent upon many things:

1. The collection must be kept up to date. The acquisition of new and relevant materials is a continuous process. It is necessary to remove unused and outdated materials from the collection. It is also necessary to duplicate worn materials and those heavily used.

2. The collection must be useable. Not just the books, but all materials should be classified in an organized, easy to use, method (1:4). Up to date catalogues and guides should be available for the collection. Materials should be properly and speedily reshelved.

3. The library must be properly staffed. The duties assumed by the librarian include those of selecting materials, acting as a resource person, and guiding individual students in learning activities. These duties closely parallel those of a teacher and demand that the librarian be a professionally trained person (23:17).

4. Students must possess the necessary skills for the proper utilization of the library. Skills include

those processes, ideas, methods, and tools used in the library to locate and assimilate information.

5. The library must be available to students at any time they may personally have need to use it (17:8).

I. THE PROBLEM

Statement of the Problem

This study investigates two factors that were assumed to influence the amount and kind of library skills acquired by fifth grade students during the period of two consecutive years at Harvard Elementary School. The two factors were teacher-librarian cooperation and library availability.

Purpose of the Study

Students, with the expansion of knowledge, should be able to seek independently that part of knowledge which seems important to them. Library skills can be keys to this knowledge. The study of literature points to the fact that cooperation between the teacher and the librarian is highly desirable in teaching library skills (9:3). Literature further points that it is an individual's right to have available information (1:7).

A child learns things which are meaningful to him. Library skills will be more meaningful if these skills are related to what the child is learning in the classroom.

Teacher-librarian cooperation and extended availability of
the library were attempts to aid meaningful learning. This
study was designed to relate that through teacher-librarian
cooperation, there would be a gain in the mastery of library
skills. This study was further designed to note that
through the extended availability of the library there
would be a gain in the mastery of library skills.

Limitations of the Study

An attempt has been made to note those extraneous
variables which might have been a possible limitation to
this study. The writer of this paper was personally in-
volved in the study as a teacher of two of the groups of
children. The writer of this paper and the teacher of the
other two groups did not correlate their library skills
emphasis with each other. The extended use of the library
was only possible when this use did not inconvenience other
classes. The test used, Peabody Library Information Test,
Elementary Level, was copyrighted in 1940. A discussion
of this test is given in Chapter III.

II. DEFINITIONS OF TERMS USED

Library

The term library has specifically been used to mean
elementary school library. The term library has been used
rather than media center, instructional materials center,

or learning resource center. The definition for the term library was found in the <u>Dictionary</u> <u>of</u> <u>Education</u>:

> An organized collection of books and other teaching aids housed in a school for the use of pupils and teachers and in charge of a librarian or a teacher (7:319).

Library Skills

The <u>Dictionary</u> <u>of</u> <u>Education</u> defines skills as: "Anything that the individual has learned to do with ease and precision (7:503). Library skills in this study referred to those processes, ideas, methods, and tools used in the library to locate and assimilate information.

Cooperation

Cooperation was defined as the joint effort of the librarian and teacher in teaching library skills and in presenting follow-up activities to strengthen and utilize these skills.

Library Availability

Library availability has been used to refer to student accessibility to the library.

Experimental Groups

The term experimental groups referred to those groups of children who received extended use of the library and those groups whose teachers cooperated with the librarian in library skills training.

Control Groups

The term control groups referred to those groups of children who were limited to one weekly half hour library period and those groups whose teachers made no proclaimed or intentional attempt to cooperate with the librarian in library skills training.

CHAPTER II
REVIEW OF THE LITERATURE

The review of the literature was done with reference
to the following four areas: 1. The consequences when
library skills are not taught. 2. Evidence to support
the value in teaching library skills. 3. Teacher-librarian
cooperation related to positive skills assimilation. 4.
The effect that availibility of the library has on skill
learning.

I. THE CONSEQUENCES WHEN LIBRARY SKILLS
ARE NOT TAUGHT

Society is placing strong demands upon the schools
in the area of accountability. Case has said "Education
is going to be on the firing line to be held accountable
for what it achieves." He goes further to say that lib-
rarians must be able to "relate their ability to meet the
job performance requirements directly to the successful
development of the final product--the student" (4:852).

Morse declares, "The library cannot be operated as
though it were a passive repository for printed material"
(14:1). The library should be a living, vibrant, function-

ing organism of the school program which meets the needs

of the individual students. This should not take away

from the fact that the facilities of a library ought to be

discovered and explored by every child. Rhodes reports

about the elementary school student in this way:

> He feels more free to explore, to take the
> books down from the shelves, to handle them, to
> sample. In these years he has time that he may
> never have again, once the burden of extensive
> homework falls on his shoulders, to wonder with-
> out definite goals to follow his own desires and
> interests among books (17:7).

According to statistical data obtained by Morse,

there are college students who never develop skills but

continue to locate materials in an exploratory manner.

Morse concluded, "Browsing, as a method of finding the

book or periodical desired, is at least as popular as the

use of the card catalogue" (14:185). In an article by

Tripp, those who do not possess certain skills have not

reached a degree of maturity:

> Students are abysmally ignorant of the most
> basic reference tools, and often the teachers
> who sent them there seem not much better in-
> formed. The student who has learned to gather
> information quickly and efficiently has mastered
> the mechanics of maturity as a student, much as
> in learning the conventions of social behavior
> he masters the mechanics of maturity as a social
> being (21:4514).

II. EVIDENCE TO SUPPORT THE VALUE IN
TEACHING LIBRARY SKILLS

A skills program in schools was well under way in

Washington State by 1964. Eight hundred thirty-six elementary schools responded to a survey conducted by the Washington State Office of Public Instruction. The survey indicated that eight-seven percent of the schools responding to the survey gave library orientation to new students at the beginning of the school year. Seventy-seven percent had planned programs of instruction beyond the orientation period. Fifty percent had their own curriculum guide or manual for library instruction (22:63).

Rhodes expressed that ability to use library skills is "attitude-conditioning", and should be trained in the child in the early impressionable years. This author further says that the child gains independence through using the school library. This independence will later help him cope with the high school curriculum (17:7).

Gaver makes the reference to the value of relating library skills to the curriculum:

> Children who have had systematic instruction in library skills closely related to the curriculum and the opportunity to use an organized library collection consistently and continuously score higher on work-study tests and/or on tests of library skills than do children lacking this opportunity (5:121).

Henne concurs with this idea of integrating the program of library instruction with the curriculum. The skills needed will be determined by the content of the curriculum and the kinds of library resources used (8:18).

Skills for the curriculum are important, but there is something more important than the curriculum--the needs of the individual student. Differing abilities exist in addition to the differing needs of students. Henne makes the following statement about abilities:

> In the program of library instruction, the recognition of individual abilities is stressed . . . When the program of library instruction is truly integrated with classroom instruction, the needs of the retarded, the slow, the under-achieving, and the academically talented are taken care of in a realistic and natural way (8:17).

To summarize the articles in this section, Bowden closely agrees with others in writing the all inclusive statement:

> Children not only require mastery of the tools of learning--reading, writing, and arith-metic--but effective methods of locating and using the tremendous amounts of information available to them (3:1).

III. TEACHER-LIBRARIAN COOPERATION RELATED TO POSITIVE SKILLS ASSIMILATION

Library guides produced by school systems tend to point to the fact that student involvement in the library, including the learning of skills, is under the joint re-sponsibility of the teacher and the librarian. The library guide for Highline Public Schools states:

> A cooperative plan is needed between the li-brarian and the teacher for teaching the skills that will enable students to use the library effectively (9:3).

The idea of cooperation is picked up by the Long Beach
Public Schools by the statement that "teacher-librarian
cooperation is essential to maximum student growth and
development" (12:7). The Pasco School District speaks of
a team in their library guide:

> When teachers and librarians form a team and
> work together, they help promote study skills
> that lead to independence in learning (16:ii).

The Oakland Public Schools guide links teacher-librarian
cooperation with a successful school program (15:1).

This apparent need for cooperation is also voiced
by other writers. Jones includes the administration in
the cooperation and refers to such cooperation as an essen-
tial ingredient for an effective library program (11:16).
Hodges reports that recent research indicates the teacher
and librarian working together have a greater influence
on pupils' reading than either the teacher or librarian
working alone (10:1). In the conclusions of a study done
by Sturdivant, she noted "The presence of the classroom
teacher in the library during the skills instruction seemed
to have an added learning effect on students" (20:30).

In a study done by Gengler a different approach was
taken to the same cooperative problem. An experimental
group had librarian operated library instruction classes
which helped assist classroom teachers in providing problem
solving skill training. The control group did not have a

librarian available. The results of a selected skills test indicated the experimental group obtained a significantly higher mean (6:34).

IV. THE EFFECT THE AVAILABILITY OF THE
LIBRARY HAS ON SKILL LEARNING

A problem closely related to the acquisition and maintenance of library skills is the availability of the library facilities. The American Library Association includes in its standards the statement that:

It is the right of every child and young person in a democratic society to have the resources of learning easily accessible, primarily because these resources and the school library program that implements their use constitute a fundamental part of the education of youth (1:7).

The idea of availability does not only refer to the presence of materials in the school building, but how readily available these materials are to the child when he has a need for them. Rhodes makes the statement that:

The immediate availability of books when the library is a part of the elementary school becomes important when the sense of timing of children is considered . . . Books can be obtained immediately from the school library. The hunger to fill the need can vanish between right now and soon (17:8).

Gaver positively links the opportunity to use an organized library collection consistently and continuously with scores achieved on tests (5:121). To schedule classes of students in the library without regard to need seems

illogical. Individual needs can be better met when the child is free to use the library at any time.

CHAPTER III
DESIGN OF THE STUDY

This study was done at Harvard Elementary School, Franklin Pierce School District #402, Tacoma, Washington. The study began in the school year 1969-1970, and was concluded in the school year 1970-1971. Four fifth grade classes were used in the study.

The question, "How can the library best be used to student advantage?" was the incentive for this study. The study was designed to compare two aspects: teacher-librarian cooperation in skills training and availability of the library facilities.

Teacher-librarian cooperation in skills training was used primarily to mean that the teacher, being aware of skills taught by the librarian, presented follow-up activities to strengthen and utilize these skills.

The library in question was not readily available to student use. The library occupied a former thirty by thirty foot classroom, accessible by a single door. The presence of bookshelves, tables, work areas, and carrels, caused the room to be crowded when used by an entire class. The library was serviced by a qualified librarian for a

period of two and one-half hours each afternoon. Each
class had a weekly scheduled one half-hour period for its
use. The library room was used for special education
classes during part of each morning.

Extended use of the library was obtained by allowing
students to leave the classroom, at any time, to go to the
library. The library was available for use before and
after school, during recess and lunch, when the room was
empty, and when the class in the library was not involved
in listening to skills presentation, to instruction, or to
a story.

The standardized test used to measure gain in li-
brary skills was the Peabody Library Information Test,
Elementary Level written by Louis Shores and Joseph E.
Moore. A copy of this test may be found in Appendix B.
This test, copyrighted in 1940, was the only available
standardized test for library skills.

The Peabody Library Information Test is a compre-
hensive library test having ninety-seven questions covering
seventeen areas involving library skills and library related
knowledge. The use of a comprehensive test was advisable
because the teachers of the different groups may have em-
phasized differing aspects involving library skills. The
Peabody test includes questions involving the Dewey Decimal
Classification System, as commonly used in school libraries.

Testing in the field of specialized media would be diffi-
cult as there are many types of media and various methods
of classification.

The library skills presented by the librarian and
the skills which received follow-up by the teachers were
not related to those on the test in any systematic way.
A pre-test and post-test using the same form was given to
all groups. The pre-test was given in November of each
school year. This was after the librarian had presented
all orientation and all formal skills instruction. The
post-test was given in late May each year.

I. DESCRIPTION OF CLASS GROUPS AND EACH GROUP'S PART IN THE STUDY

Group A

Group A was one of the two fifth grade classes en-
rolled in Harvard Elementary School during the school year
1969-1970. Group A had twenty-seven students who were
enrolled from September through June. Students who came
and/or left during the year were not a part of this study.
The mean intelligence quotient for Group A was 104.15, as
measured by the Lorge-Thorndike Intelligence Test. The
students of Group A received library orientation and skills
instruction from the librarian. The oreintation and skills
instruction was similar to that given to the other three

groups and was in accordance with the district's library curriculum guide. There was no proclaimed or intentional cooperation between the teacher and the librarian in the teaching of library skills or in follow-up activities involving library skills. Group A served as a control group to check the aspect of teacher-librarian cooperation in skills training.

Group A had access to the school library for one scheduled weekly period. During this half hour period students became orientated to the library facilities, received skills instruction, selected materials for classroom assignments, selected materials for personal interests and recreational reading, and were responsible for the circulation procedures of the materials they selected. Little opportunity was afforded for additional use of the library facilities. Group A also served as a control group to check the aspect of the availability of the library facilities.

Group B

Group B was the second fifth grade class enrolled in Harvard Elementary School during the school year 1969-1970. Group B had twenty-four students enrolled from September through June. The mean intelligence quotient was 104.04, as measured by the Lorge-Thorndike Intelligence Test. The students of Group B received library orientation and skills instruction similar to that of Group A. There

was no proclaimed or intentional cooperation between the teacher and the librarian in teaching of or in follow-up of library skills. Group B served as a control group to check the aspect of teacher-librarian cooperation in skills training.

Group B had access to the school library for one scheduled weekly period. The students in Group B, however, were allowed to use the library at various times when it did not inconvenience other classes. This extended use involved class activities when the entire class worked in the library on some specific assignment and personal activities when an individual would go to the library to seek information or select materials. Opportunity was provided for each student in Group B to make a visit to the Main Branch of the Tacoma Public Library to select books. Group B also served as an experimental group to check the aspect of the availability of the library facilities.

Group C

Group C was one of the two fifth grade classes enrolled in Harvard Elementary School during the school year 1970-1971. Group C had twenty-eight students. The mean intelligence quotient was 108.86, as measured by the Lorge-Thorndike Intelligence Test. The students of Group C received library orientation and skills instruction similar to that received by Groups A and B the year before. The

teacher planned and presented follow-up activities related
to some of the skills training given by the librarian.
Most of these activities were related to subject matter
taught by that teacher. These activities were not elabor-
ated upon here because the writer of this paper and the
other teacher did not correlate any of their activities
involving library skills. Group C served as an experimental
group to check the aspect of teacher-librarian cooperation
in skills training.

Group C had access to the school library for one
scheduled weekly period. Little opportunity was afforded
for additional use of the library facilities. Group C also
served as a control group to check the aspect of availabil-
ity of the library facilities.

Group D

Group D was the second fifth grade class enrolled
in Harvard Elementary School during the school year 1970-
1971. Group D had thirty-two students. The mean intel-
ligence quotient was 109.84, as measured by the Lorge-
Thorndike Intelligence Test. The students of Group D re-
ceived library orientation and skills instruction similar
to that received by the other groups. The teacher planned
and presented follow-up activities related to some of the
skills training given by the librarian. A sampling of
these activities or lessons may be found in Appendix A.

Group D served as an experimental group to check the aspect of teacher-librarian cooperation in skills training.

Group D had access to the school library for one scheduled weekly period. The students in Group D were allowed extended use of the library similar to that of Group B. Students in Group D made a visit to the Main Branch of the Tacoma Public Library. Group D served as an experimental group to check the aspect of availability of the library facilities.

Table I is a summary of how each class group related to the rest in terms of class size, intelligence quotient, year involved, and whether a control or an experimental group for teacher-librarian cooperation and library availability.

TABLE I

SUMMARY OF IMPORTANT DIFFERENCES AMONG GROUPS A, B, C, AND D

Group	Year	Group I.Q.	Size	Cooperation Aspect	Extended Use Aspect
A	1969-70	104.15	27	Control	Control
B	1969-70	104.04	24	Control	Experiment
C	1970-71	108.86	28	Experiment	Control
D	1970-71	109.84	32	Experiment	Experiment

II. SUBJECT MATTER ACTIVITIES UTILIZING LIBRARY SKILLS

The lessons or activities included in Appendix A

were all related to subject matter taught to Group D. Objectives involving library skills were as follows:

The primary objective was that students would develop skills in finding, reading, and organizing information from various sources independently.

The secondary objectives were: (1) students would become aware of a need for classification in a library, (2) students would establish an understanding of the classification system used, (3) students would demonstrate an ability to locate materials, (4) students would demonstrate an ability to use the card catalog, (5) students would become familiar with many types of reference materials, (6) students would become familiar with the collection in general.

A sampling of the lessons or activities given to Group D appears in Appendix A.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The results of the study, as determined by the pre-
test and post-test of the <u>Peabody</u> <u>Library</u> <u>Information</u> <u>Test</u>,
<u>Elementary</u> <u>Level</u>, are discussed in this chapter. Table II
shows the mean pre-test scores and the mean post-test
scores along with the numerical gain of the post-test over
the pre-test.

TABLE II

MEAN SCORE GAIN OF POST-TEST OVER PRE-TEST
FOR GROUPS A, B, C, AND D

Groups	Pre-test Score Mean	Post-test Score Mean	Numerical Gain
A	38.93	42.70	3.77
B	38.83	45.58	6.75
C	45.79	49.61	3.82
D	42.13	50.97	8.84

For each group, the mean post-test score is higher than
the mean pre-test score. Groups B and D show gains that
are considerably higher than those of Groups A and C.

Group D shows the greatest gain.

The results as indicated by Table II can be further clarified by a comparison with Table I. Group A, a control group for both teacher-librarian cooperation and the extended availability of the library, had a mean gain of 3.77 correct responses or the smallest gain of the four groups. Group B, a control group for cooperation but an experimental group for extended availability, had a higher mean gain of 6.75 correct responses. Group C, an experimental group for cooperation but a control group for extended availability, had a mean gain of 3.82. Group C's gain was comparable to that of Group A. Group D, an experimental group for both cooperation and extended availability, had the greatest mean gain, that of 8.84 correct responses. Figure 1 graphically shows the gains of the four groups.

Table III shows a breakdown of the question groups with the post-test scores as a percent of the pre-test scores. The high rise in percentages for the last three items may be attributed to the fact that an increasing number of students finished the post-test who did not finish the pre-test within the thirty minute time limit.

Question group number five deals with numeration ability. Each of the four groups had some skills training in numeration from the librarian prior to the pre-test. Each group had some proficiency in numeration at the time of the pre-test. The pre-test percentage scores for ques-
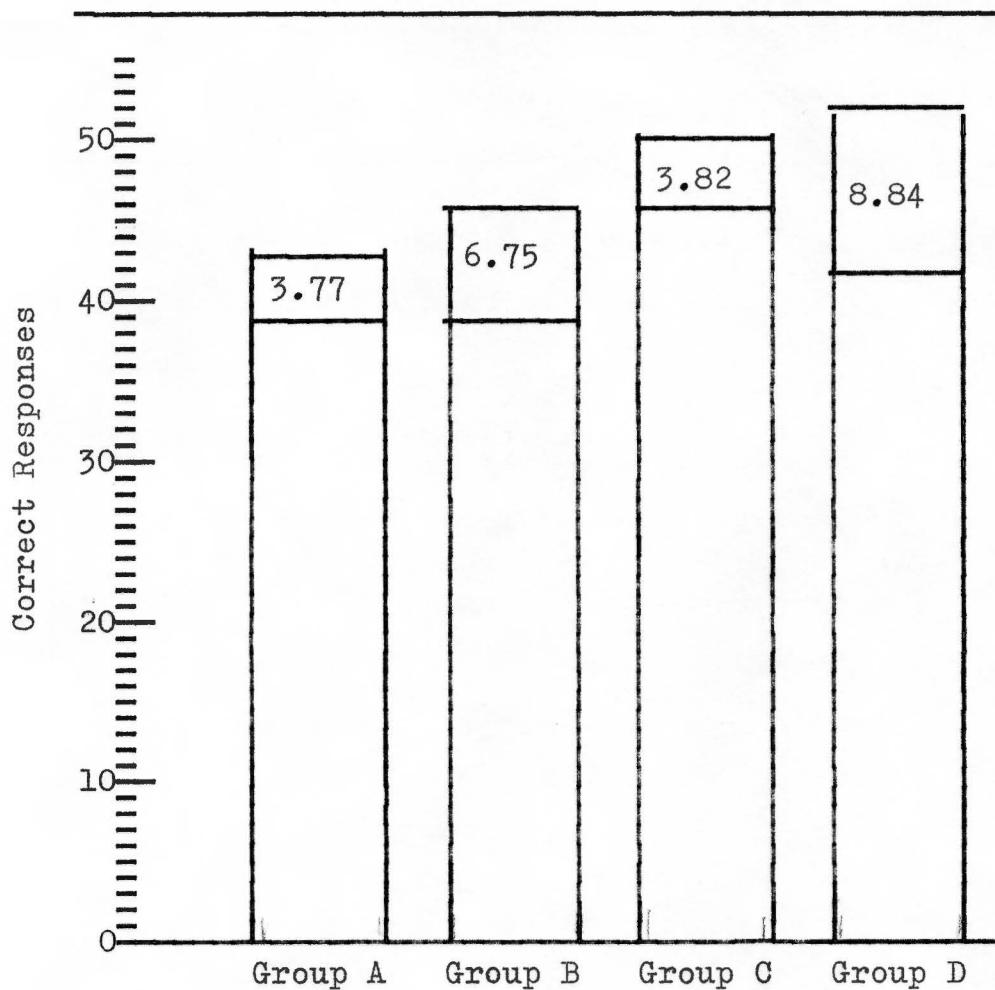
FIGURE 1

THE MEAN GAIN IN CORRECT RESPONSES OF THE POST-TEST
OVER THE PRE-TEST FOR GROUPS A, B, C, AND D

TABLE III

THE POST-TEST SCORES AS A PERCENT OF THE
PRE-TEST SCORES BY QUESTION GROUPS

Question Group	Group A	Group B	Group C	Group D
1	11.03	15.87	2.50	12.09
2	8.47	28.26	-2.82	16.42
3	0	14.55	6.15	17.53
4	0	4.48	0	5.83
5	-66.67	6.38	-18.18	37.04
6	7.14	6.17	- .88	5.88
7	- 5.26	10.48	- 2.65	-15.58
8	17.54	17.54	56.61	50.00
9	8.16	-21.43	1.59	4.11
10	7.06	- 3.80	18.18	15.52
11	160.00	40.00	0	5.00
12	22.97	19.72	4.00	27.55
13	-30.56	46.67	18.75	19.30
14	33.33	17.02	12.66	58.62
15	50.00	66.67	163.65	208.34
16	90.63	186.36	36.07	272.00
17	180.00	220.00	62.50	899.71

tion group five were Group A--37.04, Group B--39.17, Group C--27.86, and Group D--33.75. Group D shows a sizable increase and Group B shows a small increase. Both Groups A and C suffered excessive losses. The students in Group D participated in activities involving the arrangement of numerals.

Table IV shows question group items which showed a gain of twenty percentage points or more on the post-test over the pre-test.

TABLE IV

POST-TEST QUESTION GROUP SCORES WHICH GAINED TWENTY
PERCENTAGE POINTS OVER PRE-TEST SCORES

Group	Question Group	Pre-test	Post-test	Gain
A	16	23.70	45.19	21.49
B	16	18.33	52.50	34.17
C	8	37.86	59.29	21.43
D	8	41.25	61.88	20.63
D	14	45.31	71.88	26.57
D	16	15.63	58.13	42.50

All items shown on this table represent a gain of one or more correct responses per student on the question group indicated.

Question group number sixteen deals with interpreting

information found in a bibliographic entry. Groups A, B, and D have considerable gains on this question group. Group D, which shows the largest gain of 42.50 percentage points, participated in activities involving bibliographic entries. Activities for Group D appear in Appendix A.

Question group number fourteen deals with interpreting information found in a Readers' Guide to Periodical Literature reference. The reference was similar to a bibliographic entry. Group D participated in activities involving bibliographic entries.

Question group number eight deals with locating information with the aid of cross references. Groups C and D had considerable gains. None of the Group D activities closely related with this question group. Both Groups C and D worked extensively with encyclopedias which may explain the gain in this cross reference area.

Two additional question groups noted are groups twelve and fifteen as referred to in Table III. Question group number twelve, dealing with locating subjects and titles in the card catalog can be associated with one of the Group D activities. Group D had a gain which was higher than the gains of the other groups but this gain was not significant. Question group number fifteen deals with general library related knowledge. Group D had a considerable gain in percentage points of 19.53.

Table II indicated that Group D had a greater mean gain than did Groups A, B, or C. Tables III and IV indicated that Group D had greater gains on various question groups than did Groups A, B, or C.

CHAPTER V

SUMMARY, OBSERVATIONS, AND RECOMMENDATIONS

Chapter V contains a summary of the study, a discussion of the observations made by the writer of this paper in relation to the results of the pre-test and the post-test and recommendations involving possible implementations and future studies.

I. SUMMARY

The intent of this study was to determine whether the two factors, teacher-librarian cooperation and library availability, would influence the amount and kind of library skills that would be acquired by fifth grade students. The study was conducted over a two year period beginning with the school year 1969-1970, and ending with the 1970-1971 school year. Four fifth grade classes enrolled in Harvard Elementary School, Franklin Pierce School District, Tacoma, Washington, were evaluated as to library skills acquired by a pre-test and a post-test of the Peabody Library Information Test, Elementary Level.

II. OBSERVATIONS

Each of the four groups in the study made some progress from the time they took the pre-test until the time they took the post-test. The knowledge they had at the time of the pre-test was assumed to have been influenced by the skills training program given by the school librarian. The students evidently acquired the additional skills by using the library. This use, in some instances, had the support of training and guidance by the librarian and/or the teacher. It is not probable that much of the test was remembered over the six month lapse of time between the pre-test and the post-test. Neither of the tests was announced in advance nor were the results discussed by the teachers.

It was evidenced by comparing the results of the post-test with those of the pre-test that the aspects of teacher-librarian cooperation and extended library availability did effect the amount and kind of library skills that were acquired by the various groups of students. The results of tests showed students of Group D gained most in the acquisition of library skills when they were allowed extended use of the library and when there was teacher-librarian cooperation in the presentation and follow-up of library skills training.

When students of Group B received extended use of

the library without teacher-librarian cooperation, there
was still considerable gain in the acquisition of library
skills. When students in Groups A and C were limited to
a weekly one-half hour period in the library the addition
of the teacher-librarian cooperation aspect had no measur-
able effect on the acquisition of library skills.

The study by Sturdivant recommended that: "further
investigation would be desirable to determine the extent
of the influence of the classroom teacher on her students
in the library" (20:30). The writer of this paper would
have to conclude that teacher cooperation with the librarian
in library skills training has no measurable influence when
the use of these skills in a library is limited. Rivlin
has stated:

> The full educational use of the school li-
> brary is not achieved through a short series of
> special lessons on the use of the card catalogue
> and reference books (18:464).

The results of this study have indicated through
teacher-librarian cooperation there were gains in the
mastery of library skills only when cooperation was linked
to the aspect of extended library availability. This
study has further indicated that through the extended
availability of the library there were gains in the mastery
of library skills.

III. RECOMMENDATIONS

Recommendations were made involving possible actions or implementations by librarians and teachers and possible future studies.

Library curriculum guides and the programs of instruction in library skills should be closely correlated with course of study curriculum guides by grade level and modified to meet the differing situations of the various schools and teachers.

Teachers should re-evaluate the purposes for which they send students to the library. An open library with no scheduled class times may prove to be of more value to teachers in terms of work load than the weekly half hour free period received when the students all leave the room to use the library.

A study should be made into the extended availability aspect in a situation where there would be no limitations put on the student use of the library.

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APPENDIX A

ACTIVITIES

APPENDIX A

ACTIVITIES

Arranging Books

The necessary materials included the classroom
collection of approximately two hundred books. The class
was divided into small groups of four to six students.
The books were randomly distributed to the groups.

The assignment was to put the books into some order.
From the order obtained, students were instructed to number
or letter the books so the order could be maintained. A
group spokesman was asked to explain the classification
and arrangement of the books to the class and accept con-
structive criticism.

Collection Familiarization

The necessary materials included a shelf of books
in the library.

The assignment was to tell what the books were
about on a particular shelf and how they were classified.

Arranging Numerals

The necessary materials included a list of numerals
which were the Dewey Decimal Classification Numerals for
books.

The assignment was to arrange the numerals in nu-
merical order, the order in which books would be placed

on a shelf. Figure 2 was given as an example for students who did not fully understand decimals.

Book Numbers	Money
629.01	$629.01
629.1	$629.10
629.13	$629.13
629.2	$629.20

FIGURE 2

A COMPARISON OF BOOK NUMBERS AND MONEY

Locating Cards

The necessary materials included the card catalog and a list of books arranged under author, title, and subject.

The assignment was to locate the book card and record the call number.

Comparing Cards

The necessary materials included the card catalog, nine by twelve inch card stock, and three by five inch cards.

The assignment was to find an author card, a title card, and a subject card for one book. Students were instructed to make a copy of each card and to display them on a nine by twelve inch piece of card stock.

Vocabulary

The necessary materials included a notebook.

The assignment was to make a dictionary of new words. The words were to be student suggested and teacher assigned. They were to be library related words, subject area related words, and personal interest words.

Reference Description

The necessary materials included a reference book, a bulletin board, and student prepared display.

The assignment was to make a bulletin board display on what could be found in a dictionary, encyclopedia, or other reference book.

Reference Use

The necessary materials included the library.

The assignment was to have a question a day, or other regular period, that would require the use of reference materials.

Bibliographic Entry

The necessary materials included a number of reference books and record forms.

The assignment was to find as many sources as possible that state the same fact, such as, Olympia is the capital of Washington. Students were instructed to record the sources on forms as shown in Figure 3.

Information Looked Up
_____

Call #	Author
	Title
	Volume Page Date Published

Information Looked Up
_____

Call #	Author
	Title
	Volume Page Date Published

FIGURE 3

REFERENCE AND BIBLIOGRAPHIC ENTRY FORM

Personal Reading Records

The necessary materials included record forms.

The assignment was to (1) keep a record of each book used to find information, Figure 3, and (2) keep a record of books read, Figure 4.

READING RECORD OF _____

Date	Title	Author	Comment

FIGURE 4

PERSONAL READING FORM

APPENDIX B

<u>PEABODY LIBRARY INFORMATION TEST</u>

<u>ELEMENTARY LEVEL</u>

Please note: Text in appendix B has been redacted due to copyright concerns.

PEABODY LIBRARY INFORMATION TEST

Developed by

LOUIS SHORES
JOSEPH E. MOORE
George Peabody College, Nashville

Elementary Level

APPENDIX C

RAW DATA

TABLE V

PRE-TEST SCORES, POST-TEST SCORES, AND GAINS FOR GROUP A

Student	I.Q	Pre-test Score	Post-test Score	Gain
1F	125	66	71	5
2M	123	64	56	- 8
3F	123	60	66	6
4F	122	56	53	- 3
5M	110	55	43	-12
6F	112	51	53	2
7M	98	48	41	- 7
8M	114	46	46	0
9M	107	45	55	10
10F	108	44	56	12
11M	103	43	53	10
12M	105	42	21	-21
13F	119	41	56	15
14F	108	40	40	0
15F	106	38	50	12
16F	110	37	47	10
17F	107	36	33	- 3
18F	92	34	38	4
19M	88	32	20	-12
20F	100	28	26	- 2
21M	90	26	30	4
22F	101	25	40	15
23F	88	24	45	21
24M	84	21	24	3
25F	87	17	35	18
26M	82	16	26	10
27M	100	16	29	13
Total	2812	1051	1153	102
Mean	104.15	38.93	42.70	3.77

TABLE VI

PRE-TEST SCORES, POST-TEST SCORES,
AND GAINS FOR GROUP B

Student	I.Q.	Pre-test Score	Post-test Score	Gain
1F	126	62	67	5
2F	119	58	66	8
3F	114	56	54	- 2
4F	127	52	61	9
5M	94	50	56	6
6F	109	48	57	9
7F	112	47	51	4
8F	93	47	43	- 4
9F	122	46	53	7
10M	108	44	41	- 3
11F	123	44	64	20
12F	88	44	40	- 4
13F	110	42	55	13
14F	100	40	46	6
15F	107	40	48	8
16M	106	32	32	0
17F	106	32	47	15
18F	94	31	48	17
19M	88	28	24	- 4
20M	80	23	28	5
21M	98	20	30	10
22M	100	19	23	4
23M	86	17	42	25
24F	87	10	18	8
Total	2497	932	1094	162
Mean	104.04	38.83	45.58	6.75

TABLE VII

PRE-TEST SCORES, POST-TEST SCORES,
AND GAINS FOR GROUP C

Student	I.Q.	Pre-test Score	Post-test Score	Gain
1M	116	68	66	− 2
2M	108	63	55	− 8
3M	114	62	51	−11
4M	116	62	65	3
5F	112	59	68	9
6F	115	55	63	8
7F	120	55	61	6
8F	103	53	49	− 4
9F	113	51	53	2
10F	110	50	51	1
11F	114	49	61	12
12F	122	48	63	15
13M	117	48	52	4
14F	116	46	46	0
15M	96	45	35	−10
16F	114	42	41	− 1
17M	118	41	65	24
18M	106	39	47	8
19M	110	39	44	5
20F	109	39	54	15
21M	101	38	39	1
22F	97	37	30	− 7
23F	99	37	31	− 6
24M	101	36	29	− 7
25F	88	35	39	4
26M	110	34	53	19
27M	106	31	39	8
28M	97	20	39	19
Total	3048	1282	1389	107
Mean	108.86	45.79	49.61	3.82

TABLE VIII

PRE-TEST SCORES, POST-TEST SCORES,
AND GAINS FOR GROUP D

Student	I.Q.	Pre-test Score	Post-test Score	Gain
1F	124	65	72	7
2M	112	62	51	-11
3M	116	58	70	12
4M	122	58	60	2
5F	129	57	64	7
6M	106	56	58	2
7F	107	55	62	7
8F	114	53	63	10
9F	118	53	62	9
10M	124	53	54	1
11M	115	50	47	- 3
12F	110	49	58	9
13F	113	46	38	- 8
14M	102	46	54	8
15M	108	46	61	15
16F	100	44	50	6
17M	110	43	63	20
18F	116	40	59	19
19F	116	39	53	14
20F	104	39	57	18
21F	112	37	39	2
22F	113	36	54	18
23M	106	36	34	- 2
24F	94	34	52	18
25M	115	33	57	24
26M	104	31	33	2
27M	90	31	37	6
28F	120	27	38	11
29F	97	26	42	16
30F	100	22	34	12
31M	88	21	43	22
32M	90	2	12	10
Total	3515	1348	1631	283
Mean	109.84	42.13	50.97	8.84

TABLE IX

NUMBER OF CORRECT STUDENT RESPONSES BY QUESTION GROUPS
AS ACHIEVED BY GROUP A ON THE PRE-TEST

Student	Question Groups																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1F	6	3	5	5	5	3	6	5	4	5	1	4	1	6	1	5	1
2M	6	4	3	5	5	3	6	5	4	5	0	4	2	5	3	4	0
3F	7	4	1	5	2	4	6	4	3	5	0	5	1	5	1	4	3
4F	4	3	1	5	5	4	5	0	5	4	1	5	7	6	1	0	0
5M	4	4	2	3	1	4	6	5	3	6	0	6	7	2	2	0	0
6F	6	4	5	4	0	5	6	5	3	3	0	6	1	3	0	0	0
7M	6	2	1	4	0	3	6	5	0	4	0	2	7	3	1	4	0
8M	6	2	3	3	0	5	5	1	3	5	0	3	2	4	0	4	0
9M	5	1	3	4	2	4	6	5	3	5	0	2	1	3	1	0	0
10F	6	1	5	2	3	5	6	0	0	4	1	4	1	4	2	0	0
11M	6	2	0	2	0	2	6	2	3	3	1	4	1	5	0	5	1
12M	6	2	2	3	0	3	6	4	0	0	0	4	7	4	1	0	0
13F	6	2	5	3	2	5	5	0	0	3	0	3	1	3	3	0	0
14F	6	2	1	3	5	2	5	5	1	2	0	3	1	3	1	0	0
15F	7	3	2	4	2	3	5	0	2	5	0	4	1	0	0	0	0
16F	7	3	2	3	1	4	6	0	2	4	0	4	1	0	0	0	0
17F	6	3	5	3	0	2	6	0	3	3	1	2	2	0	0	0	0
18F	4	1	3	2	0	2	6	2	4	2	0	4	1	2	1	0	0
19M	6	2	1	5	5	3	0	1	4	3	0	2	0	0	0	0	0
20F	5	1	0	3	2	3	6	2	0	3	0	2	1	0	0	0	0
21M	5	0	2	3	5	4	6	0	0	1	0	0	0	0	0	0	0
22F	5	1	1	2	0	2	5	4	0	5	0	0	0	0	0	0	0
23F	2	2	0	2	3	3	4	0	0	2	0	0	1	1	0	4	0
24M	6	2	1	2	0	3	6	0	1	0	0	0	0	0	0	0	0
25F	3	3	2	2	0	2	5	0	0	0	0	0	0	0	0	0	0
26M	6	1	0	2	0	1	0	0	0	2	0	1	0	1	0	2	0
27M	3	1	1	1	2	0	4	2	1	1	0	0	0	0	0	0	0
Total	145	59	57	85	50	84	140	57	49	85	5	74	47	60	18	32	5

TABLE X

NUMBER OF CORRECT STUDENT RESPONSES BY QUESTION GROUPS AS ACHIEVED BY GROUP A ON THE POST-TEST

Student	Question Groups																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1F	7	3	5	5	3	5	6	5	5	6	2	3	4	6	1	4	1
2M	5	4	3	5	0	5	6	5	2	4	0	4	1	4	3	4	1
3F	7	4	3	5	1	5	3	1	2	5	2	6	7	6	3	4	2
4F	4	2	1	5	0	4	6	0	3	5	0	5	7	4	3	4	0
5M	6	3	1	2	0	5	6	5	2	0	0	3	0	1	4	5	0
6F	7	3	1	3	1	5	6	5	3	4	0	4	1	2	4	2	2
7M	6	2	3	4	1	3	6	0	0	2	1	2	1	6	1	2	1
8M	7	2	3	3	2	4	5	2	2	5	0	3	1	3	1	3	0
9M	6	2	3	5	2	2	5	5	1	4	1	4	1	5	2	5	2
10F	7	4	3	3	2	3	6	0	5	4	1	6	1	6	0	4	1
11M	6	2	1	2	2	4	6	5	3	4	1	4	2	3	2	4	2
12M	6	1	1	3	2	3	5	0	0	0	0	0	0	0	0	0	0
13F	7	4	5	5	2	5	5	0	2	3	1	4	1	5	2	4	1
14F	6	2	3	3	0	2	5	1	3	4	0	4	2	4	1	0	0
15F	6	3	5	5	2	4	5	0	5	4	0	4	1	4	0	2	0
16F	7	3	3	3	2	3	6	5	1	4	0	4	1	3	0	2	0
17F	6	3	1	3	0	2	6	1	3	3	1	3	1	0	0	0	0
18F	7	1	3	1	0	2	6	1	0	4	1	2	2	5	0	3	0
19M	6	2	1	2	1	0	5	0	0	2	0	1	0	0	0	0	0
20F	6	2	0	2	0	4	2	4	0	3	0	3	0	0	0	0	0
21M	5	2	3	4	0	5	5	2	0	2	1	0	1	0	0	0	0
22F	7	3	0	4	0	4	6	5	1	5	1	4	0	0	0	0	0
23F	4	2	3	2	2	3	6	5	2	4	0	6	0	4	0	2	0
24M	4	0	0	0	0	4	3	5	0	0	0	4	1	1	0	1	1
25F	6	2	0	2	3	1	4	5	2	4	0	5	0	1	0	0	0
26M	4	1	2	2	0	1	0	0	4	3	0	3	0	3	0	3	0
27M	6	2	0	2	2	2	3	0	2	3	0	0	0	4	0	3	0
Total	161	64	57	85	30	90	133	67	53	91	13	91	36	80	27	61	14

TABLE XI

NUMBER OF CORRECT STUDENT RESPONSES BY QUESTION GROUPS AS ACHIEVED BY GROUP B ON THE PRE-TEST

Student	Question Groups																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1F	6	3	5	4	5	4	6	5	0	4	0	4	7	3	1	5	0
2F	5	3	3	4	2	5	5	5	3	5	1	6	1	5	3	2	0
3F	6	3	3	5	5	5	6	0	5	3	0	4	1	4	1	4	1
4F	5	2	3	2	0	2	5	5	2	6	1	5	1	5	2	5	1
5M	4	2	1	2	0	4	6	5	4	6	1	3	7	3	1	1	0
6F	6	3	5	3	2	4	6	5	2	5	0	6	1	0	0	0	0
7F	7	2	5	2	0	3	5	5	5	6	2	4	1	0	0	0	0
8F	6	4	3	2	5	4	5	5	5	3	0	2	1	2	0	0	0
9F	6	2	3	5	0	4	6	5	6	3	0	4	1	1	0	0	0
10M	7	3	0	2	1	5	6	5	2	4	0	4	1	4	0	0	0
11F	5	2	0	2	5	5	5	0	0	4	0	3	1	4	1	4	3
12F	3	2	5	2	2	4	5	5	3	6	1	5	1	0	0	0	0
13F	5	3	2	3	3	4	6	0	2	5	0	2	1	5	1	0	0
14F	6	2	1	4	5	3	4	1	2	4	0	3	1	3	1	0	0
15F	7	1	3	2	0	5	5	5	5	4	0	2	1	0	0	0	0
16M	7	3	2	4	2	4	5	0	0	5	0	0	0	0	0	0	0
17F	0	1	5	4	1	2	6	0	1	4	1	1	1	4	1	0	0
18F	6	1	1	2	3	2	6	0	3	1	0	3	1	2	0	0	0
19M	5	1	2	2	0	2	6	0	0	2	2	3	1	2	0	0	0
20M	4	1	1	5	2	1	5	0	0	1	1	2	0	0	0	0	0
21M	4	0	0	3	2	2	6	1	1	0	0	2	0	0	0	0	0
22M	5	0	2	1	0	3	6	0	0	0	0	2	0	0	0	0	0
23M	5	0	0	0	2	4	3	0	0	1	0	1	0	0	0	0	0
24F	6	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	126	46	55	67	47	81	124	57	51	82	10	71	30	47	12	22	5

TABLE XII

NUMBER OF CORRECT STUDENT RESPONSES BY QUESTION GROUPS
AS ACHIEVED BY GROUP B ON THE POST-TEST

Student	Question Groups																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1F	7	4	5	4	2	5	6	5	0	4	1	4	2	6	4	5	3
2F	7	3	5	4	5	3	6	5	4	5	1	6	1	5	2	4	1
3F	7	3	3	2	2	5	6	6	0	5	0	4	1	4	1	4	2
4F	6	5	3	3	2	4	6	5	3	5	0	4	1	4	3	5	2
5M	5	2	3	3	0	4	6	5	4	3	2	3	4	4	3	5	1
6F	6	3	5	3	2	5	5	5	0	6	1	4	1	3	2	5	1
7F	7	3	5	3	5	3	6	4	1	4	1	4	1	4	0	0	0
8F	6	4	1	4	1	3	5	5	1	3	0	5	2	3	0	0	0
9F	7	3	1	5	5	5	6	5	6	4	0	4	0	2	0	0	0
10M	7	3	1	2	0	5	6	5	2	5	0	4	1	0	0	0	0
11F	7	4	5	3	5	5	6	2	5	4	0	5	1	4	3	4	1
12F	5	0	1	5	1	4	6	0	0	5	0	7	2	0	0	3	0
13F	6	2	1	2	2	5	6	5	3	4	1	6	1	3	2	5	1
14F	6	2	5	2	2	2	6	0	3	4	2	2	1	3	0	5	1
15F	6	2	5	4	0	4	5	4	4	3	1	6	1	3	0	0	0
16M	7	4	1	3	0	4	5	5	0	3	0	0	0	0	0	0	0
17F	5	2	3	4	2	3	6	0	0	3	3	4	1	5	0	5	1
18F	7	2	1	2	1	5	6	0	2	3	0	3	7	2	0	5	2
19M	6	0	1	0	2	0	6	0	0	0	0	0	5	0	0	4	0
20M	2	1	1	3	3	2	5	0	0	1	1	2	7	0	0	0	0
21M	5	1	0	2	2	3	5	1	2	3	0	3	3	0	0	0	0
22M	7	2	3	3	1	2	5	0	0	0	0	0	0	0	0	0	0
23M	7	2	1	4	5	3	6	0	2	2	0	5	1	0	0	4	0
24F	5	2	3	0	0	2	6	0	0	0	0	0	0	0	0	0	0
Total	146	59	63	70	50	86	137	67	42	79	14	85	44	55	20	63	16

TABLE XIII

NUMBER OF CORRECT STUDENT RESPONSES BY QUESTION GROUPS
AS ACHIEVED BY GROUP C ON THE PRE-TEST

Student							Question Groups										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1M	6	4	5	5	5	5	5	5	5	6	2	4	1	4	1	5	0
2M	7	3	5	4	5	3	6	0	4	5	0	6	1	4	2	4	4
3M	6	3	5	2	2	4	6	5	5	5	2	7	1	4	1	3	0
4M	6	3	5	4	5	5	6	5	1	5	1	5	1	4	0	4	2
5F	6	3	2	4	1	5	6	5	3	3	0	3	7	6	0	2	3
6F	6	2	3	3	1	4	6	0	3	4	1	4	7	5	1	2	1
7F	5	4	4	5	0	4	6	5	3	5	0	3	2	4	1	4	0
8F	6	3	1	2	2	5	6	0	3	4	1	5	7	3	1	3	1
9F	6	3	3	3	2	3	5	5	1	5	0	5	1	3	1	5	0
10F	6	3	1	5	0	3	5	2	4	5	0	5	7	4	0	0	0
11F	4	3	3	3	0	5	5	5	3	4	1	4	1	4	0	4	0
12F	7	2	5	3	0	5	5	5	4	4	0	1	1	2	0	3	1
13M	5	5	5	4	1	5	6	0	2	6	0	4	1	4	0	0	0
14F	7	3	0	4	1	5	5	5	1	5	0	1	1	2	2	4	0
15M	6	3	3	3	0	3	6	5	3	4	0	3	2	2	0	2	0
16F	7	3	1	4	1	5	6	1	2	3	0	3	1	2	0	3	0
17M	5	3	1	4	0	3	5	0	3	3	1	4	0	2	1	3	3
18M	5	3	0	4	0	5	4	0	0	4	1	3	7	1	0	2	0
19M	5	3	2	3	5	5	6	0	3	5	0	2	1	0	0	0	0
20F	6	2	1	4	1	4	5	0	1	4	0	4	0	5	0	0	0
21M	5	0	3	3	0	5	6	0	1	2	0	4	7	0	0	2	0
22F	6	2	0	4	1	3	6	0	0	5	0	5	1	4	0	0	0
23F	5	3	3	0	2	4	6	0	2	1	0	4	4	0	0	3	0
24M	5	1	1	2	3	5	5	0	0	4	1	3	0	3	0	1	1
25F	6	2	2	4	0	3	5	0	1	3	1	3	0	3	0	2	0
26M	6	1	0	4	1	5	6	0	3	3	0	2	1	2	0	0	0
27M	4	0	1	4	0	1	6	0	2	3	2	3	1	2	0	0	0
28M	6	3	0	4	0	3	5	0	0	0	0	0	0	0	0	0	0
Total	160	73	65	98	39	115	155	53	63	110	14	100	64	79	11	61	16

TABLE XIV

NUMBER OF CORRECT STUDENT RESPONSES BY QUESTION GROUPS
AS ACHIEVED BY GROUP C ON THE POST-TEST

Student	\	\	\	\	\	Question Groups	\	\	\	\	\	\	\	\	\	\	\
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1M	6	4	5	5	2	5	6	5	5	6	1	3	1	5	3	4	1
2M	6	4	3	2	1	3	6	5	5	6	1	4	1	2	1	4	1
3M	6	3	1	4	0	4	6	5	1	5	1	4	1	4	2	3	1
4M	5	2	3	5	5	5	6	5	2	5	2	5	7	3	2	4	3
5F	7	4	1	4	1	5	5	5	1	5	0	6	7	6	3	5	3
6F	7	4	5	5	2	5	4	5	3	5	0	4	1	4	2	4	3
7F	7	5	3	4	0	5	6	5	4	5	0	5	1	4	2	4	1
8F	6	1	0	4	1	4	3	3	2	5	1	4	7	3	0	4	1
9F	6	4	3	3	2	2	6	5	2	2	0	5	1	5	1	4	2
10F	6	2	3	5	1	5	6	3	1	6	0	4	1	4	0	3	1
11F	7	3	5	4	0	4	5	5	2	5	1	3	1	7	3	4	2
12F	7	4	5	4	5	4	6	5	5	5	1	3	1	3	1	3	1
13M	6	4	1	4	0	4	6	0	2	6	0	5	5	4	1	4	0
14F	7	3	3	2	0	2	6	5	2	6	0	2	1	3	2	4	2
15M	6	1	0	2	1	5	6	0	0	3	0	2	3	1	0	4	1
16F	5	2	2	4	2	4	5	5	2	3	1	0	1	4	1	0	0
17M	5	4	2	5	1	5	6	0	4	5	0	7	7	5	1	4	1
18M	6	2	3	3	1	4	6	3	1	5	0	3	1	3	1	4	1
19M	6	1	1	3	1	3	6	3	5	4	0	3	7	2	1	0	0
20F	6	3	3	3	2	4	5	5	3	5	1	4	1	3	2	4	0
21M	5	0	1	3	0	5	6	0	1	3	0	3	7	1	0	4	0
22F	6	1	1	4	1	2	6	0	1	4	0	4	0	0	0	0	0
23F	4	3	5	0	0	5	6	0	0	3	1	0	1	1	0	2	0
24M	4	0	0	3	1	4	0	0	0	4	1	4	0	4	0	3	1
25F	6	2	2	3	1	4	5	0	4	4	0	5	3	0	0	0	0
26M	6	2	2	4	0	4	5	5	3	5	2	4	7	4	0	0	0
27M	5	0	1	3	0	4	6	0	1	6	0	5	1	3	0	4	0
28M	5	3	5	3	2	4	6	1	2	4	0	3	1	1	0	0	0
Total	164	71	69	98	33	114	151	83	64	130	14	104	76	89	29	83	26

TABLE XV

NUMBER OF CORRECT STUDENT RESPONSES BY QUESTION GROUPS
AS ACHIEVED BY GROUP D ON THE PRE-TEST

Student	Question Groups																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1F	7	3	5	5	2	5	6	5	5	5	2	6	1	4	1	3	0
2M	7	3	5	4	5	5	4	5	2	5	1	4	1	4	3	4	0
3M	6	3	5	5	2	3	5	5	3	5	2	4	7	3	0	0	0
4M	6	3	5	4	5	5	5	5	4	5	2	3	1	4	1	0	0
5F	7	2	5	4	2	5	6	3	5	5	1	5	0	4	1	2	0
6M	7	2	5	2	1	5	6	5	5	4	1	6	1	2	0	4	0
7F	7	5	5	4	2	4	4	5	5	5	1	4	1	4	0	0	0
8F	7	3	3	3	5	4	6	5	1	4	1	5	1	2	2	0	0
9F	7	4	3	4	2	4	6	5	4	3	1	5	1	3	0	0	0
10M	5	2	3	2	1	5	6	5	2	5	0	4	7	4	2	0	0
11M	6	2	3	3	0	4	6	5	3	5	0	2	7	3	0	1	0
12F	5	4	1	4	0	5	5	0	3	5	0	4	7	4	0	0	0
13F	6	0	3	4	1	4	6	0	0	0	0	5	7	3	0	5	2
14M	5	2	5	3	2	5	6	0	1	5	2	6	1	3	0	0	0
15M	6	3	3	3	5	5	6	0	5	6	1	3	0	0	0	0	0
16F	2	1	1	3	0	5	6	0	4	2	1	5	7	4	1	2	0
17M	6	3	1	2	1	4	6	0	2	6	2	2	7	1	0	0	0
18F	6	3	1	2	1	3	6	1	4	4	0	5	1	3	0	0	0
19F	6	3	5	4	0	3	6	0	3	4	0	4	1	0	0	0	0
20F	6	2	3	4	0	4	6	5	1	2	0	3	1	0	0	0	0
21F	6	0	1	2	2	2	6	0	1	5	0	3	1	3	1	4	0
22F	6	2	3	4	2	5	6	2	5	1	0	0	0	0	0	0	0
23M	7	3	5	4	1	4	6	0	0	6	0	0	0	0	0	0	0
24F	6	2	2	5	2	3	6	0	3	4	1	0	0	0	0	0	0
25M	4	2	5	4	3	4	6	0	0	4	0	1	0	0	0	0	0
26M	4	0	1	3	1	0	6	0	0	2	0	6	7	0	0	0	0
27M	5	0	1	3	3	3	5	5	2	1	0	3	0	0	0	0	0
28F	6	1	1	3	1	4	6	0	0	5	0	0	0	0	0	0	0
29F	5	2	5	2	0	4	6	0	0	1	1	0	0	0	0	0	0
30F	6	2	3	2	2	1	6	0	0	0	0	0	0	0	0	0	0
31M	5	0	0	2	0	2	6	0	3	2	0	0	0	0	0	0	0
32M	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	182	67	97	103	54	119	178	66	76	116	20	98	68	58	12	25	2

TABLE XVI

NUMBER OF CORRECT STUDENT RESPONSES BY QUESTION GROUPS
AS ACHIEVED BY GROUP D ON THE POST-TEST

Student	Question Groups																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1F	7	2	5	5	5	5	6	5	5	6	0	7	1	6	3	4	0
2M	7	3	1	4	5	3	6	5	1	6	0	0	0	0	3	5	2
3M	6	4	5	5	2	4	5	5	5	6	2	4	1	5	3	5	3
4M	6	4	5	4	5	5	6	5	1	3	0	2	2	4	3	4	1
5F	6	2	5	5	2	4	6	5	3	6	1	7	1	3	1	4	3
6M	7	2	5	5	2	5	6	5	5	5	1	4	1	4	0	0	0
7F	7	4	5	4	5	4	5	5	2	6	1	5	1	3	1	4	0
8F	7	3	5	5	5	3	6	5	1	4	1	6	1	2	2	5	2
9F	7	4	3	4	2	3	6	5	4	4	2	5	1	4	2	4	2
10M	6	3	1	3	1	4	6	5	1	0	0	4	7	5	3	5	0
11M	7	1	5	3	2	4	6	1	3	3	0	3	1	3	1	5	0
12F	7	2	5	3	2	4	5	5	1	4	1	6	1	5	2	4	1
13F	6	1	5	0	0	0	0	5	3	4	0	3	1	3	0	5	2
14M	5	2	5	3	0	5	6	0	2	5	1	5	1	3	2	4	0
15M	6	2	3	5	1	4	5	5	1	4	2	7	7	4	0	4	0
16F	6	3	1	2	0	4	6	0	0	5	0	5	7	4	1	4	2
17M	7	3	5	4	5	3	6	5	3	5	1	3	1	4	3	4	1
18F	7	3	5	2	2	5	6	5	2	5	0	6	1	3	2	4	1
19F	7	2	5	3	5	3	6	4	3	4	1	6	1	2	1	0	0
20F	7	3	1	3	2	5	6	5	3	4	0	3	1	4	0	0	0
21F	7	1	0	3	2	5	0	2	3	5	1	2	1	2	1	4	0
22F	7	4	1	4	1	5	6	1	5	6	0	6	1	3	1	3	0
23M	7	3	5	3	1	4	0	0	0	4	0	5	0	2	0	0	0
24F	7	1	5	4	2	2	6	5	3	5	1	5	1	5	0	0	0
25M	4	3	5	4	2	5	6	5	3	4	1	3	1	3	1	5	0
26M	6	2	5	4	1	5	6	0	0	3	1	0	0	0	0	0	0
27M	3	1	2	2	2	5	5	0	3	4	0	4	1	3	0	2	0
28F	7	3	5	5	2	4	0	0	2	4	1	4	0	0	0	0	0
29F	7	0	1	2	5	4	5	0	0	3	1	5	7	2	0	0	0
30F	6	3	1	2	2	5	6	1	4	4	0	0	0	0	0	0	0
31M	6	2	2	2	1	5	4	0	1	3	1	2	7	1	1	5	0
32M	6	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	204	78	114	109	74	126	154	99	73	134	21	125	57	92	37	93	20