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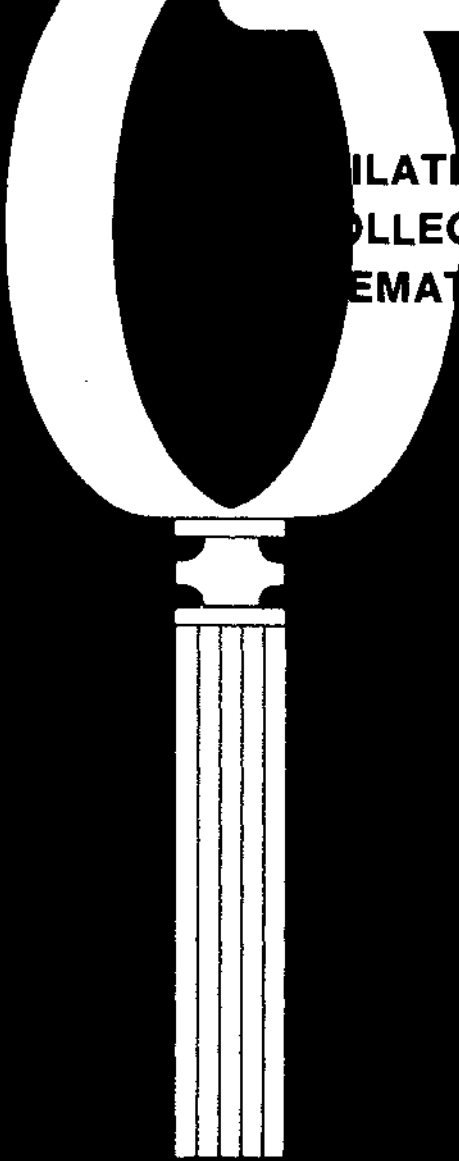
ABSTRACT

This volume presents an annotated listing of research reports related to the teaching of college mathematics. Included in the listing are 513 journal articles, 771 dissertations, and 74 other documents which were produced during the period from 1900 through 1974. A brief annotation indicates the focus of each research document and a major finding reported in it. The type of research level of students and number of subjects are indicated for each study. The research reports are indexed by mathematical content area and by research focus (e.g., individual differences, attitudes, teaching approaches). (SD)







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MATHEMATICS EDUCATION REPORTS

# Compilation of Research on College Mathematics Education

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## Mathematics Education Reports

Mathematics Education Reports are being developed to disseminate information concerning mathematics education documents analyzed at the ERIC Information Analysis Center for Science, Mathematics, and Environmental Education. These reports fall into three broad categories. Research reviews summarize and analyze recent research in specific areas of mathematics education. Resource guides identify and analyze materials and references for use by mathematics teachers at all levels. Special bibliographies announce the availability of documents and review the literature in selected interest areas of mathematics education. Reports in each of these categories may also be targeted for specific subpopulations of the mathematics education community. Priorities for the development of future Mathematics Education Reports are established by the Advisory Board of the Center, in cooperation with the National Council of Teachers of Mathematics, the Special Interest Group for Research in Mathematics Education, the Conference Board of the Mathematical Sciences, and other professional groups in mathematics education. Individual comments on past Reports and suggestions for future Reports are always welcomed by the editor.

With this compilation, there is now available a basic list of research reports on mathematics education in the United States at all age levels (see the footnote on page 2 for previous listings on elementary-school and secondary-school mathematics). While the collection is not completely comprehensive, it does provide a base to which may be added missing information.

Of even more importance, however, is the time-saving role a compilation can play for those who are seeking information on a particular aspect of mathematics education. The ERIC Information Analysis Center for Science, Mathematics and Environmental Education is pleased to make this publication available, with the hope that it will be of help to many seekers.

Jon L. Higgins
Associate Director
for Mathematics Education

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Compilation of Research

on College Mathematics Education

TABLE OF CONTENTS

## Compilation of Research on College Mathematics Education

This publication consists primarily of a listing of research reports on mathematics education in the United States at the college level.[1] It also includes some studies which were conducted with samples from other post-secondary-school populations. And research conducted with teacher education samples is also included when the focus of the research was on mathematical background or courses. [Such studies were also included in Suydam and Riedesel (1969) and Suydam (1972).]

The reports listed include journal articles, dissertations, and ERIC documents which were located for the years 1900 through 1974. No claim of comprehensiveness is made: while the search for existing reports was careful, it is likely that some studies have been overlooked, especially those from the early years and those in sources not available in entirety.

Articles and dissertations for five recent years, 1970 through 1974, have been annotated to indicate at least one finding that reflects the focus of the research. Generally there are other findings reported, and certainly there is more specificity in the report. The annotation merely serves to direct attention toward a major focus, as one way to help readers in deciding whether to secure the full report. In brackets following the annotation, three additional pieces of information are noted: type of study, size of sample, and level.[2]

To aid readers in locating studies on a particular topic, all documents listed have been categorized by mathematical topic. The index of topics appears on pages 239 through 284. Reports are listed in alphabetical order by type -- journal articles, beginning on page 3; dissertations, beginning on page 71; and ERIC documents, beginning on page 230. In all, 513 articles, 771 dissertations, and 74 ERIC documents are cited.

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[1] For previous listings of research on elementary-school and secondary-school mathematics, see:

(a) An Evaluation of Journal-Published Reports on Elementary School Mathematics, 1900-1965, Volumbes I and II, by Marilyn N. Suydam. Unpublished doctoral dissertation, The Pennsylvania State University, 1967. (Order No. 68-3563)

(b) Interpretive Study of Research and Development on Elementary School Mathematics, Phase I, by Marilyn N. Suydam and C. Alan Riedesel. Final Report, USOE, June 1969. Volume II, Compilation of Research Reports. (ERIC: ED 030 017)

(c) Annotated Compilation of Research on Secondary School Mathematics, 1930-1970, by Marilyn N. Suydam. Final Report, February 1972. Volume I, Introduction; Compilation of Articles. (ERIC: ED 062 165) Volume II, Compilation of Dissertations; Summary and Conclusions. (ERIC: ED 062 166)

(d) A Categorized Listing of Research on Mathematics Education (K-12), 1964-1973, by Marilyn N. Suydam. Columbus, Ohio: ERIC/SMEAC, August 1974. (ERIC: ED 097 225)

[2] For "type of study", letters indicate: a, action research; c, case study; d, descriptive; e, experimental; f, ex post facto; r, correlational; and s, survey.
For "level", the numerals 13, 14, 15, and 16 refer to the freshman, sophomore, junior, and senior levels, respectively (when reported).

1. LIST OF JOURNAL-PUBLISHED ARTICLES

Abe, Clifford. A Factor Analytic Study of Some Non-Intellectual Indices of Academic Achievement. Journal of Educational Measurement 3: 39-44; Spring 1966.

Abramson, David A. The Effectiveness of Grouping Students of High Ability. Educational Research Bulletin 38: 169-182; October 1959.

Adams, Sam and Von Brock, Robert C. The Development of the A-V Scale of Attitudes Toward Mathematics. Journal of Educational Measurement 4: 247-248; Winter 1967.

Ahern, Lorella. Scope of Mathematical Offerings in Selected Junior Colleges. Mathematics Teacher 35: 18-22; January 1942.

Ahmann, J. Stanley and Glock, Marvin D. An Evaluation of the Effectiveness of a Freshman Mathematics Course. Journal of Educational Psychology 50: 41-45; February 1959.

Aichele, Douglas B. Does a Terminal Mathematics Course Contribute to Changes in Attitudes Toward Mathematics? Journal for Research in Mathematics Education 2: 197-205; May 1971.

No significant difference was found between initial and end-of-course attitudes, although some differences on specific items were found. [--; 65 students; college]

Aiken, Lewis R., Jr. Personality Correlates of Attitude Toward Mathematics. Journal of Educational Research 56: 476-480; May/June 1963.

Aiken, Lewis R., Jr. Nonintellective Variables and Mathematics Achievement: Directions for Research. Journal of School Psychology 8: 28-36; March 1970.

Empirical studies on attitudes, anxiety, interests, and other personal and social factors affecting achievement in mathematics are discussed, with 31 references cited. [d; 31 references; elementary - college]

Aiken, Lewis R., Jr. Attitudes Toward Mathematics. Review of Educational Research 40: 551-596; October 1970.

Studies categorized by methods of measuring attitudes; distribution and stability of attitudes; the relationship of attitude to achievement and to personality and social factors; teacher characteristics, attitude, and behavior; instructional method and curriculum; and attitude development are discussed, with 109 references cited. [d; 109 references; elementary - college]

Aiken, Lewis R., Jr. Verbal Factors and Mathematics Learning: A Review of Research. Journal for Research in Mathematics Education 2: 304-313; November 1971.

The relationship of mathematical ability to reading ability and general intelligence, reading instruction and mathematics learning, and student and teacher verbalizations were discussed. [d; 26 references; elementary - college]

Aiken, Lewis R., Jr. Intellective Variables and Mathematics Achievement: Directions for Research. Journal of School Psychology 9: 201-212; 1971.

Research findings on general versus specific mathematical factors, age and sex differences, verbal and other abilities, and mathematical ability and method of instruction are discussed, with 60 references cited. [d; --; elementary - college]

Aiken, Lewis R., Jr. Biodata Correlates of Attitudes Toward Mathematics in Three Age and Two Sex Groups. School Science and Mathematics 72: 386-395; May 1972.

Mathematics attitude was found to be related to a wide range of biodata variables; many correlations varied with age and sex. For college freshmen, but not for eighth graders or graduate students, significant differences in attitude were found between sexes. [r; 182 students, 225 college freshmen, 124 graduate students; 8, college]

Aiken, Lewis R., Jr. Language Factors in Learning Mathematics. Review of Educational Research 42: 359-385; Summer 1972.

Reading, intelligence, vocabulary, verbal interaction, and the language of mathematics are among the factors considered in this research review. [d; --; elementary - college]

Aiken, Lewis R., Jr. Ability and Creativity in Mathematics. Review of Educational Research 43: 405-432; Fall 1973.

Studies related to types and factors of mathematical abiliry, the meaning and measurement of creativity, heredity and development in mathematical abilities, psychosocial factors, and education for mathematical creativity are reviewed. [d; --; elementary - college]

Aiken, Lewis R. Two Scales of Attitude Toward Mathematics. Journal for Research in Mathematics Education 5: 67-71; March 1974.

The reliability of the "enjoyment" scale was found to be .95, while that of the "value" scale was .85. [--; 185 students; 13]

Aiken, Lewis R., Jr. and Dreger, Ralph Mason. The Effect of Attitudes on Performance in Mathematics. Journal of Educational Psychology 52: 19-24; February 1961.

Alexander, F. D. Teaching Fundamental Concepts of Mathematics at the College Level by Closed-Circuit Television. Mathematics Teacher 56: 627-631; December 1963.

Alexander, F. D. An Experiment in Teaching Mathematics at the College Level by Closed-Circuit Television. American Mathematical Monthly 72: 312-313; March 1965.

Alspaugh, Carol Ann. Identification of Some Components of Computer Programming Aptitude. Journal for Research in Mathematics Education 3: 89-98; March 1972.

Scores on tests of temperament, programming aptitude, and critical thinking were found to be correlated with achievement in an introductory programming course. [r; 50 students; college]

Alspaugh, John W. The Relationship of Grade Placement to Programming Aptitude and FORTRAN Programming Achievement. Journal for Research in Mathematics Education 2: 44-48; January 1971.

High school students who had twice the number of hours of instruction learned FORTRAN as well as college students did. [a; 37 students; 11, 12, college]

Altus, William D. Correlative Data for First-Semester Grade Averages at the University of California, Santa Barbara. Journal of Genetic Psychology 98: 303-305; 1961.

Ameduri, Robert A. An Analysis of Student Grades in a University Physical Science Course for Pre-Nurses and Their High School Science and Mathematics Background. School Science and Mathematics 74: 251-254; March 1974.

Students with more high school mathematics background tended to receive higher grades in a physical science course. [r; 71 students; college]

Anderson, G. R.; Weaver, C. T.; and Wolf, C. T. Large Group Instruction in Elementary College Mathematics. American Mathematical Monthly 72: 179-181; 1965.

Anderson, James and Whittemore, Robert G. Predictive Utility of Certain Criteria for Advanced Freshman Mathematics Courses. Mathematics Teacher 60: 619-620; October 1967.

Andrew, Dean C. Predicting College Success of Non-High-School Graduates. School Review 60: 151-156; March 1952.

Arnett, L. D. Counting and Adding. American Journal of Psychology 16: 327-336; July 1905.

Arnold, H. J. College Students' Knowledge of Plane Geometry. School Science and Mathematics 30: 894-900; November 1930.

Arnold, H. J. Arithmetical Abilities and Disabilities of College Students. Elementary School Journal 31: 259-270; December 1930.

Arnold, H. J. Abilities and Disabilities of College Students in Elementary Algebra. Journal of Educational Research 23: 324-329; April 1931.

Atkinson, John W. and Reitman, Walter R. Performance as a Function of Motive Strength and Expectancy of Goal-Attainment. Journal of Abnormal and Social Psychology 53: 361-366; 1956.

Austin, Joe Dan. An Experimental Study of the Effects of Three Instructional Methods in Basic Probability and Statistics. Journal for Research in Mathematics Education 5: 146-154; May 1974.

Significant differences generally favored the group having a manipulative-pictorial or pictorial approach over a symbolic approach. [e; 71 students; college]

Ausubel, David P. The Use of Advanced Organizers in the Learning and Retention of Meaningful Verbal Learning. Journal of Educational Psychology 51: 267-272; October 1960.

Ayre, H. G. On the Status of Teaching Load, Salary, and Professional Preparation of Junior College Mathematics Teachers. Mathematics Teacher 43: 54-60; February 1950.

Baer, Daniel J. and Ragosta, Teresa A. Relationship Between Perceived Child-Rearing Practices and Verbal and Mathematical Ability. Journal of Genetic Psychology 108: 105-108; 1966.

Baggaley, Andrew R. and Campbell, James P. Multiple-Discriminant Analysis of Academic Curricula by Interest and Aptitude Variables. Journal of Educational Measurement 4: 143-149; Fall 1967.

Bailey, H. W. Trigonometry in the High School. Mathematics Teacher 25: 303-308; May 1932.

Barnes, Kenneth; Cruickshank, Raymond; and Foster, James. Selected Educational and Experience Factors and Arithmetic Teaching. Arithmetic Teacher 7: 418-420, 430; December 1960.

Bartz, Wayne H. and Darby, Charles L. The Effects of a Programed Textbook on Achievement Under Three Techniques of Instruction. Journal of Experimental Education 34: 46-49; March 1966.

Bassham, Harrell. Teacher Understanding and Pupil Efficiency in Mathematics - A Study of Relationship. Arithmetic Teacher 9: 383-387; November 1962.

Bassler, Otto C. An Investigation of the Effect of Types of Exercises on Mathematics Learning. Mathematics Teacher 59: 266-273; March 1966.

Baum, John D. Mathematics, Self-Taught. American Mathematical Monthly 65: 701-705; November 1958.

Bean, John E. Arithmetical Understandings of Elementary-School Teachers. Elementary School Journal 59: 447-450; May 1959.

Beenken, May M. et al. College Mathematics for Non-Science Students. American Mathematical Monthly 63: 639-642; November 1956.

Benson, Richard O. Immediate Knowledge of Results and Test Performance. Journal of Educational Research 66: 224-226; January 1973.

No significant differences between groups having immediate or delayed knowledge of results were found in means on one-hour tests; on the final examination, differences significantly favored immediate reinforcement. [e; 3 classes (75 students); junior high, college]

Behr, Anthony N. Achievement, Aptitude and Attitude in Mathematics. Two-Year College Mathematics Journal 4: 72-74; Spring 1973.

Male students had greater aptitude and interest in mathematics, but did not achieve better than female students. [s; 323 students; 13 (community college)]

Behr, Merlyn J. Interactions Between "Structure-of-Intellect" Factors and Two Methods of Presenting Concepts of Modular Arithmetic - A Summary Paper. Journal for Research in Mathematics Education 1: 29-42; January 1970.

Significant interactions were found between method of instruction and a figural factor on the time criterion; between method and three semantic factors on learning and retention criteria; and between method and another semantic factor on the time criterion. [e; 228 students; elementary pre-service]

Benner, Charles P. and Rogers, Curtis A. A New Plan for Instructing Large Classes in Mathematics by Television and Films. Mathematics Teacher 53: 371-375; May 1960.

Bennett, Raymond D. Trends in the Amount of Mathematics and Science Taken in High School. School Review 52: 406-412; September 1944.

Benz, Harry E. Students Entering College Without Credit in High-School Mathematics. School Review 54: 334-341; June 1946.

Berdie, R. F. Aptitude, Achievement, Interest, and Personality Tests: A Longitudinal Comparison. Journal of Applied Psychology 39: 103-114; April 1955.

Bergen, Catherine. The Prevalence of Mathematics in Science From 1900 to 1950. School Science and Mathematics 51: 443-446; June 1951.

Bergen, M. C. Achievement of Students in College Algebra Compared with the Number of Semesters of Preparation in High School. School Science and Mathematics 38: 763-765; October 1938.

Bergen, M. C. Comparison of Grades in College Trigonometry Between Students Who Had the High School Course and Those Who Did Not. School Science and Mathematics 39: 273-274; March 1939.

Bergen, M. C. Engineering Students Versus Other Students in Freshman College Mathematics. Mathematics Teacher 36: 159-163; April 1943.

Berger, I. L. and Sutker, A. R. The Relationship of Emotional Adjustment and Intellectual Capacity to Academic Achievement of College Students. Mental Hygiene 40: 65-77; 1956.

Berger, Margaret L. Provisions for Meeting the Needs of the Poorly Prepared Student in Algebra. Mathematics Teacher 43: 107-111; March 1950.

Bhushan, Vidya. The Effectiveness of Two Methods of Teaching Elementary Matrix Algebra. Journal of Experimental Education 35: 36-43; September 1966.

Bittinger, Marvin L. and Rudolph, William B. The Effect of a Unit of Proof on Subsequent Mathematical Performance. Journal of Educational Research 67: 339-341; April 1974.

No significant differences were found between groups using or not using a unit on proof-writing. [e; 62 students; college]

Blount, William R. Naive Male Retardates and U.S. Moneys: An Exploratory Study. American Journal of Mental Deficiency 72: 487-491; November 1967.

Boldt, R. F. Comparability of Scores From Different Tests Though on the Same Scale. Educational and Psychological Measurement 34: 239-246; Summer 1974.

Caution is expressed about comparing data from different tests, with mathematics as well as many other tests cited. [d; --; college]

Bompart, Bill. An Undergraduate Program Based on Certification Requirements. School Science and Mathematics 70: 805-812; December 1970.

Courses required in the various states were compiled; a program which would meet the requirements of all was not possible, but four- and five-year programs were suggested. [s; --; secondary preservice]

Bowerman, William R. Comparison of Ability in Mathematics. Psychological Reports 32: 849-850; June 1973.

Students ranked themselves least favorably on ability in mathematics, compared with reading and creative thinking. [s; 93 students; college]

Bowers, John. The Comparison of GPA Regression Equations for Regularly Admitted and Disadvantaged Freshmen at the University of Illinois. Journal of Educational Measurement 7: 219-225; Winter 1970.

Regression equations, which included a quantitative score, were significantly different for regularly and specially admitted students. [r; 515 students; 13]

Boyer, Lee Emerson. The Utility of Analytic Geometry Concepts to Secondary School Teachers of Mathematics, Science and Industrial Arts. Journal of Experimental Education 5: 356-367; June 1937.

Bradley, L. K.; Newell, C. R.; and Williams, V. M. The Relationship Between the Performance of the Texas Southern University Freshmen on the Mathematics Placement Test and Their High School Mathematics Background. American Mathematical Monthly 73: 188-190; February 1966.

Brandenburg, W. J. Modernization of School Mathematics in Holland. American Mathematical Monthly 74: 57-60; January 1967.

Brant, Vincent. Is Solid Geometry an Entrance Requirement for Engineering Schools? Mathematics Teacher 53: 564-570; November 1960.

Brekke, Beverly and Williams, John D. Conservation of Weight with the Mentally Retarded. Journal of Genetic Psychology 125: 225-231; December 1974.

Normal learners scored higher at each mental age level than did retarded learners. [s; 231 pupils; ages 6-27 (MRs)]

Bright, George W. and Carry, L. Ray. The Influence of Professional Reference Groups on Decisions of Preservice Secondary School Mathematics Teachers. Journal for Research in Mathematics Education 5: 87-97; March 1974.

Pre-service teachers were found to be influenced in making choices by the labels "mathematician" and "educator," although no significant differential influence between the two was found. [e; 61 students; secondary pre-service]

Brown, F. G. and Scott, D. A. Differential Predictability in College Admissions Testing. Journal of Educational Measurement 4: 163-166; Fall 1967.

Brown, John A. and Mayor, John R. The Academic and Professional Training of Teachers of Mathematics. Review of Educational Research 31: 296-304; June 1961.

Brown, John D. An Evaluation of the Spitz Student Response System in Teaching a Course in Logical and Mathematical Concepts. Journal of Experimental Education 40: 12-20; Spring 1972.

Attitudes toward the response system were favorable, and achievement showed some increase. [a; 75 students; college]

Brown, Kenneth E. Is General Mathematics in the College on Its Way Out? Mathematics Teacher 41: 154-158; April 1948.

Brown, Kenneth E. The Content of a Course in General Mathematics - Teachers' Opinions. Mathematics Teacher 43: 25-30; January 1950.

Brown, Kenneth E. Teaching Load and Qualifications of Mathematics Teachers. Mathematics Teacher 53: 2-11; January 1960.

Brown, Kenneth E. Qualifications and Teaching Loads of Mathematics and Science Teachers. American Mathematical Monthly 67: 684-686; September 1960.

Brown, Robert S. Survey of Ohio College Opinions with Reference to High School Mathematics Programs. Mathematics Teacher 56: 245-247; April 1963.

Bryson, Rebecca. Teacher Evaluations and Student Learning: A Reexamination. Journal of Educational Research 68: 12-14; September 1974.

Students' evaluations of their instructors were correlated with amount learned. [r; 20 sections (582 students); college]

Buchanan, O. Lexton, Jr. Opinions of College Teachers of Mathematics Regarding Content of the Twelfth-Year Course in Mathematics. Mathematics Teacher 58: 223-225; March 1965.

Buckingham, B. R. Adding Up or Down: A Discussion. Journal of Educational Research 12: 251-261; November 1925.

Burnett, Collins and MacMinn, Paul. A Comparison of Teacher Education Students and Non-Teacher Education Students on Measures of Academic Aptitude and Achievement. Journal of Teacher Education 17: 312-316; Fall 1966.

Burnham, Paul S. and Hewitt, Benjamin A. Advanced Placement Scores: Their Predictive Validity. Educational and Psychological Measurement 31: 939-945; Winter 1971.

Advanced Placement Score had predictive validity for some mathematics courses. [r; --; college]

Byrkit, Donald R. Using Televised and Aural Materials for Mathematics Teachers. Mathematics Teacher 64: 519-524; October 1971.

For a lesson on number theory, the use of television resulted in higher scores, but possibly was not more effective than audiotape presentation. [e; 54 teachers; secondary in-service (junior high)]

Caldwell, Edward and Hartnett, Rodney. Sex Bias in College Grading? Journal of Educational Measurement 4: 129-132; Fall 1967.

Canisia, Sister M. Mathematical Ability as Related to Reasoning and Use of Symbols. Educational and Psychological Measurement 22: 105-127; 1962.

Cargill, David M. Mathematics Important to Non-Mathematics Teachers. Journal of Education 136: 162-164; March 1954.

Carson, T. E. and Wheeler, L. R. Rehabilitation in Arithmetic with College Freshmen. Peabody Journal of Education 8: 24-27; July 1930.

Carter, H. D. Family Resemblance in Verbal and Numerical Abilities. Genetic Psychology Monographs 12: 1-102; July 1932.

Casner, A. and Nyberg, J. What Do High School Graduates Know About Arithmetic? Journal of Business Education 15: 17-18; September 1939.

Cattell, R. B. Personality Traits Associated with Abilities. II: With Verbal and Math Abilities. Journal of Educational Psychology 36: 475-486; 1945.

Chase, Sara E. Waste in Arithmetic. Teachers College Record 18: 360-370; September 1917.

Chen, Tso-Yu L. and Chow, Huai-Hsui. Factor Study of a Test Battery at Different Educational Levels. Journal of Genetic Psychology 73: 187-199; December 1948.

Childs, G. B. Success in Initial University Mathematics Courses of Students with Correspondence and Non-Correspondence Background in High School Mathematics. Journal of Educational Research 49: 607-612; 1956.

Christofferson, H. C. College Freshmen and Problem Solving in Arithmetic. Journal of Educational Research 21: 15-20; January 1930.

Ciborowski, Tom and Cole, Michael. A Cross-Cultural Study of Conjunctive and Disjunctive Concept Learning. Child Development 43: 774-789; September 1972.

Conjunctive concepts were easier than disjunctive concepts in a wide variety of measures. The performance of both cultural groups was strikingly similar. [f; --; ages 8-24]

Clark, Herbert H. Linguistic Processes in Deductive Reasoning. Psychological Review 76: 387-404; January 1969.

Clark, W. H. Mathematics Offered to Commerce and Administration Students in Junior Colleges. School Science and Mathematics 41: 340-345; April 1941.

Cleary, T. Anne. Test Bias: Prediction of Grades of Negro and White Students in Integrated Colleges. Journal of Educational Measurement 5: 115-124; Summer 1968.

Coit, Wilbur Alden. A Preliminary Study of Mathematical Difficulties. School Review 36: 504-509; September 1928.

Coit, Wilbur A. The Demons of Elementary Mathematics. School Science and Mathematics 29: 50-58; January 1929.

Cole, L. W. Adding Upward and Downward. Journal of Educational Psychology 3: 83-94; February 1912.

Collier, C. Patrick. Prospective Elementary Teachers' Intensity and Ambivalence of Beliefs About Mathematics and Mathematics Instruction. Journal for Research in Mathematics Education 3: 155-163; May 1972.

Students who have completed the mathematics education program had more informal views of mathematics and mathematics instruction, and their beliefs were less ambivalent, than students beginning their programs. High and low achievers differed similarly. [s; 264 students; elementary pre-service]

Combs, Louise. Summary of Study of Certification Requirements in Mathematics for Elementary Teachers in the 50 States. American Mathematical Monthly 70: 428-433; April 1963.

Committee on the Undergraduate Program in Mathematics. Preparation in Mathematics for Elementary School Teachers. Arithmetic Teacher 14: 198-199; March 1967.

Cook, Kermit A. Effect of Two Patterns of High-School Training on College Achievement. School Review 59: 164-167; March 1951.

Corle, Clyde G. Estimates of Quantity by Elementary Teachers and College Juniors. Arithmetic Teacher 10: 347-352; October 1963.

Craig, Robert C. Discovery, Task Completion, and the Assignment as Factors in Motivation. American Educational Research Journal 2: 217-222; November 1965.

Creswell, John L. The Competence in Arithmetic of Prospective Georgia Elementary Teachers. Arithmetic Teacher 11: 248-250; April 1964.

Creswell, John L. How Effective Are Modern Mathematics Workshops? Arithmetic Teacher 14: 205-208; March 1967.

Cristantiello, P. D. Attitude Toward Mathematics and the Predictive Validity of a Measure of Quantitative Aptitude. Journal of Educational Research 55: 184-186; December 1961.

Crittenden, William B. Training Elementary Mathematics Teachers in a One-Semester Course. Arithmetic Teacher 21: 428-432; May 1974.

Students in a field-based program gained significantly in knowledge of mathematics and teaching methods. Pupils they taught evidenced no significant difference in achievement or attitude. [a; --; elementary pre-service]

Cronbach, Lee J. What the Word "Function" Means to Algebra Teachers. Mathematics Teacher 36: 212-218; May 1943.

Cummins, Kenneth. A Student Experience-Discovery Approach to the Teaching of Calculus. Mathematics Teacher 53: 162-170; March 1960.

Dahlke, Richard M. Determining the Best Predictors of Success and of Time of Completion or Dropout in an Individualized Course in Arithmetic at a Community College. Journal for Research in Mathematics Education 5: 213-223; November 1974.

Students' pre-course achievement in arithmetic computation was the best predictor of success and the third best predictor of completion of the course. [r; 113 students; community college]

Davis, T. A. An Experiment in Teaching Mathematics at the College Level by Programmed Instruction. American Mathematical Monthly 73: 656-659; June 1966.

Davis, William E. Effect of Prior Failure on Subjects' WAIS Arithmetic Subtest Scores. Journal of Clinical Psychology 25: 72-73; January 1969.

Davis, William E.; Peacock, William; Fitzpatrick, Philip; and Mulhern, Michael. Examiner Differences, Prior Failure, and Subjects' WAIS Arithmetic Scores. Journal of Clinical Psychology 26: 178-180; 1970.

Performance on the arithmetic test significantly decreased after students experienced failure on another test. [e; 90 students; college]

Dessart, Donald J. Characteristics and Service Loads of Mathematics and Science Teachers. American Mathematical Monthly 71: 550-552; May 1964.

Dick, Walter. Retention as a Function of Paired and Individual Use of Programmed Instruction. Mathematics Teacher 58: 649-654; November 1965.

Dickter, M. Richard. The Relationship Between Scores on the Scholastic Aptitude Test and College Grades in Mathematics. Journal of Educational Psychology 29: 363-373; May 1938.

Dizney, Henry F.; Merrifield, Philip R.; and Davis, O. L., Jr. Effects of Answer-Sheet Format on Arithmetic Test Scores. Educational and Psychological Measurement 26: 491-493; Summer 1966.

Dobyns, Roy A. An Experiment in the Teaching of College Algebra. Mathematics Teacher 52: 319-325; 1964.

Dossey, John A. and Henderson, Kenneth B. The Relative Effectiveness of Four Strategies for Teaching Disjunctive Concepts in Mathematics. Journal for Research in Mathematics Education 5: 6-19; January 1974.

Significant differences between strategies were found on items measuring attainment at the Application and Analysis-Synthesis-Evaluation levels. Students performed better on exclusive concepts than on inclusive concepts, and attained geometric disjunctive concepts more easily than algebraic disjunctive concepts. [e; 320 students; elementary pre-service]

Douglass, Harl R. Psychology and Methods in the High School and College: Mathematics. Review of Educational Research 4: 479-488, 531-533; December 1934.

Douglass, Harl R. and Michaelson, Jessie H. The Relation of High-School Mathematics to College Marks and of Other Factors to College Marks in Mathematics. School Review 44: 615-619; October 1936.

Douthitt, Cameron. The Effects of a Laboratory on Achievement in College Freshman Mathematics. Two-Year College Mathematics Journal 4: 55-59; Winter 1973.

Use of a mathematics laboratory produced higher achievement and less attrition by poorer students. [e; --; 13]

Dreger, Ralph Mason and Aiken, Lewis R., Jr. The Identification of Number Anxiety in a College Population. Journal of Educational Psychology 48: 344-351; October 1957.

Drushel, J. A. A Study of the Amount of Arithmetic at the Command of High School Graduates Who Have Had No Arithmetic in Their High-School Course. Elementary School Journal 17: 657-661; May 1917.

Dunn, James E. A Study of the University of Arkansas Mathematics Entrance Exam as a Placement Device. Journal of Experimental Education 34: 62-68; Spring 1966.

Durflinger, Glenn W. The Fundamentals Forgotten by College Students. Journal of Educational Research 49: 571-579; April 1956.

Dutton, Wilbur H. Attitudes of Prospective Teachers Toward Arithmetic. Elementary School Journal 52: 84-90; October 1951.

Dutton, Wilbur H. Measuring Attitudes Toward Arithmetic. Elementary School Journal 55: 24-31; September 1954.

Dutton, Wilbur H. University Students' Comprehension of Arithmetical Concepts. Arithmetic Teacher 8: 60-64; February 1961.

Dutton, Wilbur H. Attitude Change of Prospective Elementary School Teachers Toward Arithmetic. Arithmetic Teacher 9: 418-424; December 1962.

Dutton, Wilbur H. Prospective Elementary School Teachers' Understanding of Arithmetical Concepts. Journal of Educational Research 58: 362-365; April 1965.

Dutton, Wilbur H. Individualizing Instruction in Elementary School Mathematics for Prospective Teachers. Arithmetic Teacher 13: 227-231; March 1966.

Dutton, Wilbur H. and Cheney, Augustine P. Pre-Service and In-Service Education of Elementary School Teachers in Arithmetic. Arithmetic Teacher 11: 192-198; March 1964.

Dutton, Wilbur H. and Hammond, H. Reginald. Two In-Service Mathematics Programs for Elementary School Teachers. California Journal of Educational Research 17: 63-67; March 1966.

Dwight, Leslie A. TV In-Service Mathematics Programs for Elementary Teachers. Arithmetic Teacher 12: 644, 656; December 1965.

Dyer-Bennet, John; Fuller, William R.; Seibert, Warren F.; and Shanks, Merrill E. Teaching Calculus by Closed-Circuit Television. American Mathematical Monthly 65: 430-439; June 1958.

Edwards, A. S. A Mathematics Vocabulary Test and Some Results of an Examination of University Freshmen. Journal of Educational Psychology 27: 694-697; December 1936.

Eells, Walter Crosby and Fox, Clement S. Sex Differences in Mathematical Achievement of Junior College Students. Journal of Educational Psychology 23: 381-386; May 1932.

Egan, Dennis E. and Greeno, James G. Acquiring Cognitive Structure by Discovery and Rule Learning. Journal of Educational Psychology 64: 85-97; February 1973.

Students acquired concepts of probability by discovery or rule versions of programmed instruction. Differences in needed skills and outcomes for each were all noted. [e; I: 57 students, II: 72 students; college]

Ehrenpreis, Walter and Scandura, Joseph M. The Algorithmic Approach to Curriculum Construction: A Field Test in Mathematics. Journal of Educational Psychology 66: 491-498; August 1974.

The discrete-rules curriculum was cut from 303 lower-order rules to 169 rules plus five higher-order rules by a higher-order curriculum. [a; --; college]

Eisenberg, Theodore A. and McGinty, Robert L. On Comparing Error Patterns and the Effect of Maturation in a Unit on Sentential Logic, Journal for Research in Mathematics Education 5: 225-237; November 1974.

Only on certain forms of questions did maturation appear to be a factor in logical reasoning ability. With some items in sentential logic, maturation seemed to hinder logical reasoning. [s; 154 students, 100 pupils; 2, 3, pre-service]

Elliott, H. Margaret. Teaching Freshman Mathematics by Television. American Mathematical Monthly 65: 440-443; June 1958.

Estes, Betsy Worth. Judgment of Size in Relation to Geometric Shape. Child Development 32: 277-286; 1961.

Filano, Albert E. The Ability of College Freshmen to Read Mathematics Texts Independently with Understanding. School Science and Mathematics 57: 16-18; January 1957.

Fincher, Cameron. Is the SAT Worth Its Salt? An Evaluation of the Scholastic Aptitude Test in the University System of Georgia Over a Thirteen-Year Period. Review of Educational Research 44: 293-305; Summer 1974.

Percentages that mathematics and other SAT scores contributed to prediction estimates were computed. [r; --; college]

Fisher, John J. Extent of Implementation of C.U.P.M., Level I Recommendations. Arithmetic Teacher 14: 194-197; March 1967.

Fisher, J. J. The Extent of Implementation of Level I and Level III CUPM Recommendations, Panel on Teacher Training. American Mathematical Monthly 75: 290-292; March 1968.

Flanagan, S. Stuart. The Effects of SMSG Texts on Students' First Semester Grade in College Mathematics. School Science and Mathematics 69: 817-820; December 1969.

Flaugher, Ronald L. and Rock, Donald A. A Multiple Moderator Approach to the Identification of Over- and Underachievers. Journal of Educational Measurement 6: 223-228; Winter 1969.

Foberg, J. A. The Effect of Courses in 'The Teaching of Arithmetic' Upon Arithmetic Skills. Journal of Educational Research 21: 74-77; January 1930.

Francis, Richard L. A Placement Study in Analytic Geometry and Calculus. Educational and Psychological Measurement 26: 1041-1046; Winter 1966.

Frederiksen, Norman. Predicting Mathematics Grades of Veteran and Non-veteran Students. Educational and Psychological Measurement 9: 73-88; Spring 1949.

Frederiksen, Norman and Satter, G. A. The Construction and Validation of an Arithmetical Computation Test. Educational and Psychological Measurement 13: 209-227; Summer 1953.

Freeman, Frank N. Grouped Objects as a Concrete Basis for the Number Idea. Elementary School Teacher 12: 306-314; 1912.

French, John W. The Kinds of Items That Work in an Interest Activities Index. American Educational Research Journal 2: 101-112; March 1965.

Fujita, George Y. and O'Reilly, Joseph P. A Two-Stage Sequential Strategy in the Placement of Students in an Undergraduate Mathematics Curriculum. Journal for Research in Mathematics Education 1: 241-250; November 1970.

The developed strategy resulted in better pradictive scores than other strategies. [r; 785 students; 13]

Fulkerson, Elbert. How Well Do 158 Prospective Elementary Teachers Know Arithmetic? Arithmetic Teacher 7: 141-146; March 1960.

Gaston, Jane A. and Kolb, John R. A Comparison of Three Strategies for Teaching a Selected Mathematical Concept to Students in College Algebra. Journal for Research in Mathematics Education 4: 177-186; May 1973.

Mean achievement of the exemplification group was significantly greater than the average of the means of the characterization-followed-by-exemplification group and the characterization-preceded-and-followed-by-exemplification group. [r; 39 students; community college]

Gavurin, Lester L. Two NSF-Supported Projects for Teachers of Advanced Placement Calculus. Mathematics Teacher 64: 361-366; April 1971.

Few additional schools added calculus courses after teachers participated in an institute, but 12 per cent added calculus to existing courses. [s; 50 teachers; secondary in-service]

Gear, Williard. Are High Schools Underemphasizing Trigonometry? School Science and Mathematics 49: 72-75; January 1949.

Geiselmann, Harrison. Mathematical Deficiencies of College Freshmen. Mathematics Teacher 49: 22-25; January 1956.

Georges, J. S. Mathematics in the Scheme of General Education. I, School Science and Mathematics 31: 1056-1067; December 1931. II, 32: 57-64; January 1932.

Gibney, Thomas G.; Ginther, John L.; and Pigge, Fred. The Mathematical Understandings of Preservice and In-Service Teachers. Arithmetic Teacher 17: 155-162; February 1970.

On a 65-item test (KR-21 reliability of .80), pre-service teachers scored significantly higher, with significant differences generally on subtests for "modern" topics. Significant differences were found in favor of pre-service teachers in grades 1-4, while for in-service teachers, the higher the grade level, the higher the mean score. [s; 887 pre-service, 177 in-service (1064); elementary pre- and in-service]

Gibney, Thomas G.; Ginther, John L.; and Pigge, Fred L. What Influences the Mathematical Understanding of Elementary-School Teachers? Elementary School Journal 70: 367-372; April 1970.

No significant differences among teachers grouped by size of community in which they desired to teach or were teaching were found. The mean score of those who preferred to teach mathematics was significantly greater than scores of those who preferred language arts, science, or social science; those who preferred mathematics least scored significantly lower. [s; 1077 teachers; elementary in-service]

Gibney, Thomas C.; Ginther, John L.; and Pigge, Fred L. A Comparison of the Number of Mathematics Courses Taken by Elementary Teachers and Their Mathematical Understandings. School Science and Mathematics 70: 377-381; May 1970.

As the amount of mathematics in high school, college, and on modern topics increased, scores increased. [f; 1050 teachers; elementary in-service]

Gilliland, A. R. and Humphreys, Dorothy Windes. Age, Sex, Method, and Interval as Variables in Time Estimation. Journal of Genetic Psychology 63: 123-130; 1943.

Glennon, Vincent Joseph. A Study of the Growth and Mastery of Certain Basic Mathematical Understandings on Seven Educational Levels. Harvard Educational Review 19: 62-64; Winter 1949.

Glennon, Vincent J. A Study of Needed Redirection in the Preparation of Teachers of Arithmetic. Mathematics Teacher 42: 389-396; December 1949.

Gluckaman, Marc D. The Use of Retesting as a Teaching Device in an Elementary Algebra Course. School Science and Mathematics 73: 725-729; December 1973.

No significant differences were found between a class allowed retesting on unit tests and a class which took the unit test only once. [e; 500 students (2 classes); junior college]

Goddard, Alton R. Recency of Secondary School Mathematical Preparation as an Influence on First-Year College Mathematics Achievement. Journal of Educational Research 64: 443-447; July-August 1971.

Achievement of students who had received mathematical credit during their last year in high school was significantly greater than students who had not attempted a mathematics course in grade 12. [f; 400 students; 13]

Goff, G. K. An Oklahoman Reports. American Mathematical Monthly 75: 1004-1005; November 1968.

Goldman, Roy D.; Schmidt, Donald E.; Hewitt, Barbara Newlin; and Fisher, Ronald. Grading Practices in Diffarent Major Fields. American Educational Research Journal 11: 343-357; Fall 1974.

GPAs for mathematics and other students were computed to astimate how they would be graded in another subject field. [r; 902 students; college]

Goldstone, Sanford; Boardman, William K.; and Lhamon, William T. Kinesthetic Cues in the Development of Time Concepts. Journal of Genetic Paychology 93: 185-190; October 1958.

Gorman, Frank H. The Arithmetic Vocabulary of the Elementary-School Teacher. Elementary School Journal 38: 373-379; January 1938.

Griffin, F. L. An Experiment in Correlating Freshman Mathematics. American Mathematical Monthly 22: 325-330; December 1915.

Grossnickle, Foster E. An Experiment with a One-Figure Divisor in Short and Long Division. I. Elementary School Journal 34: 496-506; March 1934. II. 34: 590-599; April 1934.

Grossnickle, Foster E. Reliability of Diagnosis of Certain Types of Errors in Long Division with a One-Figure Divisor. Journal of Experimental Education 4: 7-16; Septembar 1935.

Grossnickle, Foster E. Transfer of Knowledge of Multiplication Facts to Their Use in Long Division. Journal of Educational Research 29: 677-685; May 1936.

Grossnickle, Foster E. Growth in Mathematical Ability Among Prospective Teachers of Arithmetic. Arithmetic Teacher 9: 278-279; April 1962.

Guertin, Wilson H. The Effect of Instructions and Item Ordar on the Arithmetic Subtest of the Wechsler-Bellevue. Journal of Genetic Psychology 85: 79-83; 1954.

Guetzkow, H.; Kelly, E. L.; and McKeachie, W. J. An Experimental Comparison of Recitation, Discussion, and Tutorial Methods in College Teaching. Journal of Educational Psychology 45: 193-207; 1954.

Guggenbuhl, Laura. The Failure in Required Mathematics at Hunter College. Mathematics Teacher 30: 68-75; February 1937.

Guiler, Walter Scribner. Computational Errors Made By Teachers of Arithmetic. Elementary School Journal 33: 51-58; September 1932.

Guiler, Walter Scribner. Difficulties Encountered by College Freshmen in Fractions. Journal of Educational Research 39: 102-115; October 1945.

Guiler, W. S. Difficulties Encountered in Percentage by College Freshmen. Journal of Educational Research 40: 81-95; 1946.

Guiler, W. S. Difficulties Encountered by College Freshmen in Decimals. Journal of Educational Research 40: 1-13; September 1946.

Gundlach, W. B. An Investigation of Mathematics Teachers in Minnesota. Mathematics Teacher 34: 258-265; October 1941.

Gussett, James C. College Entrance Examination Board Scholastic Aptitude Test Scores as a Predictor for College Freshman Mathematics Grades. Educational and Psychological Measurement 34: 953-955; Winter 1974.

Correlations with earned mathematics grades were .48 with SATV, .62 with SAT-M, and .63 with SAT-T. [r; 142 women; 13]

Habel, E. A. Deficiencies of College Freshmen in Arithmetic: Diagnosis and Remedy. School Science and Mathematics 50: 480-484; June 1950.

Habel, E. A. An Experiment in the Diagnosis and Remedy of Errors of College Freshmen in Arithmetic and Radicals. School Science and Mathematics 51: 105-113; February 1951.

Hall, Jack V. Business Uses of Mental Arithmetic in Ellensburg, Washington. Journal of Educational Research 46: 365-369; January 1953.

Hall, Keith A. Inservice Mathematics Education for Elementary School Teachers Via Computer Assisted Instruction. Educational Technology 14: 59-61; April 1974.

Achievement improved when teachers used a mobile-laboratory CAI course on mathematics methods and content. [a; 342 teachers; elementary in-service]

Hamilton, E. W. Number Systems, Fad or Foundation? Arithmetic Teather 8: 242-245; May 1961.

Hannon, H. The Mastery of Certain Aspects of Mathematics for General Education by College Students. Journal of Educational Research 50: 363-371; 1957.

Hansen, Richard and Neujahr, James. Career Development of Males and Females Gifted in Science. Journal of Educational Research 68: 43-45; September 1974.

Boys gifted in science scored significantly higher than girls on mathematics and science standardized tests. [f; 301 students; secondary (college)]

Hardgrove, Clarence E. and Jacobson, Bernard. CUPM Report on the Training of Teachers of Elementary School Mathematics. Arithmetic Teacher 11: 89-93; February 1964.

Harper, E. Harold. Elementary Teachers' Knowledge of Basic Arithmetic Concepts and Symbols. Arithmetic Teacher 11: 543-546; December 1964.

Harris, Mary B. and Liguori, Ralph A. Some Effects of a Personalized System of Instruction in Teaching College Mathematics. Journal of Educational Research 68: 62-66; October 1974.

Ho significant differences were found between two types of mastery approach and a lecture approach. Students for whom the final exam score counted toward grades had significantly higher scores on the final. [e; 82 students; college]

Hartung, Maurice L. Teaching of Mathematics in High School and Junior College. Review of Educational Research 15: 310-320; October 1945.

Haslerud, G. M. and Meyers, Shitley. The Transfer Value of Given and Individually Derived Principles. Journal of Educational Psychology 49: 293-298; December 1958.

Hedley, Carolyn Neal. The Relationship of Personality Factors to Scientific and Mathematical Ability Factors. School Science and Mathematics 68: 265-271; April 1968.

Heimer, R. T. A Teach-Test Procedure for Obtaining Measures of Mathematical Aptitude. American Mathematical Monthly 73: 883-889; October 1966.

Henderson, Harold L. Predictors of Freshmen Grades in a Long Island College. Educational and Psychological Measurement 17: 623-627; Winter 1957.

Hendrix, Gertrude. A New Clue to Transfer-of-Training. Elementary School Journal 48: 197-208; December 1947.

Hennemann, Willard W. and Geiselmann, Harrison A. Using Ptogrammed Learning in the College Classtoom: A Case History. Mathematics Teacher 62: 27-32; January 1969.

Henry, Lyle K. The Performance on Adults of Various Grade Levels in Specific Mental Functions: A Grade-by-Grade Comparison with School Pupils. Journal of Educational Research 33: 93-101; October 1939.

Hicks, Randall C. Elementary Series and Texts for Teachers - How Well Do They Agree? Atithmetic Teacher 15: 266-270; March 1968.

Hicks, Randall C. and Perrodin, Alex F. Topics in Mathematics for Elementary School Teachers. School Science and Mathematics 47: 739-744; November 1967.

Hill, George E. The Vocational Uses of Elementary High School Algebra. School Science and Mathematics 32: 641-643; June 1932.

Hill, Shirley. Cultural Differences in Mathematical Concept Learning. American Anthropologist 66: 201-222; June 1964.

Hills, J. R. Factor Analyzed Abilities and Success in College Mathematics. Educational and Psychological Measurement 17: 615-622; Winter 1957.

Hills, John R. Prediction of College Grades for All Public Colleges of a State. Journal of Educational Measurement 1: 155-159; December 1964.

Hills, John R. and Gladney, Marilyn B. Predicting Grades From Below Chance Test Scores. Journal of Educational Measurement 5: 45-53; Spring 1968.

Hively, Wells, II; Patterson, Harry L.; and Page, Sara H. A "Universe-Defined" System of Arithmetic Achievement Tests. Journal of Educational Measurement 5: 275-290; Winter 1968.

Horn, Joseph M. and Turner, Robert Gerald. Personality Correlates of Differential Abilities in a Sample of Lower Than Average Ability. Psychological Reports 35: 1211-1220; December 1974.

Masculinity was related to the high mathematical-low verbal ability complex for females but not for males. [r; 405 students; college]

Houston, W. Robert; Boyd, Claude C.; and DeVault, M. Vere. An In-Service Mathematics Education Program for Intermediate Grade Teachers. Arithmetic Teacher 8: 65-68; February 1961.

Houston, W. Robert and DeVault, M. Vere. Mathematics In-Service Education: Teacher Growth Increases Pupil Growth. Arithmetic Teacher 10: 243-247; May 1963.

Howell, Edgar N. and Melander, Richard. College Students' Ability to Prove Mathematical Theorems With and Without Training in Inference Patterns. Journal of Experimental Education 35: 58-65; Summer 1967.

Howlett, John L. A Study of Placement Methods for Entering College Freshmen in the Proper Mathematics Sequence at Michigan Technological University. Mathematics Teacher 62: 651-659; December 1969.

Huettig, Alice and Newell, John M. Attitudes Toward Introduction of Modern Mathematics Program by Teachers with Large and Small Number of Years' Experience. Arithmetic Teacher 13: 125-130; February 1966.

Hunkler, Richard. A New Look at the Implementation of the CUPM Level I Recommendations. School Science and Mathematics 71: 423-425; May 1971.

Only nine per cent of the teachers had less than two years of college preparatory mathematics, but 90 per cent had less than six hours of college mathematics and 60 per cent had no hours. Only one teacher had met CUPM minimum recommendations of 12 hours. [s; 211 teachers; teachers in grade 6]

Hunkler, Richard. An Evaluation of a Short-Term In-Service Mathematics Program for Elementary School Teachers. School Science and Mathematics 71: 650-654; October 1971.

Completing in-service programs had a positive effect on the concept scores of pupils who had one year of instruction in modern textbooks, but a negative effect on those with two or three years of modern instruction. There was no effect on problem solving scores. [e; 148 teachers and classes; teachers in grade 6]

Hunkler, Richard and Quast, W. G. Improving the Mathematics Attitudes of Prospective Elementary School Teachers. School Science and Mathematics 72: 709-714; November 1972.

Attitudes toward mathematics were higher at the end of a method-content course than at the beginning, and were higher than for students who had no mathematics course. [f; 125 students; elementary pre-service]

Hutchinson, C. A. Report of the Committee on Tests. American Mathematical Monthly 47: 290-301; May 1940.

Hutchinson, C. A., ed. Mathematics Instruction for Purposes of General Education. American Mathematical Monthly 48: 189-197; March 1941.

Jessup, Walter A. Economy of Time in Arithmetic. Elementary School Teacher 14: 461-476; 1914.

Johnson, Buford. Development of Thought. Child Development 9: 1-7; March 1938.

Johnson, J. T. The Merits of Different Methods of Subtraction. Journal of Educational Research 10: 279-290; November 1924.

Johnson, J. T. The Efficiency of Decomposition Compered with That of Equal Additions as a Technique in Subtraction of Whole Numbers. Mathematics Teacher 24: 5-13; January 1931.

Johnson, Phillip E. Academic Qualifications of North Carolina's Community College Professors. Two-Year College Mathematics Journal 3: 33-36; Fall 1972.

Professional background factors of faculty were surveyed. [s; --; community college]

Jones, Phillip S. and Coxford, Arthur F., Jr. Academic and Professional Preperation of Secondary School Mathematics Teachers. Review of Educational Research 34: 322-333; June 1964.

Kane, Robert B. Attitudes of Prospective Elementary School Teachers Toward Mathematics and Three Other Subject Areas. Arithmetic Teacher 15: 169-175; February 1968.

Kaplan, Jerome D. An Example of Student-Generated Sequences in Mathematics Instruction. Mathematics Teacher 57: 298-302; May 1964.

Karplus, Elizabeth F. and Karplus, Robert. Intellectual Development Beyond Elementary School: I. Deductive Logic. School Science and Mathematics 70: 398-406; May 1970.

Responses to a logic puzzle were placed in six categories, with progress from "pre-logical" to "abstract logic" explanations evident as grade level increased; however, adults progressed little further. Only ten per cent of answers were correct at concrete levels; 60 per cent, at abstract levels. [s; 449 pupils; 5-12, adult]

Katz, Martin and Norris, Lila. The Contribution of Academic Interest Measures to the Differential Prediction of Marks. Journal of Educational Measurement 9: 1-11; Spring 1972.

Correlations of mathematics marks in grade 12 with predictors in grade 11 ranged from .22 to .49; in grade 13, correlations were from .09 to .37. [r; --; 11-13]

Keedy, M. L. Solid Geometry as an Entrance Requirement for Engineering Schools. Mathematics Teacher 52: 121-123; February 1959.

Kellems, R. L. Effectiveness of Programmed Teaching in College Algebra. Mathematics Teacher 58: 434-436; 1965.

Keller, M. W. and Jonah, H. F. S. Measures for Predicting Success in a First Course in College Mathematics. Mathematics Teacher 41: 350-355; December 1948.

Keller, M. W. and Shreve, D. R. Abilities of University Students in Freshman Mathematics. School Science and Mathematics 42: 38-46; January 1942.

Keller, M. W.; Shreve, D. R.; and Remmers, H. H. Diagnostic Testing Program in Purdue University: 1. Formal Algebraic Manipulations. American Mathematical Monthly 47: 544-548; October 1940.

Keller, M. W.; Shreve, D. R.; and Remmers, H. H. Diagnostic Testing Program in Purdue University: 2. Solution of Simple Equations. American Mathematical Monthly 48: 39-41; January 1941.

Keller, M. W.; Shreve, D. R.; and Remmers, H. H. A Mathematics Diagnostic Testing Program in Purdue University, II. Mathematics Teacher 35: 8-14; January 1942.

Keller, M. W.; Shreve, D. R.; and Remmers, H. H. Diagnostic Testing Program in Purdue University: 3. A Report of the Results of the Program. American Mathematical Monthly 50: 85-90; February 1943.

Kenney, Russell A. Mathematical Understandings of Elementary School Teachers. Arithmetic Teacher 12: 431-442; October 1965.

Kerr, R. D.; Alspaugh, John W.; and Reys, Robert E. A Study of Selected Charscteristics of Secondary Mathematics Teachers. School Science and Mathematics 69: 781-790; December 1969.

Kersh, Bert Y. The Adequacy of "Meaning" as an Explanation for the Superiority of Learning by Independent Discovery. Journal of Educational Psychology 49: 282-292; October 1958.

Kersh, Bert Y. Learning by Discovery: What Is Learned? Arithmetic Teacher 11: 226-232; April 1964.

Kersh, Bert Y. and Wittrock, Merl C. Learning by Discovery: An Interpretation of Recent Research. Journal of Teacher Education 13: 461-468; December 1962.

King, Bruce W. On Scrambling Instructional Stimuli. Journal for Research in Mathematics Education 1: 233-240; November 1970.

Research suggests that varying highly refined sequences of instructional stimuli does not make much difference in effectiveness of instruction, as long as concept order is preserved; 19 references are cited. [d; —; elementary - college]

King, Robert W. Using Programmed Instruction to Investigate the Effects of Group Interaction on Learning Mathematics. Mathematics Teacher 62: 393-398; May 1969.

Kinney, Lucien B.; Eagle, Edwin; and Purdy, Charles. The Teaching of Mathematics in High School and College. Review of Educational Research 21: 305-316; October 1951.

Kinser, J. R. and Kinser, Lydia G. Predicting Grades in Advanced College Mathematics. Journal of Applied Psychology 37: 182-184; June 1953.

Kipps, Carol. Elementary Teachers' Ability to Understand Concepts Used in New Mathematics Curricula. Arithmetic Teacher 15: 367-370; April 1968.

Kirkpatrick, E. A. An Experiment in Memorizing Versus Incidental Learning. Journal of Educational Psychology 5: 405-412; September 1914.

Kline, L. W. and Anderson, P. K. The Role of Habit in Reasoning. School Science and Mathematics 26: 156-167; February 1926.

Kneits, Margaret H. A Study of Secondary Mathematics Teachers: What Influences Them to Leave the Profession? American Mathematical Monthly 78: 1012-1016; November 1971.

Eighty-five per cent of the sample felt that their mathematics courses had prepared them adequately or better; 72 per cent felt that a methods course had been adequate. Almost half of the graduates were not teaching. [s; 316 teachers; pre- and in-service (grades 6-12)]

Kneits, Margaret H. and Creswell, John L. An Action Program in Mathematics for High School Dropouts. Mathematics Teacher 62: 213-217; March 1969.

Knight, Carlton W., II. Doctoral Dissertation Research in Science and Mathematics Reported for Volume 31 of Dissertation Abstracts: Part II - Mathematics. School Science and Mathematics 73: 121-146; February 1973.

One hundred dissertations were classified as elementary; 48, junior high; 55, secondary; 84, college and adult; and 58, teacher education (some duplicate listing). [d; --; elementary - college]

Kossack, C. F. Mathematics Placement at the University of Oregon. American Mathematical Monthly 49: 234-237; April 1942.

Krathwohl, William C. Relative Contributions of Aptitude and Work Habits to Achievement in College Mathematics. Journal of Educational Psychology 44: 140-148; March 1953.

Kruglak, Haym, High School Mathematics Background of College Freshmen Before and After Sputnik. Mathematics Teacher 63: 339-341; April 1970.

The proportion of freshmen with more than two years of high school mathematics increased significantly between 1958 and 1963, as well as an increase in those with at least one or two years of mathematics. [f; 3658 students; college freshmen]

Lambert, Philip. Mathematical Ability and Masculinity. Arithmetic Teacher 7: 19-21; January 1960.

Larney, Violet H. Female Mathematicians, Where Are You? American Mathematical Monthly 80: 310-313; March 1973.

Women earned seven per cent of the doctorates in mathematics from 1931-1970; for 1966-1970, they earned the same per cent at the doctoral, 25 per cent at the masters, and 36 per cent at the bachelors levels. [d; --; college]

Layton, W. I. The Certification of Teachers of Mathematics. Mathematics Teacher 42: 377-380; December 1949.

Layton, W. I. Mathematical Training Prescribed by Teachers Colleges in the Preparation of Elementary Teachers. Mathematics Teacher 44: 551-556; December 1951.

Lefkowits, Ruth S. The First Nine Years - A Study of the Advanced Placement Program in Mathematics. Journal for Research in Mathematics Education 2: 23-35; January 1971.

Of the students who took the advanced placement examination, 52 per cent were offered placement. There was little uniformity in the treatment of the 42 per cent who accepted it. [s; 182 students; college]

Leissa, Arthur W. and Fisher, Robert C. A Survey of Teachers' Opinions of a Revised Mathematics Curriculum. Mathematics Teacher 53: 113-118; February 1960.

Leonhardy, Adele. The Mathematics Used in the Biological and the Physical Science Areas in a College Program of General Education. School Science and Mathematics 51: 265-274; April 1951.

Lewis, Eunice and Plath, Ernest C. Plus Work for "Plus" Pupils. Arithmetic Teacher 6: 251-256; November 1959.

Lewis, William A. Early Prediction of College GPA Using Pre-College School Grades. Journal of Educational Measurement 3: 35-36; Spring 1966.

Lightner, J. E. and Gilman, Sister John Frances. A Televised Course for Elementary Teachers. American Mathematical Monthly 78: 537-542; May 1971.

The course appeared to be useful in increasing achievement. [s; --; elementary in-service]

Lilge, A. A. A Description of a Group-Learning Experience. Arithmetic Teacher 20: 51-55; January 1973.

A mathematics course in which students worked in groups under group leaders resulted in better-than-expected achievement. [s; 109 students; elementary pre-service]

Litwiller, Bonnie H. Enrichment: A Method of Changing the Attitudes of Prospective Elementary Teachers Toward Mathematics. School Science and Mathematics 70: 345-350; April 1970.

Attitudes of students who were given an enrichment problem each day became more positive, while students in regular classes showed no attitude change. [e; 145 students; elementary pre-service]

Long, Thomas E. and Harr, Edwin L. Teacher Perceptions of Basic Mathematics Skill Needs in Secondary Vocational Education. Mathematics Teacher 66: 61-66; January 1973.

Skills needed by vocational students, skills lacked by students, and skills needing remedial attention were listed as they were ranked by teachers. [s; 260 teachers; secondary in-service]

Lucas, John F. The Teaching of Heuristic Problem-Solving Strategies in Elementary Calculus. Journal for Research in Mathematics Education 5: 36-46; January 1974.

Heuristic-oriented instruction appeared to be an effective mode of teaching problem solving. [e; 30 students (2 classes); college]

Lueck, William R. How Much Arithmetic and Algebra Do Students of First Year College Physics Really Know? School Science and Mathematics 32: 998-1005; December 1932.

Lunneborg, Clifford E. A Research Review of the Washington Pre-College Testing Program. Journal of Educational Measurement 3: 157-166; Summer 1966.

Lunneborg, Clifford E. Biographic Variables in Differential Vs. Absolute Prediction. Journal of Educational Measurement 5: 207-210; Fall 1968.

Lunneborg, Clifford E. Use of Factor Scores in Differential Prediction of Academic Success. Journal of Educational Measurement 5: 297-300; Winter 1968.

Lunneborg, Clifford E. and Lunneborg, Patricia W. Deviations From Predicted Growth of Abilities for Male and Female College Students. Journal of Educational Measurement 6: 165-172; Fall 1969.

Lyng, Merwin J. Factors Relating to a Teacher's Knowledge of Contemporary Mathematics. Mathematics Teacher 61: 695-697; November 1968.

Maltbie, Armstrong; Savage, R. G.; and Wasik, J. L. The Operation and Evaluation of a Proctorial System of Instruction in Mathematics. American Mathematical Monthly 81: 71-78; January 1974.

Groups using the self-paced approach achieved significantly better on algebra and trigonometry tests than the traditionally taught group did. [e; 99 students (4 sections); 13]

Mangrum, Charles T., II and Knight, Carlton W., II. Doctoral Dissertation Research in Science and Mathematics Reported for Volume 28 of Dissertation Abstracts. School Science and Mathematics 70: 37-62; January 1970.

For July 1967 - June 1968, 55 dissertations pertaining to elementary school mathematics and 19 to teacher education are included. [d; --; elementary - college]

Mangrum, Charles T., II and Knight, Carlton W., II. Doctoral Dissertation Research in Science and Mathematics Reported for Volume 29 of Dissertation Abstracts. School Science and Mathematics 71: 203-225; March 1971.

Forty-four elementary school mathematics dissertations were listed, 32 on secondary school mathematics, 14 on teacher education, and 23 on college and adult mathematics education. [d; --; elementary - adult]

Mangrum, Charles T., II and Knight, Carlton W., II. Doctoral Dissertation Research in Science and Mathematics Reported for Volume 30 of Dissertation Abstracts. School Science and Mathematics 72: 505-534; June 1972.

Listed are 45 dissertations on elementary school mathamatics, 23 for junior high school, 18 for secondary school, 38 for college and adults, and 26 for teacher education. [d; --; elementary - adult]

Mangrum, Charles and Morris, William. Doctoral Dissertation Research in Science and Mathamatics Reported for 1965. School Science and Mathematics 68: 199-216; March 1968.

Mangrum, Charles and Morris, William. Doctoral Dissertation Research in Science and Mathematics. School Science and Mathematics 69: 431-449; May 1969.

Marshall, M. V. Some Factors Which Influence Success in College Algebra. Mathematics Teacher 32: 172-174; April 1939.

Martin, Bernard L. Spatial Visualization Abilities of Prospective Mathematics Teachers. Journal of Research in Science Teaching 5: 11-19; 1967-1968.

Martin, Roy and Meyers, Joel. Effects of Anxiety on Quantity of Examination Preparation. Psychology in the Schools 11: 217-221; April 1974.

Both state and trait anxiety were significantly correlated with amount of study prior to a mathematics examination. [--; 100 women; college]

Matthews, Charles G. and Folk, Earl D. Finger Localization, Intelligence, and Arithmetic in Mentally Retarded Subjects. American Journal of Mental Deficiency 69: 107-113; July 1964.

Maul, Ray C. Where Do Eligible Mathematics Teachers Go? Mathematics Teacher 48: 397-400; October 1955.

Mayer, Richard E. Acquisition Processes and Resilience Under Varying Testing Conditions for Structurally Different Problem-Solving Procedures. Journal of Educational Psychology 66: 644-656; October 1974.

Students taught with emphasis on calculating with a formula excelled on interpretive items while those taught the meanings of variables in the formula did better on near-transfer items. [e; 225 students; college]

McCallon, Earl L. and Brown, John D. A Semantic Differential Instrument for Measuring Attitude Toward Mathematics. Journal of Experimental Education 39: 69-72; Summer 1971.

Correlation of the developed instrument with the Aiken-Dreger scale was .90. [r; 68 students; college]

McKeachie, W. J. and Lin, Yi-Guang. Sex Differences in Student Response to College Teachers: Teacher Warmth and Teacher Sex. American Educational Research Journal 8: 221-226; March 1971.

With male teachers, high teacher warmth resulted in higher mathematics achievement than did low teacher warmth. [r; --; 13]

McKelpin, J. P. Some Implications of the Intellectual Characteristics of Freshmen Entering a Liberal Arts College. Journal of Educational Measurement 2: 161-166; December 1965.

McKillip, William D. The Effects of High School Calculus on Students' First-Semester Calculus Grades at the University of Virginia. Mathematics Teacher 59: 470-472; May 1966.

McNemar, O. W. An Attempt to Differentiate Between Individuals with High and Low Reasoning Ability. American Journal of Psychology 68: 20-36; March 1955.

Nelson, Ruth. How Well Are Colleges Preparing Teachers for Modern Mathematics? Arithmetic Teacher 12: 51-53; January 1965.

Merritt, Paul W. Some Research Support for a Second Chance in Beginning Algebra. Two-Year College Mathematics Journal 5: 50-54; Spring 1974.

The program was found to be affective for underachievers. [a; --; junior college]

Milholland, John E. and Womer, Frank B. The Relation of Ninth and Tenth Grade Differential Aptitude Test Scores to Choices of Academic Majors at the University of Michigan. Journal of Educational Measurement 2: 65-68; June 1965.

Miller, G. H. Difficulties in Algebra: A Study. School Science and Mathematics 58: 714-720; December 1958.

Miller, G. H. Theory or Practice in Arithmetic - Which Shall It Be? A Comparison Between a "Modern" Program and a "Modified Traditional" Program. School Science and Mathematics 70: 115-120; February 1970.

The "modified" group scored significantly higher than the group using a "modern" textbook. [e; 137 students; 13]

Miller, Wayne L. The Contract Method Vs. the Traditional Method of Teaching Developmental Mathematics to Underachievers: A Comparative Analysis. Two-Year College Mathematics Journal 5: 45-49; Spring 1974.

The contractive method was found to be effective. [a; 68 classes, 171 students; junior college]

Milliken, Robert L. Mathematical-Verbal Ability Differentials of Situational Anxiety as Measured by Blood Pressure Change. Journal of Experimental Education 32: 309-311; Spring 1964.

Milton, G. A. The Effects of Sex-Role Identification Upon Problem-Solving Skill. Journal of Abnormal and Social Psychology 55: 208-212; September 1957.

Mires, Kathrine C. General Mathematics for College Freshmen. Mathematics Teacher 50: 513-516; November 1957.

Moody, William B. and Wheatley, Grayson H. Evaluating Mathematics Courses for Prospective Elementary School Teachers. School Science and Mathematics 69: 703-707; November 1969.

Morgan, William P. Prediction of Success in Junior College Mathematics. Mathematics Teacher 63: 260-263; March 1970.

The equation using test score, years of and mean grade in high school mathematics, and age, was found to be 90 per cent accurate in its predictions. [r; 60 students; junior college]

Morman, Shelba Jean. An Audio-Tutorial Method of Instruction Vs. the Traditional Lecture-Discussion Method. Two-Year College Mathematics Journal 4: 56-61; Fall 1973.

No significant difference in achievement was found between students using an audio-tutorial or lecture-discussion method. [e; 4 classes; junior college]

Morton, R. L. Mathematics in the Training of Arithmetic Teachers. Mathematics Teacher 32: 106-110; March 1939.

Morton, R. L. and Miller, Leslie Haynes. A Comparative Study of the Scholarship Records of Students Who Major in Mathematics. School Science and Mathematics 36: 965-967; December 1936.

Munday, Leo. Predicting College Grades in Predominantly Negro Colleges. Journal of Educational Measurement 2: 157-160; December 1965.

Myers, Garry C. and Myers, Caroline C. The Cost of Quick Shifting in Number Learning. Educational Research Bulletin 7: 327-334; October 31, 1928.

Nagel, Thomas S. Effects of Programmed Instruction in Remedial College Algebra Classes. Mathematics Teacher 60: 748-752; November 1967.

Neatrour, Charles R. and Mullenex, James L. To Be or Not To Be - Calculus in the High School? School Science and Mathematics 73: 72-76; January 1973.

Of students who had taken a calculus course in high school, 56 per cent were placed in pre-calculus or beginning calculus courses in college; advanced placement was granted to 35 per cent. [s; 293 students; college]

Neimark, Edith D. and Slotnick, Nan S. Development of the Understanding of Logical Connectives. Journal of Educational Psychology 61: 451-460; December 1970.

Inclusion and exclusion were understood by a majority of even the youngest children. Intersection was understood by a majority of all but the youngest children, while union was not understood by the majority except at the college level. [s; 513 students; 3-9, 13]

Nelson, L. Doyal and Worth, Walter H. Mathematical Competence of Prospective Elementary Teachers in Canada and in the United States. Arithmetic Teacher 8: 147-151; April 1961.

Newland, T. Ernest. A Study of the Specific Illegibilities Found in the Writing of Arabic Numerals. Journal of Educational Research 21: 177-185; March 1930.

Newman, Fredrick L.; Young, Dennis L.; Ball, Stanley E.; Smith, Clarence C.; and Purtle, Ronald B. Initial Attitude Differences Among Successful, Procrastinating, and "Withdrawn-From-Course" Students in a Personalized System of Statistics Instruction. Journal for Research in Mathematics Education 5: 105-113; March 1974.

Students withdrawing or procrastinating were found to have initial feelings of anonymity in mathematics courses and less interest in doing mathematics problems. [--; 250 students; college]

Nickle, George H. The Mathematics Most Used in the Sciences of Physics, Chemistry, Engineering, and Higher Mathematics. Mathematics Teacher 35: 77-83; February 1942.

Norris, Fletcher R. Student Mathematics Achievement as Related to Teacher In-Service Work. Mathematics Teacher 62: 321-327; April 1969.

North, J. A.; Grent, D. A.; and Fleming, R. A. Choice Reaction Time to Single Digits, Spelled Numbers, "Right" and "Wrong" Arithmetic Problems and Short Sentences. Quarterly Journal of Experimental Psychology 19: 73-77; 1967.

Northup, G. J.; Pingry, R. E.; and Wineor, A. L. A Functional Item Analysis of Group Performance in General Mathematics. Journal of Experimental Education 18: 279-285; March 1950.

Nott, Maurice E., Jr. New Results of Research Comparing Programmed and Lecture-Text Instruction. Two-Year College Mathematics Journal 2: 19-22; Spring 1971.

Programmed instruction appeared effective for instruction in algebra. [e; --; junior college]

O'Quinn, Ralph. Status and Trends of Ability Grouping in the State Universities. Mathematics Teacher 33: 213-215; May 1940.

Orleans, Jacob S. and Sperling, Julia L. The Arithmetic Knowledge of Graduate Students. Journal of Educational Research 48: 177-186; November 1954.

Orleans, Jacob S. and Wandt, Edwin. The Understanding of Arithmetic Possessed by Teachers. Elementary School Journal 53: 501-507; May 1953.

Ottley, Esther. The Effect of Remedial Instruction on Mathematical Achievement. American Mathematical Monthly 75: 1002-1004; November 1968.

Ovarn, O. E. A. Changes in Correlations in Elementary Algebra Since 1900 as Reflected in Requirements and Examinations of the College Entrance Examination Board. Journal of Experimental Education 5: 373-468; June 1937.

Parkman, John M. and Groen, Guy J. Temporal Aspects of Simple Addition and Comparison. Journal of Experimental Psychology 89: 335-342; August 1971.

Latencies for addition increased linearly as a function of the minimum addend and also of the sum. For comparison, negative responses had longer latencies than did positive responses. [e; 6 students; college]

Perlberg, Arye. Predicting Academic Achievements of Engineering and Science College Students. Journal of Educational Measurement 4: 241-246; Winter 1967.

Perry, Dallis K. Speed and Accuracy of Reading Arabic and Roman Numerals. Journal of Applied Psychology 36: 346-347; October 1952.

Perry, Donald. A Study, Using CUPM Recommendations as Criteria, of the Academic Preparation of Two-Year College Teachers. Two-Year College Mathematics Journal 4: 67-71; Spring 1973.

The average two-year college teacher was not adequately prepared by CUPM recommendations, but he believes these are more than is needed. [s; 311 faculty (in 57 colleges); college]

Perry, Winona M. Influence of Student Dreads Upon Attitudes Toward School Subjects. Journal of Experimental Education 12: 48-63; September 1943.

Peterson, Margaret Jean and Aller, Sonia. Arithmetic Problem Solving. Journal of Experimental Psychology 91: 93-97; November 1971.

Simple addition and multiplication examples were solved more quickly than negative addition or subtraction examples. Number of operations and size of numbers were also related to solution time. [—; —; college]

Pethtel, Richard D. Closed-Circuit Television Instruction in College Mathematics. Mathematics Teacher 61: 517-521; May 1968.

Phillips, Clarence. Background and Mathematical Achievement of Elementary Education Students in Arithmetic for Teachers. School Science and Mathematics 53: 48-52; January 1953.

Phillips, Clarence. The Relationship Between Arithmetic Achievement and Vocabulary Knowledge of Elementary Mathematics. Arithmetic Teacher 7: 240-242; May 1960.

Phillips, Clarence. Approach to the Training of Prospective Elementary Mathematics Teachers. Journal of Teacher Education 19: 293-297; Fall 1968

Pick, Herbert L., Jr. and Pick, Anne D. A Developmental and Analytic Study of the Size-Weight Illusion. Journal of Experimental Child Psychology 5: 362-371; September 1967.

Plumlee, Lynnette B. Comparison of Problem Types in the Comprehensive Mathematics Test. College Board Review 1: 17, 29-31; Fall 1947.

Plumlee, Lynnette B. The Verbal Component in Mathematics Items. Educational and Psychological Measurement 9: 679-684; Winter 1949.

Poffenberger, Thomas and Norton, Donald A. Factors Determining Attitudes Toward Arithmetic and Mathematics. Arithmetic Teacher 3: 113-116; April 1956.

Poffenberger, Thomas and Norton, Donald A. Factors in the Formation of Attitudes Towards Mathematics. Journal of Educational Research 52: 171-176; January 1959.

Poffenberger, Thomas and Norton, Donald. Sex Differences in Achievement Motive in Mathematics as Related to Cultural Change. Journal of Genetic Psychology 103: 341-350; 1963.

Pollio, Howard R. and Reinhart, Daniel. Rules and Counting Behavior. Cognitive Psychology 1: 388-402; October 1970.

Students acquired inductively the ability to count in non-decimal numeration systems, and subsequently were able to do novel tasks requiring manipulation of the system. [e; 24 students; college]

Popejoy, William Dean. An Experimental Study of Two Curricular Organizations of First-Year Mathematics at Colorado State College. Colorado Journal of Educational Research 2: 32-33; May 1963.

Porterfield, O. V. Ambiguities in Teaching Arithmetic. Arithmetic Teacher 12: 348-351; May 1965.

Pressey, Luella Cole. The Needs of Freshmen in the Field of Mathematics. School Science and Mathematics 30: 238-243; March 1930.

Preston, Ralph C. and Botel, Morton. The Relation of Reading Skill and Other Factors to the Academic Achievement of 2,048 College Students. Journal of Experimental Education 20: 363-371; June 1952.

Price, James E. Automated Teaching Programs with Mentally Retarded Students. American Journal of Mental Deficiency 68: 69-72; July 1963.

Prouse, Howard and Turner, V. Dean. Factors Contributing to Success in Calculus II. Journal of Educational Research 62: 439-440; July-August 1969.

Pruitt, Clarence M. Certification Requirements for Teachers in Elementary and Secondary Schools. Science Education 36: 182-193; April 1952.

Prusek, Robert M. Prediction of Success in Elementary Statistics. Journal of Educational Measurement 1: 165-167; December 1964.

Punke, Harold H. Age of Parent and Intelligence of Offspring. Elementary School Journal 39: 617-622; April 1939.

Pyle, W. H. The Relation of Ability to Achievement. School and Society 22: 406-408; September 1925.

Ralya, Lynn L. A Study of Achievement by Entering College Freshmen with Reference to Specific Elements of Knowledge in Geometry. School Science and Mathematics 42: 14-16; January 1942.

Rappaport, David. Preparation of Teachers of Arithmetic. School Science and Mathematics 58: 636-643; November 1958.

Rappaport, David. The Meanings Approach in Teaching Arithmetic. Chicago School Journal 44: 172-174; January 1963.

Rasmussen, Otho M. Mathematics Used in Courses of Various Departments in a University. Mathematics Teacher 48: 237-242; April 1955.

Rausch, Oscar P. The Retention by Teachers of Computational Skills in Arithmetic. Mathematics Teacher 40: 178-179; April 1947.

Read, Cecil B. Relative Efficiency of Two Methods of Approximating the Roots of an Algebraic Equation. School Science and Mathematics 35: 30-34; January 1935.

Read, C. B. and Klein, A. E. An Analysis of Mathematics Courses on Four Year Colleges. School Science and Mathematics 55: 40-55; January 1955.

Rebert, G. Nevin. A Laboratory Study of the Reading of Familiar Numerals. Journal of Educational Psychology 23: 35-45; January 1932.

Rebert, G. Nevin. A Laboratory Study of the Reading of Familiar Formulas. Journal of Educational Psychology 23: 192-203; March 1932.

Rector, Robert E. and Henderson, Kenneth B. The Relative Effectiveness of Four Strategies for Teaching Mathematical Concepts. Journal for Research in Mathematics Education 1: 69-75; March 1970.

No significant differences were found between the four instructional strategies, involving varied sequences of characterization and exemplification moves. [4; 182 students; 13]

Reed, H. B. Distributed Practice in Addition. Journal of Educational Psychology 15: 248-249; April 1924.

Reitle, Frank. Speed of Adding and Comparing Numbers. Journal of Experimental Psychology 83: 274-278; February 1970.

Errors and latency increased with size of numbers. Speed and accuracy increased with the difference between A and B, but were also high when A = B. [e; 38 students; college]

Reys, Robert E. Are Elementary School Teachers Satisfied with Their Mathematics Preparation? Arithmetic Teacher 14: 190-193; March 1967.

Reys, Robert E. Mathematical Competencies of Elementary Education Majors. Journal of Educational Research 61: 265-266; February 1968.

Reys, Robert E. Mathematical Competencies of Preservice Elementary School Teachers. School Science and Mathematics 68: 302-308; April 1968.

Reys, Robert E. and Delon, Floyd G. Attitudes of Prospective Elementary School Teachers Towards Arithmetic. Arithmetic Teacher 15: 363-366; April 1968.

Reys, R. E.; Kerr, R. D.; and Alspaugh, J. W. Mathematics Training of Secondary Mathematics Teachers. American Mathematical Monthly 76: 933-937; October 1969.

Richards, James M., Jr. and Lutz, Sandra W. Predicting Student Accomplishment in College From the ACT Assessment. Journal of Educational Measurement 5: 17-29; Spring 1968.

Richtmeyer, Cleon C. A Course in Applied Mathematics for Teachers of Secondary Mathematics. Mathematics Teacher 31: 51-62; February 1938.

Richtmeyer, Cleon C. Functional Mathematical Needs of Teachers. Journal of Experimental Education 6: 396-398; June 1938.

Riedesel, C. Alan and Suydam, Marilyn N. Computer-Assisted Instruction: Implications for Teacher Education. Arithmetic Teacher 14: 24-29; January 1967.

Rimland, B. Effect of Including Extraneous Numerical Information in a Test of Arithmetic Reasoning. Educational and Psychological Measurement 20: 787-794; Winter 1960.

Rimland, Bernard and Zweraki, Edwin. The Use of Open-End Data as an Aid in Writing Multiple-Choice Distractors. Journal of Applied Psychology 46: 31-33; 1962.

Roberge, James J. Further Examination of Mediated Associations in Deductive Reasoning. Journal of Experimental Psychology 87: 127-129; January 1971.

Significant differences were found in both number of errors and certainty of judgment for varied syllogistic figures. [e; 52 students; graduate students]

Roberts, Fannie. Attitudes of College Freshmen Towards Mathematics. Mathematics Teacher 62: 25-27; January 1969.

Robertson, Fred. Some Phases of the Mathematics Testing Program at the Iowa State College. Mathematics Teacher 36: 296-302; November 1943.

Robinson, Arthur E. Are We Teaching Arithmetic Effectively? A Summary of a Recent Study. Mathematics Teacher 28: 215-222; April 1935.

Robinson, William Baker. The Effects of Two Semesters of Secondary School Calculus on Students' First and Second Quarter Calculus Grades at the University of Utah. Journal for Research in Mathematics Education 1: 57-60; January 1970.

Students who had two semesters of calculus in high school achieved higher grades in college calculus than were predicted (using data from students who had completed only one semester of analytic geometry by the end of high school), even though they were repeating the courses. [f; 5 groups (226 students); college]

Robold, Alice I. College Instructors of Mathematics for Elementary-School Teachers. American Mathematical Monthly 73: 191-192; February 1966.

Rogers, Charles F. Arithmetic and Emotional Difficulties in Some University Students. Mathematics Teacher 30: 3-9; January 1937.

Roughead, William G. and Scandura, Joseph M. "What Is Learned" in Mathematical Discovery. Journal of Educational Psychology 59: 283-289; August 1968.

Ruddell, Arden K. and Brown, Gerald W. In-Service Education in Arithmetic: Three Approaches. Elementary School Journal 64: 377-382; April 1964.

Rule, Stanley J. and Curtis, Dwight W. Conjoint Scaling of Subjective Number and Weight. Journal of Experimental Psychology 97: 305-309; March 1973.

Students compared the subjective magnitude of weights with the integers 1-9; power functions were found. [a; 36 students; college]

Rule, Stanley J.; Curtis, Dwight W.; and Markley, Robert P. Input and Output Transformations From Magnitude Estimation. Journal of Experimental Psychology 86: 343-349; December 1970.

Judged magnitudes of difference in area of paired circles and magnitude estimations of the circles making up the pairs were obtained; power functions were found. [a; 12 students; college]

Russell, Garland B. Decimal Usage in the Occupational World. Journal of Educational Research 38: 633-638; April 1945.

Ryan, James J. Previous Instructional Program as a Moderator of the Predictive Validity of College Entrance Tests in Mathematics. Educational and Psychological Measurement 28: 937-941; Autumn 1968.

Sala, Vincent. Industry's Use of Measures. Education 71: 487-490; April 1951.

Sarner, David S. and Frymier, Jack R. Certification Requirements in Mathematics and Science. School Science and Mathematics 59: 456-460; June 1959.

Sarner, David S. and Frymier, Jack R. Certification Requirements in Mathematics and Science - A Follow-Up of Recent Changes. School Science and Mathematics 59: 745-746; December 1959.

Sassenrath, Julius M. and Pugh, Richard. Relationships Among CEEB Scholastic Aptitude Test and American College Test Scores and Grade Point Average. Journal of Educational Measurement 2: 199-205; December 1965. (See also: Journal of Educational Measurement 3: 37-38; Spring 1966.)

Saunders, David R. A Factor Analysis of the Information and Arithmetic Items of the WAIS. Psychological Reports 6: 367-383; June 1960.

Scandura, Joseph M. Prior Learning, Presentation Order, and Prerequisite Practice in Problem Solving. Journal of Experimental Education 34: 12-20; Summer 1966.

Scandura, Joseph M. Learning Verbal and Symbolic Statements of Mathematical Rules. Journal of Educational Psychology 58: 356-364; December 1967.

Scandura, Joseph M. The Formulation of Research on Subject Matter Learning. Psychology in the Schools 5: 330-341; October 1968.

Scandura, Joseph M. and Behr, Merlyn. Prerequisite Practice and Criterion Form in Mathematics Learning. Journal of Experimental Education 35: 54-55; Fall 1966.

Scandura, Joseph M. and Wells, Jay Norman. Advance Organizers in Learning Abstract Mathematics. American Educational Research Journal 4: 295-301; May 1967.

Scandura, Joseph M.; Woodward, Ernest; and Lee, Frank. Rule Generality and Consistency in Mathematics Learning. American Educational Research Journal 4: 303-319; May 1967.

Schaaf, William L. Arithmetic for Arithmetic Teachers. School Science and Mathematics 53: 537-543; October 1953.

Schlessinger, Fred R. and Helgeson, Stanley L. National Programs in Science and Mathematics Education. School Science and Mathematics 69: 633-643; October 1969.

Schoen, Harold L. A Plan to Combine Individualized Instruction with the Lecture Method. Mathematics Teacher 67: 647-651; November 1974.

No significant differences in achievement were found between groups having an individualized module approach or group problem sessions. [a; 70 students; college]

Schoen, Harold L. and Kreye, Bettibel C. Five Forms of Written Feedback to Homework in a Mathematics Course for Elementary Teachers. Journal for Research in Mathematics Education 5: 140-145; May 1974.

Groups receiving feedback directed specifically to a student's incorrect response scored significantly higher on the retention test than groups receiving a general explanation of the correct answer. [e; 147 teachers; elementary pre-service]

Schorling, Raleigh. The Crisis in Science and Mathematics Teaching. School Science and Mathematics 47: 413-420; May 1947.

Schrank, Wilburn R. Academic Stimulation of Mathematics Pupils From Their Classroom Association with Brighter Pupils. Mathematics Teacher 62: 473-475; October 1969.

Schumert, J. The Association of Mathematical Achievement with Certain Factors Resident in the Teacher, in the Teaching, in the Pupil, and in the School. Journal of Experimental Education 19: 219-238; 1951.

Schvaneveldt, Roger W. and Staudenmayer, Herman. Mental Arithmetic and the Uncertainty Effect in Choice Reaction Time. Journal of Experimental Psychology 85: 111-117; July 1970.

Similar reaction times were found for naming, adding one, and subtracting one conditions for mapping tasks; other conditions did show consistent increases in reaction times. [s; 90 students; college]

Scott, Winston M. and Gill, John P. A Prediction of Pupil Success in College Algebra. Mathematics Teacher 34: 357-359; December 1941.

Severinsen, K. Norman. A.C.T., W.A.I.S. Test Scores and College Grades. Journal of Educational Measurement 5: 161-162; Summer 1968.

Shepard, Roger N. and Feng, Christine. A Chronometric Study of Mental Paper Folding. Cognitive Psychology 3: 228-243; April 1972.

The time required to decide whether arrows on a pattern would meet, if the pattern were folded into a cube, increased as the number of folds increased. [s; 10 students; college]

Sherrill, James M. In-Service Mathematics Education as Viewed by Elementary School Teachers. School Science and Mathematics 71: 615-618; October 1971.

Teachers preferred (1) in-service programs to summer school, (2) equal presentation of methods and content, and (3) involvement of both university and school personnel. [s; 350 teachers; elementary in-service]

Sherrill, James M. Pre-Service Mathematics Education: What Is Required and What Elementary School Teachers Feel Should Be Required. School Science and Mathematics 73: 224-228; March 1973.

Teachers felt that pre-service programs should include two content and two methods courses. The amount of time a teacher spent in teaching mathematics seemed to reflect how she felt about her mathematics courses. [s; 313 teachers; elementary in-service]

Shim, Chung-Phing. A Study of the Cumulative Effect of Four Teacher Characteristics on the Achievement of Elementary School Pupils. Journal of Educational Research 59: 33-34; September 1965.

Shimizu, Mildred T. Achievement in Senior Advanced Mathematics and First-Year College Mathematics. Mathematics Teacher 62: 311-315; April 1969.

Shryock, Jerry. A Mathematics Course for Prospective Elementary School Teachers. Arithmetic Teacher 10: 208-211; April 1963.

Siegel, Alexander W. and McBurney, Donald H. Estimation of Line Length and Number: A Developmental Study. Journal of Experimental Child Psychology 10: 170-180; October 1970.

Children were able to match handgrip force to their perceptions of length of lines and verbally-presented numbers as reliably as adults. The technique may be used to assess perceptual and cognitive skills. [s; 96 pupils, 16 adults; ages 6-13, adult]

Silver, Jerry and Waits, Bert. Multiple-Choice Examinations in Mathematics, Not Valid for Everyone. American Mathematical Monthly 80: 937-942; October 1973.

For few students was there wide variability between grades on multiple-choice and objective tests. [r; 417 students; college]

Simpson, Ray H. Mathematics Teachers and Self-Evaluation Procedures. Mathematics Teacher 56: 238-244; April 1963.

Skypek, Dora Helen. A Comparison of the Mathematical Competencies of Education and Non-Education Majors Enrolled in a Liberal Arts College. American Mathematical Monthly 72: 770-773; September 1965.

Smith, Elsie Wardley. Mental Confusion in Arithmetic. Forum of Education 7: 211-226; November 1929.

Smith, Frank. How Well Are Colleges Preparing Teachers for Modern Mathematics? - An Answer. Arithmetic Teacher 14: 200-202; March 1967.

Smith, J. H. Arithmetical Combinations. Elementary School Journal 21: 762-770; June 1921.

Smith, Lehi T. Curricula for Education of Teachers. American Mathematical Monthly 70: 202-203; February 1963.

Snader, Daniel. Mathematical Background for Teachers of Arithmetic. Mathematics Teacher 39: 59-65; March 1956.

Sommer, Robert. Sex Differences in the Retention of Quantitative Information. Journal of Educational Psychology 49: 187-192; August 1958.

Sowder, Larry. The Influence of Verbalization of Discovered Numerical- or Sorting-Task Generalizations on Short-Term Retention in Connection with the Hendrix Hypothesis. Journal for Research in Mathematics Education 5: 167-176; May 1974.

No significant differences in retention were found among five verbalizing methods (speaking, reading, writing, listening, or no verbalizing), between oral and written modes, or between sources of verbalizing. [r; 50 students; secondary pre-service]

Spaney, Emma. The Performance of the Mathematics Candidates in the 1940 National Teacher Examinations. Mathematics Teacher 34: 8-11; January 1941.

Sparks, Jack N. Arithmetic Understandings Needed by Elementary-School Teachers. Arithmetic Teacher 8: 395-403; December 1961.

Stanley, Julian C. and Porter, Andrew C. Correlation of Scholastic Aptitude Test Score with College Grades for Negroes Versus Whites. Journal of Educational Measurement 4: 199-218; Winter 1967.

Steffani, R. R. Grouping by Academic Major in College Calculus. American Mathematical Monthly 78: 1135-1137; December 1971.

No significant differences in achievement were found between subgroups when they were taught half the time in subgroups, while differences were found between subgroups when they were taught only in a large group. [e; 88 students; --]

Stephens, J. M. and Lichtenstein, A. Factors Associated with Success in Teaching Grade Five Arithmetic. Journal of Educational Research 40: 683-694; May 1947.

Stipanowich, Joseph. The Mathematical Training of Prospective Elementary-School Teachers. Arithmetic Teacher 4: 240-248; December 1957.

Stockton, Doris S. An Experiment with a Large Calculus Class. American Mathematical Monthly 67: 1024-1025; December 1960.

Stone, Charles A. A Combined Course in Plane and Solid Geometry? Mathematics Teacher 24: 160-165; March 1931.

Strong, David H. The Effect of Class Size Upon Drop-Out Rate. MATYC Journal 8: 7-8; Spring 1974.

Near-zero correlations were found between class size and drop-out rate for mathematics classes in two suburban community colleges. [--; --; --]

Sueltz, Ben A. Mathematical Understanding and Judgments Retained by College Freshmen. Mathematics Teacher 44: 13-19; January 1951.

Summers, David A. and Hammond, Kenneth R. Inference Behavior in Multiple Multiple-Cue Tasks Involving Both Linear and Nonlinear Relations. Journal of Experimental Psychology 71: 751-757; May 1966.

Suppes, Patrick. The Ability of Elementary School Children to Learn the New Mathematics. Theory Into Practice 3: 57-61; April 1964.

Suppes, Patrick and Binford, Frederick. Experimental Teaching of Mathematical Logic in the Elementary School. Arithmetic Teacher 12: 187-195; March 1965.

Sutton, Traver C. Science - Mathematics - Industry. School Science and Mathematics 45: 560-568; June 1945.

Tatham, Clifford B. and Tatham, Elaine J. A Note on the Predictive Validity of the Cooperative Algebra III. Educational and Psychological Measurement 31: 517-518; Summer 1971.

The test was found to be reliable as a placement test. [r; 113 students; 13]

Taylor, E. H. The Preparation of Teachers of Arithmetic in Teachers Colleges. Mathematics Teacher 30: 10-14; January 1937.

Taylor, E. H. Mathematics for a Four-Year Course for Teachers in the Elementary School. School Science and Mathematics 38: 499-503; May 1938.

Taylor, S. Helen. An Experiment in Classification of Students in Mathematics. Mathematics Teacher 24: 414-423; November 1931.

Taylor, S. Helen. Classifying College Students on the Basis of Their Grades in Mathematics. Mathematics Teacher 27: 76-78; February 1934.

Terry, Paul W. The Reading Problem in Arithmetic. Journal of Educational Psychology 12: 365-377; October 1921.

Terry, Paul Washington. How Numerals Are Read: An Experimental Study of the Reading of Isolated Numerals and Numerals in Arithmetic Problems. Supplementary Educational Monographs 18: 1-110; 1922.

Thacker, G. R. and Read, C. B. Courses Desirable for Training Teachers of High School Mathematics. School Science and Mathematics 49: 611-618; November 1949.

Thompson, P. E. and Poe, R. L. A Report on the CUPM Recommendations in the State of Texas. American Mathematical Monthly 75: 1107-1111; December 1968.

Thorndike, Edward L. The Effect of Practice in the Case of a Purely Intellectual Function. American Journal of Psychology 19: 374-384; July 1908.

Thorndike, Edward L. Practice in the Case of Addition. American Journal of Psychology 21: 483-486; July 1910.

Tinker, Miles A. How Formulae Are Read. American Journal of Psychology 40: 476-483; July 1928.

Tinker, Miles A. Readability of Mathematical Tables. Journal of Applied Psychology 38: 436-442; December 1954.

Tinker, Miles A. Legibility of Mathematical Tables. Journal of Applied Psychology 44: 83-87; April 1960.

Todd, Robert M. A Mathematics Course for Elementary Teachers: Does It Improve Understanding and Attitude? Arithmetic Teacher 13: 198-202; March 1966.

Towler, John O. and Wheatley, Grayson. Conservation Concepts in College Students: A Replication and Critique. Journal of Genetic Psychology 118: 265-270; June 1971.

All students gave correct responses to questions on conservation of mass; three answered incorrectly on conservation of weight questions; 27 (39 per cent) answered incorrectly on conservation of volume questions. [n; 71 students; college]

Triplett, Richard J. Do You Know the Multiplication Table? Journal of Applied Psychology 21: 233-240; April 1937.

Turner, V. D.; Aldera, C. D.; Hatfield, F.; Croy, Harvey; and Sigriat, Charles. A Study of Ways of Handling Large Classes in Freshman Mathematics. American Mathematical Monthly 73: 768-770; September 1966.

Upshall, C. C. and Masters, Harry V. An Analysis of the Scores of Eighth-Grade Pupils and Normal School Students on Certain Objective Tests. Journal of Experimental Education 2: 310-316; March 1934.

Van Druff, John C. Prediction of Success of Community College Students in Calculus in the State of Washington. MATYC Journal 8: 8-10; Spring 1974.

Prediction factors were ascertained. [r; --; community college]

Very, P. S. Differential Factor Structures in Mathematical Ability. Genetic Psychology Monographs 75: 169-207; May 1967.

Waggoner, Wilbur. Improving the Mathematical Competency of Teachers in Training. Arithmetic Teacher 5: 84-86; March 1958.

Waggoner, Wilbur. High-School Mathematics Units and Success in a College of Education. School Science and Mathematics 58: 650-654; November 1958.

Wagner, John and Jones, Howard. Group-Based Instruction: The Best Chance for Success? Two-Year College Mathematics Journal 4: 51-54; Winter 1973.

Use offlexible time scheduling and mastery learning strategies appeared effective. [e; --; junior college]

Waits, Bert K. and Elbrink, Larry C. Student Evaluation of Mathematics Instruction. Two-Year College Mathematics Journal 4: 59-66; Spring 1973.

The correlation between student achievement and their evaluations of a calculus course was not significant. [r; 16 sections; college]

Wampler, Joe F. Prediction of Achievement in College Mathematics. Mathematics Teacher 59: 364-369; April 1966.

Wandt, Edwin and Brown, Gerlad W. Non-Occupational Uses of Mathematics: Mental and Written - Approximate and Exact. Arithmetic Teacher 4: 151-154; October 1957.

Wardrop, R. F. The Effect of Geometric Enrichment Exercises on the Attitudes Toward Mathematics of Prospective Elementary Teachers. School Science and Mathematics 72: 794-800; December 1972.

Geometric enrichment exercises did not significantly affect attitude toward mathematics or achievement. [e; 6 classes (111 students); elementary pre-service]

Washburn, Margaret F. Mathematical Ability, Reasoning and Academic Standing. American Journal of Psychology 50: 484-488; 1937.

Washburne, Carleton W. Social Practices in Arithmetic Fundamentals. Elementary School Journal 27: 60-66; September 1926.

Waters, Thomas J. and Daugherty, Robert A. Student Leadership, Mathematics Aptitude and College Major. Psychological Reports 27: 406; October 1970.

Student leaders scored lower in mathematics aptitude than did non-leaders. [f; 33 men; college]

Weaver, J. Fred. A Crucial Problem in the Preparation of Elementary School Teachers. Elementary School Journal 56: 255-261; February 1956.

Weaver, J. Fred. Levels of Geometric Understanding: An Exploratory Investigation of Limited Scope. Arithmetic Teacher 13: 322-332; April 1966.

Weaver, J. F. Nonmetric Geometry and the Mathematical Preparation of Elementary-School Teachers. American Mathematical Monthly 73: 1115-1121; December 1966.

Webb, Leland F. and Sharrill, James M. The Effects of Differing Presentations of Mathematical Word Problems Upon the Achievement of Pre-service Elementary Teachers. School Science and Mathematics 74: 559-565; November 1974.

The group receiving accurately drawn pictures performed better than groups having inaccurate or no pictures; having no pictures was better than having inaccurate pictures. [e; 80 students; elementary pre-service]

Wells, Frederic Lyman. The Relation of Practice to Individual Differences. American Journal of Psychology 23: 75-88; January 1912.

Whimbey, Arthur; Fiachhof, Valerie; and Silikowits, Ron. Memory Span: A Forgotten Capacity. Journal of Educational Psychology 60: 56-58; Spring 1969.

Whitman, Nancy C. In-Service Education and the Learning of Conceptual Mathematics. Arithmetic Teacher 13: 149-151; February 1966.

Wick, Marshall E. A Study of the Factors Associated with Success in First-Year College Mathematics. Mathematics Teacher 58: 642-648; November 1965.

Wiersma, William. A Cross-National Comparison of Academic Achievement of Mathematics Majors Prepering to Teach in the Secondary Schools. School Science and Mathematics 67: 389-394; May 1967.

Wiersma, William. A Cross-National Comparison of Academic and Affective Characteristics of Prospective Secondary School Teachers. Journal of Educational Measurement 9: 57-66; Spring 1972.

Few differences were found between prospective teachers in England and the U.S. The English men were high in mathematics performance. [r; 839 students; secondary pre-service]

Williams, Horace E. A Study of the Effectiveness of Classroom Teaching Techniques Following a Closed-Circuit Television Presentation in Mathematics. Mathematics Teacher 56: 94-97; February 1963.

Wilson, Dorothy W. Teaching Denominate Numbers and Measures. Educational Method 16: 177-181; January 1937.

Wilson, G. M. Arithmetic and the Taxpayer. NEA Journal 20: 221-222; June 1931.

Wise, Carl T. A Survey of Arithmetical Problems Arising in Various Occupations. Elementary School Journal 20: 118-136; October 1919.

Wolf, Robin Hill and Weiner, Frederick F. Effects of Four Noise Conditions on Arithmetic Performance. Perceptual and Motor Skills 35: 928-930; December 1972.

Students answered correctly a significantly higher proportion of arithmetic examples under a music condition than under the industrial noise condition, with no difference between quiet and speech conditions. [e; 15 students; college]

Wolfe, Jack. Mathematical Skill of College Freshmen in Topics Prerequisite to Trigonometry. Mathematics Teacher 34: 164-170; April 1941.

Wolfe, Jack. An Experimental Study in Remedial Teaching in College Freshman Mathematics. Journal of Experimental Education 10: 33-37; September 1941.

Wolfe, J. M. Proximity of Prerequisite Learning and Success in Trigonometry in College. Mathematics Teacher 49: 605-606; December 1956.

Wong, Ruth E. M. Geometry Preparation for High School Mathematics Teachers. American Mathematical Monthly 77: 70-78; January 1970.

Prospective teachers were required to take at least one course in geometry in most institutions. Emphasizing transformations in college level geometry was generally favored. More coordinate geometry, a vector approach, and a transformations approach at the high school were favored by at least 40 per cent. [s; 155 institutions; secondary pre-service]

Woodard, Mary Ann. Arithmetic and the Defense Worker. Mathematics Teacher 37: 166-169; April 1944.

Woodby, Lauren G. The Content of a Junior College Course in Mathematics for the Purpose of General Education. School Science and Mathematics 53: 717-726; December 1953.

Woodrow, H. The Relation Between Abilities and Improvement with Practice. Journal of Educational Psychology 29: 215-230; 1938.

Woodrow, Herbert. The Effect of Practice on Groups of Different Initial Ability. Journal of Educational Psychology 29: 268-278; 1938.

Woody, Clifford. Types of Arithmetic Needed in Certain Types of Salesmanship. Elementary School Journal 22: 505-520; March 1922.

Wren, F. L. and Rossmann, Ruby. Mathematics Used by American Indians North of Mexico. School Science and Mathematics 33: 363-372; April 1933.

Yorke, Gertrude Cushing. A Study of Weights and Measures. Mathematics Teacher 37: 125-128; March 1944.

Yorke, Gertrude C. Three Studies on the Effect of Compulsory Metric Usage. Journal of Educational Research 37: 343-351; 1944.

Young, Florence M. Causes for Loss of Interest in High School Subjects as Reported by 651 College Students. Journal of Educational Research 25: 110-115; 1932.

Zahn, Karl G. A Design for Class Testing Mathematics Textbook Materials. Two-Year College Mathematics Journal 3: 29-32; Fall 1972.

Students gained significantly in mathematical knowledge when new textbook material was used with small-group discussions and daily quizzes. [a; —; college]

Zant, James H. A Program for Determining the Mathematical Needs of Engineering Students. Mathematics Teacher 43: 91-94; March 1950.

Zerbe, Hobson M. The Elements of Plane Geometry in Plane Trigonometry. School Science and Mathematics 30: 1020-1024; December 1930.

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## 2. LIST OF DISSERTATIONS

Note: In this listing, several abbreviations are used:

(a) Dis. Abst. refers to Dissertation Abstracts.

(b) Dis. Abst. Int. refers to Dissertation Abstracts International.

(c) COSC refers to Colorado State College published listing.

(d) PSU refers to The Pennsylvania State University published listing.

Abplanalp, William Edward. The Design and Implementation of a Pre-Calculus Course Using Individualized Instruction. (University of Pittsburgh, 1972.) Dis. Abst. Int. 33A: 4110; February 1973.

Mathematics and science majors having individualized instruction had higher achievement scores and more favorable attitudes toward the course and toward mathematics than did students in traditionally instructed classes. [e; 118 students; 13]

Abramson, Murray. Programmed Instruction in a Development of the Rational Number System. (Columbia University, 1968.) Dis. Abst. 29A: 4362-4363; June 1969.

Abshire, Myrtis Jane. A Study of the Preservice Education, Inservice Education, and Problems and Needs Identified by Elementary School Teachers of Mathematics. (McNeese State University, 1973.) Dis. Abst. Int. 34A: 3196; December 1973.

Only one-third of the teachers had had a graduate mathematics content course and only one-fourth had had a graduate mathematics methods course. Other information on background and needs was cited. [s; 965 teachers; elementary in-service]

Ackermann, Arthur Frank, Jr. Toward a Programming Language for Writing and Checking Mathematical Discourses. (University of North Carolina at Chapel Hill, 1972.) Dis. Abst. Int. 33B: 1495-1496; October 1972.

A formal programming language for writing and checking proofs is defined and its computer processing requirements are specified. Attempts at verifying some simple semantic inferences for a discourse on finite geometry are reported. [d; --; (college)]

Addleman, Edrice Anne Reynolds. The Effect of Games, Desensitization, Discovery, and Instruction on Attitudes Toward Mathematics. (East Texas State University, 1972.) Dis. Abst. Int. 33A: 1501; October 1972.

Use of games, desensitization of fear, or discovery experiences each resulted in "numerical achievement" gains, but no significant differences in attitude, self-concept, or problem-solving scores were found. [e; 4 groups; college]

Agan, Robert Dwain. A Study of the Achievement of Tutored Versus Non-Tutored College Freshmen. (The University of Iowa, 1971.) Dis. Abst. Int. 32A: 1207; September 1971.

No significant difference in performance was found between high-risk students tutored or not tutored in mathematics. [e; 67 students (34 in mathematics, political science); 13]

Aichele, Douglas Bruce. Predicting Success in Basic Concepts of Modern Mathematics From Selected Test Scores and High School Measures. (University of Missouri, Columbia, 1969.) Dis. Abst. Int. 30A: 3623; March 1970.

No significant attitude changes resulted from a terminal mathematics concepts course, though grades and performance were (predictably) higher than for those in a college algebra course. High school GPA and percentile rank were correlated highest with success in the course. [f; 65 students; college]

Aiken, Lewis Roscoe, Jr. Mathemaphobia and Mathemaphilia: An Analysis of Personal and Social Factors Affecting Performance in Mathematics. (The University of North Carolina, 1960.) Dis. Abst. 21: 1992; January 1961.

Albig, David L. A Study of the Effects of Verbalization on Concept Formation in Mathematics. (The Florida State University, 1973.) Dis. Abst. Int. 34A: 632; August 1973.

The hypothesis that requiring a student to verbalize a newly discovered mathematical concept interferes with his ability to use that concept was not confirmed. [e; 118 students; elementary preservice]

Alden, Jay. The Effects of Overview and Retrogressive Vs. Progressive Sequencing on Achievement and Motivation in a Serial Task. (Hofstra University, 1973.) Dis. Abst. Int. 34A: 4074-4075; January 1974.

Retrogressive sequencing appeared better than progressive sequencing for an ellipse construction task only when no overview was presented. [e; 48 students; college, adult]

Alexander, Forrest Doyle. An Experiment in Teaching Mathematics at the College Level by Closed-Circuit Television. (George Peabody College for Teachers, 1961.) Dis. Abst. 22: 2805; February 1962.

Al-Hadad, Sabah. Mathematical Art, An Approach to Developing Aids for Teaching Mathematics. (Arizona State University, 1972.) Dis. Abst. Int. 33A: 3938; February 1973.

A collection of 30 items of mathematical art was considered to have some potential for use as a teaching aid. [s; 226 viewers; secondary, college]

Allen, Erneat Edgar. Selected Characteristics of Junior High Level Mathematics Teachers in Colorado. (University of Northern Colorado, 1970.) Dis. Abst. Int. 31B: 7412; June 1971.

Most teachers indicated that they felt confident to teach junior high school mathematics, but wanted to take more work in mathematics or mathematics education. [s; 320 teachers; secondary in-service]

Allen, Merry Lewis. An Investigation of the Relationship Between Written Teacher Comments on Classroom Tests and Achievement in and Attitudes Toward College Mathematics. (University of Virginia, 1972.) Dis. Abst. Int. 33A: 1013; September 1972.

Written comments on tests did not appear to affect achievement or attitude scores. [e; 6 groups; college]

Allison, Joe Franklin. Effects of an Experimental Study Aid on Achievement in Plane Trigonometry of Texas A & M University Students. (Texas A & M University, 1969.) Dis. Abst. Int. 31A: 275; July 1970.

Students who used booklets specifying objectives, textbook references, and application problems achieved significantly higher in plane trigonometry than a group not using the booklets. [e; 537 students; college]

Alspaugh, John William. A Survey of Secondary Mathematics Programs in Missouri with Emphasis on Content, Procedures, and Preparation of Teachers. (University of Missouri, 1965.) Dis. Abst. 26: 5259-5260; March 1966.

Alton, Elaine Vivian. An Experiment Using Programed Material in Teaching a Noncredit Algebra Course at the College Level [with] Supplement. (Michigan State University, 1965.) Dis. Abst. 26: 4488; February 1966.

Ames, John H. An Evaluation of Mathematics Concepts of Prospective Elementary Teachers at California State College Long Beach. (University of California, Los Angeles, 1971.) Dis. Abst. Int. 32A: 3830; January 1972.

Achievement was significantly higher after a methods course, but did not increase significantly during student teaching. Students with more than six hours of mathematics credits scored significantly higher than those with less than six hours. [e; 72 students; elementary pre-service]

Amthor, William Dale. An Experimental Comparison of Three Methods for Presenting Selected Concepts of Descriptive Geometry. (Texas A & M University, 1967.) Dis. Abst. 28A: 1976; December 1967.

Anderson, John Robert. A Comparison of Student Performance in a One Year Freshman College Calculus Course Resulting From Two Different Methods of Instruction. (Purdue University, 1970.) Dis. Abst. Int. 31A: 3980; February 1971.

A techniques course using an intuitive approach to notation, followed by an advanced calculus course, resulted in significantly better performance than an integrated calculus and advanced calculus sequence in which notation was stressed. [e; 51 students (4 classes); 13]

Anderson, Osiefield. The Role of Counterexamples in a First Course in Calculus. (The Ohio State University, 1970.) Dis. Abst. Int. 31B: 4185-4186; January 1971.

No significant difference was found in the achievement of groups having counterexamples or only examples. [e; 60 students; 13]

Anderson, Tommie Marie. The Achievement in Mathematics and Science of Students in the Negro Schools and Colleges in Mississippi. (Indiana University, 1958.) Dis. Abst. 19: 2281; March 1959.

Angelo, Joseph Samuel. A Study of the Differences Between the Concept of the Nature of Mathematics Held by Freshmen and That Held by College Faculty. (University of Pittsburgh, 1970.) Dis. Abst. Int. 31A: 2123; November 1970.

Freshmen rated computation and symbol orientation topics significantly higher, while faculty rated topics associated with logic, structure, and proof significantly higher. Ratings of seniors were more like those of faculty than of freshmen. [s; 37 faculty, 51 seniors, 214 freshmen; 13, 16, college faculty]

Annis, Richard Hayes. Applicability Ratings of College Mathematics Courses for Secondary School Mathematics Teacher Preparation. (The University of North Dakota, 1965.) Dis. Abst. 26: 5889-5890; April 1966.

Archer, Cass Louis. A Critical Analysis of Significant Problems Encountered in Mathematics Programs by Junior Colleges Changing to Senior Colleges. (The University of Texas, 1967.) Dis. Abst. 28A: 3870; April 1968.

Archer, Julian Andrew. Effect of Concrete, Semi-Concrete, and Abstract Teaching Methods on Mathematical Achievement, Transfer, and Retention at the College Level. (George Peabody College for Teachers, 1972.) Dis. Abst. Int. 33A: 1580; October 1972.

No significant difference in achievement was found between groups who used or did not use aids. However, there was some indication that use of concrete materials facilitated achievement, retention, and transfer. [e; 33 students; college]

Arcidiacono, Michael John. A Comparison of the Effects of a Team Teaching Method, Involving Prospective Student Teachers, and a Lecture Method on the Achievement and Attitudes of College Intermediate Algebra Students. (University of Oregon, 1970.) Dis. Abst. Int. 31A: 5262; April 1971.

No significant differences in achievement or attitude scores were found between groups using a team teaching or lecture method. [e; 40 students; college]

Arendsen, Carl Gene. A Use of Audio-Tutorial Techniques in Arithmetic for a Remedial College Algebra Class. (Michigan State University, 1971.) Dis. Abst. Int. 32A: 4915-4916; March 1972.

The mean score of the group using ten modules was significantly higher than scores of control groups. [e; 77 students; college]

Armstrong, Lee Harold. Development and Evaluation of the Use of Pedagogical Subject Matter Involving Dienes Blocks Within an Individualized Routine in a CUPM Level I Mathematics Course for Elementary Education Majors. (The Florida State University, 1973.) Dis. Abst. Int. 34A: 5768; March 1974.

No significant differences in achievement were found between groups using Dienes blocks and individualized assignments or having lectures. Attitudes were comparable in the groups having or not having a pedagogical sequence with the blocks; these groups had more positive attitudes than the lecture group did. [e; 70 students; elementary pre-service]

Armstrong, Robert Owen. The Construction of Exercises for Undergraduate Mathematics Courses by the Application of Diophantine Analysis and Other Techniques. (University of Georgia, 1971.) Dis. Abst. Int. 32B: 5906; April 1972.

Techniques of exercise construction were determined, and a collection of good exercises presented. [d; --; college]

Arnsdorf, Edward Ernest. An Informal Analytic Approach to Geometric Proofs. (University of Idaho, 1970.) Dis. Abst. Int. 31A: 3364; January 1971.

The group using the informal approach to proofs achieved better than the group writing formal proofs. [e; 2 groups; college]

Arquiza, Lino Quizon. A Testing Instrument for Predicting Freshman College Success at a Philippine University. (Stanford University, 1963.) Dis. Abst. 24: 1069-1070; September 1963.

Asal, Kareem S. A Comparative Study of Academic Achievement in Upper-Division Mathematics Courses of Mississippi Junior College Transfer Students and Native Students Who Graduated During the Years 1949 to 1968 From the University of Mississippi with a Major in Mathematics. (The University of Mississippi, 1970.) Dis. Abst. Int. 31A: 4480-4481; March 1971.

Students from junior colleges performed at least as well in upper-division mathematics courses as students enrolled in the four-year university program. [f; --; junior college, college]

Atkinson, Ronald Olin. A Study of the Effects of Using Flowcharts in Basic Mathematics with Adults. (George Peabody College for Teachers, 1973.) Dis. Abst. Int. 34B: 3905; February 1974.

No significant differences were found in the achievement of groups using or not using flowcharts. [e; 96 students; adults]

Atwood, Harry Mason. An Analysis of Achievement by Selected Superior University of Wisconsin Freshmen with Implications for the Development of Enrichment Materials for High School Mathematics. (The University of Wisconsin, 1958.) Dis. Abst. 19: 1669-1670; January 1959.

Austin, Joe Dan. An Experimental Investigation of the Effect of Three Instructional Methods in Basic Probability and Statistics on Cognitive and Affective Variables. (Purdue University, 1972.) Dis. Abst. Int. 33A: 2810; December 1972.

Students having a pictorial or a manipulative-plus-pictorial approach achieved better than students having a symbolic presentation. No attitude differences were found. [e; 71 students; college]

Avenoso, Frank J. An Experimental Study of Student Achievement and Attitude in a Firat Year Community College Mathematica Coursa for Libaral Arts Students in Relation to Class Size and Follow-Up Conferences. (New York University, 1971.) Dia. Abst. Int. 32B: 2843-2844; November 1971.

No aignificant differences in attitude or achievement were found batween groups having or not having follow-up conferences in either large or amall clasaes. [e; 432 students; 13 (community college)]

Avila, Ramon Luis. A Study of the College Algebra and Trigonometry Placement Procedures and Program for Mathematics Majors and Minors at Ball State University. (The University of Michigan, 1969.) Dis. Abst. Int. 30B: 2281-2282; November 1969.

Babcock, James Gray. An Experimental Study to Determine the Effects That Creative Problem-Solving Situations Have Upon Creative Thinking Ability and Visual Thinking Ability of Selected Students Enrolled in College Descriptive Geometry Classes. (Utah State University, 1969.) Dis. Abst. Int. 30B: 3659-3660; February 1970.

A course in descriptive geometry including instruction on creative problem-solving did not improve visual thinking ability or achievement in the course, but did improve creative thinking ability. [e; --; 15, 16]

Backens, Vern William. The Effect of Teaching Beginning College Mathematics by Television. (North Texas State University, 1970.) Dis. Abst. Int. 31A: 5143-5144; April 1971.

No significant differences in achievement were found between groups taught by television or conventionally; attitudes were more favorable toward conventional instruction. [e; 160 students; 13]

Backman, Carl Adolph. A Study of Teacher Characteristics Related to Teaching Geometry in the Elementary School. (Syracuse University, 1969.) Dis. Abst. Int. 31A: 258-259; July 1970.

Teachers answered correctly approximately 45 per cent of the items on geometry and teaching geometry tests. Attitudes toward geometry were slightly favorable. [s; 65 teachers; elementary in-service]

Badgley, Ralph Emerson. A General Studies Curriculum in Science and Mathematics for Colleges of Education in Oregon. (University of Colorado, 1956.) Dis. Abst. 19: 69; July 1958.

Baker, Truman Dale. A Study of the Nature of Proof in Algebraic Systems. (The University of Mississippi, 1969.) Dis. Abst. Int. 30A: 2239; December 1969.

Bailey, Frank Arnold. A Model Core Curriculum in Mathematics for Four Fields of Non-Engineering Technology in the Two-Year College. (Auburn University, 1972.) Dis. Abst. Int. 33A: 4048; February 1973.

A 23-module branching core curriculum was developed. [--; --; junior college]

Bailey, Howard Lloyd. A Study of the Competence in Geometry of Undergraduate Elementary Education Majors. (Colorado State College, 1969.) Dis. Abst. Int. 30A: 4297-4298; April 1970.

Seventy per cent of the students scored 70 per cent or less on a geometry test based on content from children's texts. Those who had a high school geometry course or a specific mathematics content course scored higher than those who did not have such a course. [--; 183 students; elementary pre-service]

Bailey, William Thomas. A Study of Group Reaction to and Productivity on a Mathematical Task Involving Productive Thinking. (New York University, 1971.) Dis. Abst. Int. 32A: 2474-2475; November 1971.

Small group activity using productive-thinking materials on calculus was found to be feasible. [a; 4 classes (72 students); 12, 13]

Bair, William Perkins. The Pre-Calculus Mathematics Curriculum in California Community Colleges. (University of Southern California, 1970.) Dis. Abst. Int. 31A: 1501-1502; October 1970.

Pre-calculus courses accounted for about 80 per cent of the mathematics offerings, and were generally traditionally-oriented. [s; 91 teachers (59 colleges); community college]

Baker, Donald Hart. A Study of the Relationships Between Credit in Certain High School Mathematics and Science Courses and Various Aspects of Success at the Michigan College of Mining and Technology. (Michigan State University, 1957.) Dis. Abst. 18: 877-878; March 1958.

Baldwin, Roger Edwin. The Development and Evaluation of Voluntary-Choice Programmed Instruction in Mathematics. (University of Minnesota, 1964.) Dis. Abst. 25: 5008-5009; March 1965.

Baley, John Dennis. Cost-Effectiveness of Three Methods of Remedial Instruction in Mastery Learning and the Relstionship Between Aptitude and Achievement. (University of Southern California, 1972.) Dis. Abst. Int. 33A: 3475; January 1973.

No significant differences in achievement were found between remedial instruction by teacher, teacher assistant, or tape cassette; the second was reported to be least expensive, however. [e; 2 classes; college]

Ball, Stanley Eugene. An Investigation of the Dimensionality of the Mathematics Attitudinal Space of Non-Science Majoring University Students. (New Mexico State University, 1972.) Dis. Abst. Int. 33A: 641-642; August 1972.

Seven attitudinal factors were identified in analyzing scale to assess attitudes. [s; 938 students; college]

Banning, Margaret Neoma Botkin. The Preparation of Prospective Teachers in the Geometry Content of Elementary School Mathematics Texts. (Montana State University, 1971.) Dis. Abst. Int. 32B: 5300; March 1972.

A third geometry course following the regular sequence significantly increased scores on a test on geometry concepts used in elementary school textbooks. [f; --; elementary pre-service]

Barbeau, Alice Mae. A Historical Approach to the Theory of Groups. (The University of Wisconsin, 1968.) Dis. Abst. Int. 29B: 4737; June 1969.

Barberousse, Euell Robert. A Study of General Education Objectives in Selected Areas of the Natural Sciences and Mathematics. (Auburn University, 1966.) Dis. Abst. 27A: 3748; May 1967.

Barnard, James Allan. A Comparison of Two Approaches of Understanding Integer Addition by Prospective Elementary Teachers at Oregon College of Education. (University of Illinois at Urbana-Champaign, 1972.) Dis. Abst. Int. 33A: 5593; April 1973.

Students having a property approach to integer addition appeared to have better understanding immediately after instruction, while students having a theorem approach surpassed them after a retention period. [e; 4 classes; elementary pre-service]

Bartz, Wayne Harlan. A Study of Instructional Techniques Utilizing Programed Learning Materials. Dis. Abst. 24: 5525-5526; June 1964.

Barz, Theresa Josephine. A Study of Two Ways of Presenting Probability and Statistics at the College Level. (Columbia University, 1970.) Dis. Abst. Int. 31B: 5467; March 1971.

An historical-practical-involvement approach appeared to be more effective than a set-theoretic approach. [e; 22 classes; 13]

Basil, Gabriel James. The Effects of Writing Computer Programs on Achievement and Attitude in Elementary Calculus. (University of Pittsburgh, 1974.) Dis. Abst. Int. 35A: 2114-2115; October 1974.

No significant differences in achievement or attitude were found between groups using computer programs or desk calculators. [e; 2 groups; college]

Baskin, John T. The Einstellung Effect in Relation to Mathematics Background. (University of Maryland, 1971.) Dis. Abst. Int. 32A: 5665; April 1972.

Differences in response to the "set" effect were identified, particularly between males and females. [e; 379 students; college]

Bass, Chester Franklin. An Experimental Study of the Effectiveness of Two Methods of Teaching Certain Topics in Plane Trigonometry at the College Level. (Columbia University, 1970.) Dis. Abst. Int. 31B: 4823-4824; February 1971.

The experimenter-taught group using an algebraic approach gained significantly more in understanding of trigonometric concepts than groups using the unit-circle approach. [e; 40 students (2 classes); 13]

Bassler, Otto Call. A Comparison of Two Types of Exercises in Teaching Mathematical Concepts to Prospective Elementary School Teachers. (University of Maryland, 1966.) Dis. Abst. 27A: 978; October 1966.

Batker, Kenneth Edward. Some Multiple Channel Audiovisual Materials in Mathematics and a Comparison of Their Use as Study Aids with Conventional Textbook Assignments. (University of Colorado, 1971.) Dis. Abst. Int. 32A: 6774-6775; June 1972.

Slide-tape materials appeared to teach some concepts better than the textbook did. Use of both text and materials had a favorable effect on highly prepared students, but had adverse effects on low-preparation students. [e; 57 students; elementary pre-service]

Baugher, Richard Wilson. A Comparison of Two Methods of Supervising Students in Descriptive Geometry Classes. (Texas A & M University, 1972.) Dis. Abst. Int. 33A: 4145; February 1973.

Students who worked cooperatively to solve problems achieved significantly higher daily grades, but not weekly or final grades, than students who worked alone. [e; 391 students; college]

Baur, Gregory Ralph. A Study of the Effects of a Creative Classroom, Creative Problems, and Mathematics Educators on the Creative Ability in Mathematics of Prospective Elementary Teachers. (Indiana University, 1970.) Dis. Abst. Int. 31A: 5895; May 1971.

A creative classroom, use of creative problems, and a teacher who was a mathematics educator rather than a pre-mathematician each appeared to effect mean change in creativity ability. [e; 161 students; elementary pre-service]

Bazik, A. Matthew. Evaluation of a Plan for Individualizing Instruction Through Informing Students of Behavioral Objectives in a Mathematics Course for Prospective Elementary School Teachers at Elmhurst College. (Northwestern University, 1972.) Dis. Abst. Int. 33A: 5594; April 1973.

No significant differences were found between students who used self-paced materials with explicit objectives and a smaller group having traditional instruction. [e; 35 students; elementary pre-service]

Beamer, James Edward. A Model for the Evaluation of Educational Projects. (The University of Nebraska, 1971.) Dis. Abst. Int. 32A: 2295; November 1971.

The model was successfully applied to a workshop on mathematics education. [a; 1 class; elementary in-service]

Bean, John Ellis. The Arithmetical Understandings of Elementary School Teachers. (Stanford University, 1958.) Dis. Abst. 19: 708; October 1958.

Beard, Harold Dean. An Evaluation of the Academic Achievement of High-Risk College Students. (The University of Tennessee, 1972.) Dis. Abst. Int. 33A: 3941; February 1973.

Both successful and marginally successful students achieved significant gains on one standardized mathematics test but not another. [f; 844 students; 13]

Beattie, Ian David. The Effects of Supplementary Programmed Instruction in Mathematics on the Mathematical Attitudes and Abilities of Prospective Teachers. (Southern Illinois University, 1969.) Dis. Abst. Int. 30A: 3343; February 1970.

Those who studied six programmed units supplementing a methods course achieved significantly higher scores than those who took only the course. Attitudes improved significantly for both groups, but were not significantly different between the groups. [e; 128 students; elementary pre-service]

Bechtel, Robert Daryl. An Analytic Study of Selected Freshmen Students Assumed to Possess Creative Mathematical Ability. (Purdue University, 1963.) Dis. Abst. 24: 5187-5188; June 1964.

Beck, Eugene Jetome. A Comparison of Two Approaches to Teaching Selected Elements of College Level Descriptive Geometry. (University of Missouti, Columbia, 1968.) Dis. Abst. 29A: 4365-4366; June 1969.

Beck, Matilyn Clark. A Compatative Analysis of Three Methods of Teaching Remedial Algebta on the Junior College Level. (Auburn University, 1970.) Dis. Abst. Int. 31A: 6270; June 1971.

Achievement was higher for students having a lecture-discussion ot multi-method approach than for those using programmed instruction. Failure and withdrawal rates were lowest for the latter group, however. [e; 188 students; juniot college]

Becker, Gerald Anthony. The Development and Organization of Teaching Materials in a Collegiate Mathematics Program for Students of the Non-Physical Sciences, Part II. (State Univetsity of Iowa, 1959.) Dis. Abst. 20: 4119-4120; April 1960.

Bedient, Jack D. Characteristics of High School Mathematics Preparations Associated with Success in Collegiate Mathematics. (University of Colorado, 1966.) Dis. Abst. 28A: 1335-1336; October 1967.

Beers, George S. Some Effects of the Use of Supervised Study with Off-Campus In-Service Classes in Mathematics for Teachers. (The University of Florida, 1967.) Dis. Abst. 29A: 827; September 1968.

Beeson, Richard O'Neil, Jr. Immediate Knowledge of Results and Test Performance. (University of Arkansas, 1970.) Dis. Abst. Int. 31A: 920; September 1970.

No significant differences were found for ten tests given with immediate or delayed knowledge of results, but immediate knowledge was significantly better for the final test. Test anxiety, attitude, and aspitation contributed most to prediction of test performance. [e; 3 groups; 8, college]

Bell, Fredsrick Harold. A Study of the Effectiveness of a Computer-Oriented Approach to Calculus. (Cornell University, 1970.) Dis. Abst. Int. 31A: 1096; September 1970.

The class which wrote and executed computer programs achieved significantly more on tests of understanding of calculus concepts, but were not different from the non-computer-use group on tests of ability to exhibit techniques of calculus. [e; 95 students (2 classes); college]

Bellico, Russell Paul. The Relationship of Selected Factors to Academic Achievement in Economics. (University of Massachusetts, 1970.) Dis. Abst. Int. 31A: 5022; April 1971.

Mathematics achievement was less highly related to economics achievement than was social science achievement. [r; --; college]

Beninati, Albert F. A Study of Articulation Between College and Nigh School Mathematics. (Columbia University, 1963.) Dis. Abst. 25: 317-318; July 1964.

Bennett, Gene Wiley. The Role of Topology in the Preparation of Secondary Mathematics Teachers. (Indiana University, 1971.) Dis. Abst. Int. 32A: 1372; September 1971.

Most colleges offered a course in topology, usually at the undergraduate level, but the course was not required for pre-service programs. [s; 300 colleges; secondary pre-service]

Bentz, Ralph P. Critical Mathematical Requirements for the Program of the Community College. (George Peabody College for Teachers, 1952.)

Berg, Milton Edward. A Plan for the Mathematical Education of Teachers of Secondary School Mathematics in the State of Oklahoma. (Columbia University, 1964.) Dis. Abst. 26: 207; July 1965.

Berman, Stephen Leonard. An Investigation of the Effectiveness of an Intrinsically Programmed Text on Permutations and Combinations for Low Ability College Freshmen. (New York University, 1973.) Dis. Abst. Int. 34A: 656-657; August 1973.

Students using the programmed text improved more in achievement and attitude than students using a regular text. [e; 150 students (6 classes); 13]

Berringer, Dalton Earl. An Examination of Geometric Errors in the WAIS Block Design Test and the Effects Upon Performance as a Function of Spatial Relations Ability. (University of Northern Colorado, 1970.) Dis. Abst. Int. 31A: 6393; June 1971.

Geometric errors on the block designs did not appear to influence students' performance on spatial ability tests. [s, r; 160 students; college]

Bertram, Charles John. Selected Characteristics of Mathematics Teachers in Indiana Public Secondary Schools. (Indiana University, 1971.) Dis. Abst. Int. 32A: 3132; December 1971.

In general, the teachers surveyed felt that too much attention in preparation programs had been directed toward content and too little toward classroom management. [s; 493 teachers; secondary in-service]

Biggs, Nancy Chisholm. A Survey of the Mathematics Education of West Tennessee Elementary School Teachers. (Memphis State University, 1969.) Dis. Abst. Int. 30A: 598-599; August 1969.

Billstein, Richard William. Survey of the Mathematics Program at the University of Montana. (University of Montana, 1972.) Dis. Abst. Int. 33A: 5402-5403; April 1973.

Comparisons were made between the University's courses and those recommended by CUPM and/or offered by other colleges. [d, s; --; college]

Bingham, Ralph Lee. An Investigation into the Relationship Between Advanced Placement in Mathematics and Performance in First Semester Calculus at the University of Texas at Austin. (The University of Texas at Austin, 1972.) Dis. Abst. Int. 33A: 4865; March 1973.

The mean course grade in calculus for students enrolling in pre-calculus first was lower than for students enrolling only in calculus. [r; --; 13]

Birkhead, Velma Vivian Sisson. A Comparative Study of the Effect on the Attitudes of Student Teachers of a Concurrent and a Sequential Design. (Oklahoma State University, 1973.) Dis. Abst. Int. 34A: 5769-5770; March 1974.

No significant differences in attitudes toward mathematics or toward teaching mathematics were found, but the group having methods and student teaching concurrently received more pleasure from teaching while the sequential group was more confident. [e; 151 students; elementary pre-service]

Bishop, Thomas David. A Study of the Computer-Related Mathematics Programs of Secondary Schools and Teacher Education Institutions in Missouri and Adjoining States. (University of Missouri - Columbia, 1970.) Dis. Abst. Int. 31A: 3997-3998; February 1971.

Thirty per cent of the schools offered technically-oriented computer-related courses; 20 per cent used computer time for enrichment and supplementary activities; only one school used the computer for tutorial instruction. Two-thirds of the colleges had a recommended computer-related mathematics course, but only one-fourth included computer-related topics. [s; 20 schools, 100 colleges; secondary, college]

Bitter, Gary Glen. Effect of Computer Applications on Achievement in a College Introductory Calculus Course. (University of Denver, 1970.) Dis. Abst. Int. 31B: 6109; April 1971.

Students who used computer homework assignments achieved significantly higher than those who did not use the computer. [e; 6 classes; college]

Bittinger, Marvin Lowell. The Effect of a Unit in Mathematical Proof on the Performance of College Mathematics Majors in Future Mathematics Courses. (Purdue University, 1968.) Dis. Abst. 29A: 3906; May 1969.

Bjork, Clarence Milford. A Survey of State, College, and Municipal Requirements for High School Teachers of Mathematics (Grades Nine to Twelve). (Columbia University, 1950.)

Blaeuer, David Allan. Gifted College and Secondary Mathematics Students - Process Oriented Case Studies of Creativity. (State University of New York at Buffalo, 1973.) Dis. Abst. Int. 34A: 2454; November 1973.

Characteristics of students nominated as potentially creative were determined in terms of those who were "high creative" and those who were "low creative." [s, c; 34 students (5 secondary, 29 college); secondary, college]

Blanton, Floyd Lamar. The Effect of Having Followed Certain Programs in High School Mathematics on Achievement in the First Course in College Mathematics. (University of Georgia, 1963.) Dis. Abst. 25: 2291-2292; October 1964.

Blanzy, James John. Cognitive Style as an Input to a Mathematics Curriculum System: An Exploratory Study in the Educational Sciences. (Wayne State University, 1970.) Dis. Abst. Int. 31A: 3404; January 1971.

Some facets of cognitive style which may be related to achievement in mathematics were determined. [r; 50 students, 2 teachers; community college]

Bluman, Allan George. Development of a Laboratory Method of Instruction in Mathematics at the Community College. (University of Pittsburgh, 1971.) Dis. Abst. Int. 32A: 1970-1971; October 1971.

No significant difference in achievement was found between groups using a laboratory or a traditional method. Attitudes of the laborstoty group were more favorable. [e; 4 classes; 13 (community college)]

Blyth, Maty Isobel. The Competence of College Algebra Students Who Studied High School Algebra. (University of Michigan, 1950.) Dis. Abst. 10: 77-78; Issue 4, 1950.

Boclair, Nathaniel A., Jr. The Identification of a Mathematics Program for Capable But Poorly Prepared College Freshmen. (Rutgers University, The State University of New Jersey, 1973.) Dis. Abst. Int. 34A: 3900; January 1974.

Topics appropriate for a course for capable but poorly prepared students were determined. The concepts of set and function were thought to be most important. [s; 112 faculty; 13]

Bohigian, Haig Edward. The Foundations and Mathematical Models of Operations Research, with Extensions to the Criminal Justice System. (New York University, 1971.) Dis. Abst. Int. 32B: 5909; April 1972.

Algorithms and models appropriate to operations research were determined; that there are implications for mathematics educators was suggested. [d; --; adult]

Boliver, David Edward. Objectives in Mathematics for the Non-College-Bound Secondary School Student, Utilizing Multidimensional Scaling. (Rutgers University, The State University of New Jersey, 1971.) Dis. Abst. Int. 32A: 5994; May 1972.

Mathematicians preferred objectives closely related to traditional algebra and geometry courses, while teachers had stronger preferences for objectives related to teaching computational skills and social arithmetic. [s; --; teachers in grades 9, 10, mathematicians]

Bolte, John Ray. A Statistical Analysis of the Backgrounds of Students Taking the First Course in Physics at the State University of Iowa. (State University of Iowa, 1962.) Dis. Abst. 23: 2747-2748; February 1963.

Bompart, Billy Earl. The Development of an Undergraduate Program for Prospective Secondary School Mathematics Teachers Based on an Analysis of State Certification Requirements. (The University of Texas, 1967.) Dis. Abst. 28A: 4020; April 1968.

Bottorff, Ralph Sinclair. The Effects of Teaching Uses of Mathematics on Achievement and Attitudes in a Community College Occupational Mathematics Course. (The University of Michigan, 1973.) Dis. Abst. Int. 34A: 4686; February 1974.

Significant differences on some scales of an attitude instrument were found between groups using or not using booklets illustrating uses of mathematics. [e; 106 students; community college]

Bowman, James E. A Study of the Basic Mathematical Skills Needed to Teach Industrial Arts in the Public Schools. (Michigan State University, 1958.) Dis. Abst. 19: 3226-3227; June 1959.

Boyd, Claude Collins. A Study of the Relative Effectiveness of Selected Methods of In-Service Education for Elementary School Teachers. (The University of Texas, 1961.) Dis. Abst. 22: 3531-3532; April 1962.

Boyer, Lee Emerson. College General Mathematics for Prospective Secondary School Teachers. PSU 2: 132-138; 1939.

Bradberry, Helon Styles. A Study of the Participants in the 1959-60 and 1960-61 Academic Year Institutes Sponsored by the National Science Foundation at Six Southeastern Universities. (University of Georgia, 1967.) Dis. Abst. 28A: 2114; December 1967.

Bradley, Lillian Katie. An Evaluation of the Effectiveness of a Collegiate General Mathematics Course. (The University of Texas, 1960.) Dis. Abst. 21: 2528-2529; March 1961.

Brady, Mary Margaret. A Proposed Training Program for Operators of Key-Drive Calculators Based on an Analysis of Work Activities. (New York University, 1957.) Dis. Abst. 18: 1681; May 1958.

Bradshaw, Charles Kenneth. Mathematics Teaching in the Public Secondary Schools of the State of Nevada. (University of California, Berkeley, 1968.) Dis. Abst. 29A: 1148; October 1968.

Brand, Werner E. Competencies Possessed by Secondary School Students and College Students in Arithmetical Fundamentals and Verbal Problems. COSC 14: 8-11; 1952.

Brasch, Beryl E. An Evaluation of Some Predictors of Student Success in Calculus. (University of Denver, 1972.) Dis. Abst. Int. 33A: 2729; December 1972.

The SAT-mathematics score and high school rank were found to be most useful in a prediction equation. [r; 50 students; 13]

Brenton, Beatrice A. An Analysis of the Effectiveness of a Phenomenological Approach in Teaching, as Used in a Teacher Education Modern Mathematics Workshop. (Michigan State University, 1969.) Dis. Abst. Int. 30A: 1892; November 1969.

Brett, William Allen. A Factorial Study of the Items in a Mathematics Placement Test. (The Ohio State University, 1954.) Dis. Abst. 20: 734-735; August 1959.

Brian, Richard Boring. Processes of Mathematics: A Definitional Development and an Experimental Investigation of Their Relationship to Mathematical Problem Solving Behavior. (University of Maryland, 1966.) Dis. Abst. 28A: 1202; October 1967.

Brock, Robert Glenn. The Relationship of Selected Variables to Achievement in English and Mathematics in the Programed Learning Materials at Cape Fear Technical Institute. (North Carolina State University at Raleigh, 1971.) Dis. Abst. Int. 32A: 5522; April 1972.

Entry level and achievement in mathematics were related only for females. Entry level appeared to be a good predictor of achievement on the High School Equivalency Examination. [r; --; adults]

Brockman, Harold William. A Critical Study of the Use of the Terms "Necessary Conditions" in the Teaching of Mathematics. (The Ohio State University, 1962.) Dis. Abst. 24: 193-194; July 1963.

Brown, Charles William. A Study of Factors Related to Student Success in Engineering Curricula at Purdue University. (Purdue University, 1962.) Dis. Abst. 23: 491-492; August 1962.

Brown, Donald Eugene. A Comparison of Certification and Degree Requirements with Secondary School Mathematics Curriculum. (Texas A & M University, 1971.) Dis. Abst. Int. 32A: 5529; April 1972.

It was concluded that the secondary school mathematics teacher preparation program is in keeping with recommendations of study groups, and the teacher is being adequately prepared. [d; --; secondary pre-service]

Brown, Eddie Joe. An Investigation of the Relative Effectiveness of Two Methods of Teaching a Large Sized Undergraduate Mathematics Class. (Oklahoma State University, 1970.) Dis. Abst. Int. 31A: 5145-5146; April 1971.

No significant difference in achievement was found for students using audio-taped or discussion methods. [e; 118 students; college]

Brown, Edward Dietz. Arithmetical Understandings and Attitudes Toward Arithmetic of Experienced and Inexperienced Teachers. (The University of Nebraska Teachers College, 1961.) Dis. Abst. 22: 775; September 1961.

Brown, Gerald William. Teacher Preparation for Elementary School Arithmetic. (Stanford University, 1954.) Dis. Abst. 14: 1627-1628; October 1954.

Brown, Jo Carol. A Comparative Study of Patterns of Pacing and Review in a Pre-Calculus Mathematics Sequence for College Freshmen. (The Ohio State University, 1974.) Dis. Abst. Int. 35A: 794-795; August 1974.

No significant differences in achievement were found between marginal students in the self-paced CRIMEL program and those in the traditional two-course sequence. Other pacing options were also studied. [f; 173 students; 13]

Brown, John David. An Evaluation of the Spitz Student Response System in Teaching a Course in Logical and Mathematical Concepts. (North Texas State University, 1971.) Dis. Abst. Int. 32A: 1971; October 1971.

Students using the Spitz System did not achieve better, have lower anxiety scores, or have better attitudes than those using a lecture-recitation approach. [e; 73 students; 13]

Brown, Suzanne Elizabeth. An Examination of the Importance of the Instructor in the Determination of Student Success in Freshman College Mathematics Courses. (Texas A & M University, 1972.) Dis. Abst. Int. 33A: 1037; September 1972.

Four of six high school variables were found to correlate with achievement in a college mathematics course. Differences in instructor level were found to affect grades. [r; --; 13]

Brunner, Regina Baron. The Construction and Construct Validation of a Reading Comprehension Test of Mathematical Exposition. (Syracuse University, 1971.) Dis. Abst. Int. 32A: 4235-4236; February 1972.

The test, including topology and algebra, was found to have satisfactoty reliability. [s; 589 students; 7 - graduate student]

Brumsvold, Perley Olandus. The Relationship Between Selected School District Variables and Teacher Assignment Based on Preparation. (The University of Iowa, 1966.) Dis. Abst. 27A: 341-342; August 1966.

Buchalter, Barbara Diane Elpern. The Validity of Mathematics Textbook Series in Grades 7-14 with Structure as an Objective. (University of Arizona, 1968.) Dis. Abst. Int. 30A: 198-199; July 1969.

Buckeye, Donald Andrew. The Effects of a Creative Classroom Environment on the Creative Ability of Prospective Elementary Mathematics Teachers. (Indiana University, 1968.) Dis. Abst. 29A: 1801; December 1968.

Buckland, Golden T. Development of a Plan for Mathematics Education at the Appalachian State Teachers College: (Five Years Leading to M.S. in Mathematics Education). PSU 17: 255-259; 1954.

Bullington, Richard E. A Study of the Arithmetic Abilities of Alabama Frashmen Majoring in Elementary Education and of the Relation of Certain Socio-Psychological Characteristics of Those Abilities. (University of Alabama, 1953.)

Burkhart, Sarah Maybelle. A Study of Concept Learning in Differential Calculus. (Columbia University, 1956.) Dis. Abst. 16: 2102; November 1956.

Burnham, Blaine Windsor. Use of the Cloze Procedure to Increase Mathematical Facility. (Arizona State University, 1973 [sic].) Dis. Abst. Int. 33B: 3187; January 1973.

Instruction on the cloze procedure resulted in improved reading ability, but did not affect mathematical facility. [e; 8 classes; college]

Burns, James Alden. The Teaching of Applications in Secondary School Mathematics. (Indiana University, 1970.) Dis. Abst. Int. 31A: 5870; May 1971.

Teachers and teacher educators considered applications a necessary part of secondary school mathematics, and indicated that a mathematical model could be used in teaching applications. [a; --; secondary in-service]

Burnside, Lucy Hamblin. Prediction of Success in Mathematics as a Major Field of Study at the Public Universities in Mississippi. (The University of Mississippi, 1972.) Dis. Abst. Int. 33A: 170; July 1972.

Overall high school GPA was the best single predictor of success in college mathematics; other factors were noted. [r; 197 students; college]

Burris, Joanna S. The Construction, Implementation, and Evaluation of an Individualized Audio-Tutorial Program in Basic Mathematics for College Students. (University of Pennsylvania, 1972.) Dis. Abst. Int. 33A: 1581-1582; October 1972.

The developed program appeared to be effective. [a; --; community college]

Bursack, Bruce Allen. Utilizing Item Sampling Techniques to Scale Affective Reactions to Mathematics. (The Ohio State University, 1969.) Dis. Abst. Int. 30A: 1427; October 1969.

Butler, Ralph Backstrom. Aptitude Test Performance of Negro College Students as Affected by Item Difficulty Sequence, Anxiety Reaction Type, and Sex Differences. (The University of Oklahoma, 1971.) Dis. Abst. Int. 32A: 3776; January 1972.

Quantitative test scores were not affected by item difficulty sequence, anxiety, or sex, but were affected by some interactions among the three factors. [r; 156 students; 14]

Byrkit, Donald Raymond. A Comparative Study Concerning the Relative Effectiveness of Televised and Aural Materials in the Inservice Training of Junior High School Mathematics Teachers. (The Florida State University, 1968.) Dis. Abst. 29A: 1463; November 1968.

Callahan, Leroy G. A Study of Knowledge Possessed by Elementary School Teachers, In-Service and In-Training, of the Cultural, Psychological, and Mathematical Foundations of the Elementary School Mathematics Program. (Syracuse University, 1966.) Dis. Abst. 27A: 4149-4150; June 1967.

Calloway, Elwayne. Required Mathematical Topics for Prospective Junior High School Mathematics Teachers at the University of Arkansas. (University of Arkansas, 1971.) Dis. Abst. Int. 32A: 2521; November 1971.

There was general consistency between the content of textbooks and college course content, except for too-extensive inclusion of calculus in the courses. [d; --; secondary pre-service]

Cammaratta, Don Phillip. A Comparative Achievement Analysis in Regular and Adult Disadvantaged and Non-Disadvantaged Graduated Seniors in Hillsborough County, Florida. (University of South Florida, 1974.) Dis. Abst. Int. 34A: 6931; May 1974.

Achievement in mathematics of regular program graduates was significantly higher than that of adult graduates; no significant difference was found when aptitude was considered. [f; 800 students; 12, adult]

Campbell, William Lester. A Study of the Effectiveness of Supplementing a Mathematics Course for Prospective Elementary Teachers with Materials from Elementary School Mathematics Series. (The University of Michigan, 1970.) Dis. Abst. Int. 31A: 6448; June 1971.

No significant differences in achievement or attitude were found between classes where content from elementary school textbooks was or was not included. [e; 119 students (6 classes); elementary pre-service]

Cantor, Rita Marian. A Laboratory Approach to College Level Mathematics Instruction. (Cornell University, 1973.) Dis. Abst. Int. 34A: 2264; November 1973.

For three of four geometry topics, students using a laboratory approach achieved better than those having a lecture-discussion approach. [e; --; college]

Caponecchi, Waldo Peter. A Comparative Study of an Advance Organizer in Mathematics to Determine Its Effectiveness on Knowledge Acquisition and Retention. (The University of Oklahoma, 1973.) Dis. Abst. Int. 34A: 4077-4078; January 1974.

No significant differences in achievement were found for groups using an advanced organizer or an introductory overview, but some interaction effects were noted. [e; 91 students; college]

Capper, Victor Lewis. The Effects of Two Types of Reinforcement on Drop-outs, Class Attendance, and Class Achievement in a Junior-College, Continuing-Education Mathematics Program. (Arizona State University, 1969.) Dis. Abst. Int. 30A: 2413-2414; December 1969.

Carlisle, Veronica Marguerite. Scores of Predictive Tests Developed at the Tucson Skill Center Compared with Scores Received on the General Educational Development Tests. (The University of Arizona, 1972.) Dis. Abst. Int. 33A: 4041; February 1973.

Tests constructed for mathematics and English were found to be useful as predictors of GED scores. [r; 60 students; adult]

Carlson, Philip Robert. An Investigation of the Effects of Instruction in Logic on Pupils' Success in Proving Theorems in Mathematics. (University of Minnesota, 1971.) Dis. Abst. Int. 32A: 3148; December 1971.

Students who had a unit on logic achieved on tests of proof only slightly better than those not having the unit. [e; 72 students; 13]

Carlson, Stanley Lloyd. Differences in Aptitude, Previous Achievement, and Nonintellectual Traits (Personality, Values, Interest, and Attitude Toward Mathematics) of Freshmen Mathematics Majors and Transfers from the Mathematics Major at the University of Northern Colorado. (University of Northern Colorado, 1970.) Dis. Abst. Int. 31A: 3768; February 1971.

High school mathematics achievement, attitude toward mathematics, and a preference score were significantly different for students continuing as mathematics majors or switching majors. [r; 78 students; 13]

Carr, Dan Baker. An Investigation of an Inservice Education Program for Teachers of Secondary School Mathematics in Selected Parishes of North Louisiana. (The University of Mississippi, 1971.) Dis. Abst. Int. 32A: 3832; January 1972.

No significant differences in achievement or attitude were found between students whose teachers had an in-service program and those whose teachers did not have in-service work. [f; 646 students, 16 teachers; secondary in-service]

Carroll, Edward Major. Competencies in Mathematics of Certain Prospective Elementary School Teachers. (Columbia University, 1964.) Dis. Abst. 25: 5134; March 1965.

Carroll, Emma C. A Study of the Mathematical Understandings Possessed by Undergraduate Students Majoring in Elementary Education. (Wayne State University, 1961.) Dis. Abst. 22: 494-495; August 1961.

Carson, James Edward. The Effects of Programmed Instruction as a Supplementary Teaching Aid in Adult Basic Education at the Ohio State Reformatory, Mansfield, Ohio. (The Ohio State University, 1970.) Dis. Abst. Int. 31A: 4441-4442; March 1971.

No significant differences were found in arithmetic achievement between students using or not using supplementary programmed materials. [f; 62 students; adult]

Carstens, James Conrad. Relationship Between Business Career Objectives and the Supporting Course Business Mathematics. (Colorado State University, 1971.) Dis. Abst. Int. 32A: 4499; February 1972.

Significant achievement differences led to the conclusion that the course should be modified. [s; --; junior college]

Carter, Jack Caldwell. Selected Characteristics of Beginning Science and Mathematics Teachers in Georgia. (University of Georgia, 1967.) Dis. Abst. 28A: 4929; June 1968.

Caruso, George Enrico. A Comparison of Two Methods of Teaching the Mathematical Theory of Groups, Rings, and Fields to College Freshmen. (New York University, 1966.) Dis. Abst. 27A: 3769; May 1967.

Carver, Belford Earl. An Experimental Study Integrating Business Mathematics and Business Machines at Southeastern Louisiana College. (Arizona State University, 1970.) Dis. Abst. Int. 31A: 279-280; July 1970.

No significant differences in achievement were found between students who used or did not use calculators. [e; 90 students; college]

Casebeer, Kelvin Dwight. A Comparison of Two Sequences for Introducing Positional Numeration Systems with a Base to Pre-Service Elementary Teachers. (Oklahoma State University, 1967.) Dis. Abst. 28A: 4930; June 1968.

Cavanagh, Timothy Dennis. The Junior College Mathematics Curriculum. (The Ohio State University, 1965.) Dis. Abst. 26: 6542; May 1966.

Cawelti, Gordon Lou. The Status of Administrative and Instructional Provisions in Ability Grouped Classes of Mathematics and English in Selected Midwestern High Schools. (State University of Iowa, 1962.) Dis. Abst. 23: 2749; February 1963.

Celauro, Francis Louis. Factors Associated with the Retention of Plane Trigonometry. (New York University, 1952.) Dis. Abst. 13: 100-101; Issue 1, 1953.

Chaney, George Lenard. The Effect of a Formal Study of the Mathematical Concept of Limit in High School on Achievement in a First Course in University Calculus. (University of Kansas, 1967.) Dis. Abst. 28A: 2884-2885; February 1968.

Chase, Dayton Keith. A Study to Identify the Basic Skills Needed with Adding and Calculating Machines for Office Positions with Implications for Improvement of Instruction in Office Machines. (The University of North Dakota, 1965.) Dis. Abst. 26: 5906-5907; April 1966.

Chinn, James Albert. A Comparative Study of an Audio-Tutorial and a Traditional Method of Teaching Intermediate College Algebra to the Community College Students. (Florida Atlantic University, 1973.) Dis. Abst. Int. 34B: 2154; November 1973.

While no significant differences in mathematics achievement were found, interaction effects favored the audio-tutorial method. [e; 186 students; community college]

Christofferson, Harold W. Geometry Professionalized for Teachers. (Teachers College, Columbia University, 1933.)

Clark, Donald D. The Mathematical Competencies of Elementary Teachers in Selected Utah School Districts. (Brigham Young University, 1974.) Dis. Abst. Int. 34A: 5470; March 1974.

Teachers achieved a mean score of 29 on the 65-item test. Intermediate-level teachers scored significantly higher than primary-level teachers. [s; 12 districts; elementary in-service]

Clark, John Ferguson. A Study of the Relative Effectiveness of Some In-Service Programs in Modern Mathematics on Second and Seventh Grade Teachers in Nine Northeastern California Counties. (University of California, Berkeley, 1967.) Dis. Abst. 28A: 2578-2579; January 1968.

Clark, Lawrence Mozell. An Evaluation of the Remedial Mathematics Program at Virginia State College. (University of Virginia, 1967.) Dis. Abst. 28A: 2593-2594; January 1968.

Clark, Marion Elmo. A Critical Analysis of the Objectives and Content of Mathematics for Liberal Education at the College Level. (University of Virginia, 1962.) Dis. Abst. 23: 4255-4256; May 1963.

Clark, Moses. Set Theory, Logic and Number Theory as Part of a One-Year Mathematics Curriculum for College Capable Students with Mathematical Deficiencies. (Rutgers University, The State University of New Jersey, 1973.) Dis. Abst. Int. 34B: 3352-3353; January 1974.

Students appeared to achieve successfully using the developed program. [a: 66 students; 13]

Clarkson, Donald Robert. The Effect of an In-Service Summer Institute on Mathematical Skills, Understandings, and Attitude Toward Mathematics of Elementary School Teachers. (The University of Connecticut, 1968.) Dis. Abst. 29A: 3019; March 1969.

Clayton, McLouis. The Differential Effects of Three Types of Structured Reviews on the Learning and Retention of Mathematics. (North Carolina State University at Raleigh, 1973.) Dis. Abst. Int. 35A: 904-905; August 1974.

Reviews were found to enhance learning and retention. The testing-with-explanation review appeared to be the most effective. [e; 201 students (9 classes); 6, 8, 10, 11, 13]

Cleminson, Robert Alan. A Comparison of Attitudes and Achievement Between Elementary Mathematics Method Classes Receiving Instruction Through Two Different Methodologies--Teacher-Oriented Large Group Instruction and Student-Oriented Small Group Discussion. (The University of Iowa, 1972.) Dis. Abst. Int. 33A: 3450; January 1973.

Students taught by large-group instruction made significantly more gain in content and attitude scores than those working in small groups. No significant differences were found in methods scores. [e; 2 classes (70 students); elementary pre-service]

Cline, Russell Walter. Constructing and Evaluating Practice Exercises in Mathematics for Students of Vocational Agriculture in Arizona. (Ohio State University, 1940.)

Clucas, Helen Selfridge. The Relative Effectiveness of Three Methods of Teaching Elementary Algebra in Community Colleges When Sex and Abilities of the Student Are Considered. (University of Southern California, 1972.) Dis. Abst. Int. 33A: 1582-1583; October 1972.

Achievement scores were significantly higher for students using programmed instruction rather than an audio-tutorial or conventional approach; however, the dropout rate was also higher. [e; 473 students; community college]

Cohen, Donald Robert. Cognitive Style as a Basis for Individualizing Instructional Sequences. (State University of New York at Albany, 1972.) Dis. Abst. Int. 34A: 1174; September 1973.

No significant interaction effects were found between two sequences and type of student style; however, achievement was low, with little possibility for variance. [e; 116 students; junior college]

Coleman, Ralph H. An Analysis of Certain Components of Mathematical Ability, and an Attempt to Predict Mathematical Achievement in a Specific Situation. (Indiana University, 1956.) Dis. Abst. 16: 2062; November 1956.

Coleman, Sandra B. The Effect of Aging on Piaget's Developmental Stages: A Study of Cognitive Decline. (Temple University, 1973.) Dis. Abst. Int. 34A: 1122; September 1973.

Younger women were not consistently functioning at the formal operations stage on conservation tasks; aging women were at the concrete level, with some regression toward the pre-operational stage. [s; 100 women; ages 20-94]

Colgan, Richard Thomas. A Longitudinal Study of the Relationship of Teacher Judgment Versus Objective Test Data with Respect to College Success. (Southern Illinois University, 1968.) Dis. Abst. 29A: 3413-3414; April 1969.

Collagan, Robert Bruce. The Construction and Evaluation of a Programmed Course in Mathematics Necessary for Success in Collegiate Physical Science. (The Catholic University of America, 1968.) Dis. Abst. Int. 30A: 1070-1071; September 1969.

Collier, Charles Patrick. The Formal-Informal Dimensions of Attitude Toward Mathematics and Mathematics Instruction of Prospective Elementary Teachers. (The University of Wisconsin, 1969.) Dis. Abst. Int. 31A: 660-661; August 1970.

After 1-3 courses, high achievers had a more informal view of mathematics than did low achievers, with some variation. Students planning to teach grades K-2 had more formal views of mathematics instruction than those planning to teach grades 3-8. [--; --; elementary pre-service]

Comley, Robert Edward. A Study of Mathematical Achievement and Attitudes of UICSM and Non-UICSM Students in College. (University of Illin Illinois, 1966.) Dis. Abst. 27A: 3609-3610; May 1967.

Congdon, Allan Ray. Training in High School Mathematics Essential for Success in Certain College Subjects. (Teachers College, Columbia University, 1930.)

Connellan, Miriam Elizabeth. The Content of Secondary School Mathematics Courses Taught in Colorado by Teachers Who Attended the 1957-58 and the 1958-59 Colorado Academic Year Institutes. (University of Colorado, 1962.) Dis. Abst. 23: 541; August 1962.

Conroy, David E. The Effects of Age and Sex Upon a Comparison Between Achievement Gains in Programmed Instruction and Conventional Instruction in Remedial Algebra I at Northern Virginia Community College. (The American University, 1971.) Dis. Abst. Int. 32A: 5102; March 1972.

As age increased, achievement with either type of instruction decreased. No significant differences were noted for sex. [e; --; community college (ages 17-53)]

Cook, Cleland Vern. A Study of the Preservice Education of Secondary Mathematics Teachers. (University of South Dakota, 1969.) Dis. Abst. Int. 30A: 3824-3825; March 1970.

Most of the teachers felt adequately prepared to teach mathematics. A sequence of courses was recommended, including courses in statistics and computer science. [s; 63 teachers; secondary in-service]

Cook, Hollis L. Mathematics of Value in the Training of Industrial Research Engineers. (George Peabody College for Teachers, 1952.)

Cook, James Marvin. Learning and Retention by Informing Students of Behavioral Objectives and Their Place in the Hierarchical Learning Sequence. (University of Maryland, 1970.) Dis. Abst. Int. 31A: 1112; September 1970.

Students in a mathematics course who were informed of the behavioral objectives and/or learning hierarchy did not achieve significantly better than an uninformed group on an immediate achievement test, but those who were given statements of objectives showed a positive gain in performance after two weeks. [e; 80 teachers; elementary pre-service]

Coon, Dorothy Trautman. The Intuitive Concept of Limit Possessed by Pre-Calculus College Students and Its Relationship with Their Later Achievement in Calculus. (The Ohio State University, 1972.) Dis. Abst. Int. 33A: 1537; October 1972.

Less than half of the students could demonstrate that they clearly understood the concept of limit. [s; 39 students; college]

Coon, Lawrence Allen. Long Term Effects of Acceleration on Undergraduate Calculus Students in the CRIMEL Program at the Ohio State University. (The Ohio State University, 1973.) Dis. Abst. Int. 34B: 3911; February 1974.

Students using the CRIMEL program at an accelerated pace achieved less than non-CRIMEL or non-accelerated-CRIMEL students, but had a higher "survival" level. [f; --; college]

Coon, Lewis Hulbert. School Mathematics Study Group Mathematics as a Factor Influencing Success in Freshman Calculus. (Oklahoma State University, 1963.) Dis. Abst. 25: 4475; February 1965.

Cooper, Matthew Nathaniel. To Determine the Nature and Significance, If Any, of Certain Differences in the Social and Personal Adjustment of Fifty-One Successful and Fifty-One Non-Successful College Students at Texas Southern University. (New York University, 1955.) Dis. Abst. 16: 497; March 1956.

Copley, Walter Patrick. The Construction and Validation of an Instrument to Measure the Attainment of Certain Mathematical Concepts Recommended by the Committee on the Undergraduate Program in Mathematics. (Boston University School of Education, 1971.) Dis. Abst. Int. 32A: 1954-1955; October 1971.

The reliability of the test (composite score) was found to be .85. [s; 5505 students; secondary pre-service]

Corkern, Henry Earl. An Experimental Study to Compare the Relative Effects of Four Techniques of Instruction on the Learning of College Algebra. (University of Southern Mississippi, 1972.) Dis. Abst. Int. 33A: 1583-1584; October 1972.

No significant differences in achievement were found between groups having varied combinations of tests and homework. [e; 4 classes (116 students); college]

Cornish, Norman Kester. The Issue of College Mathematics in General Education. (The Ohio State University, 1965.) Dis. Abst. 26: 3777; January 1966.

Corotto, Loren Vincent. An Evaluation of Selected Aspects of the Mathematics Program at the University of Houston. (University of Houston, 1958.) Dis. Abst. 19: 1084-1085; November 1958.

Coughlin, Sister Francetta. A Study of the Effectiveness of a Modified Liberal Arts Mathematics Course in the Mathematical Preparation of Prospective Elementary Teachers. (The University of Michigan, 1968.) Dis. Abst. Int. 30A: 185; July 1969.

Counts, Sarah. Achievement in College Mathematics as a Function of Instructors' and Students' Patterns of Primary Mental Abilities. (University of Chicago, 1952.)

Cox, Linda Ann Simon. A Study of Pupil Achievement in Mathematics and Teacher Competence in Mathematics. (University of Kansas, 1970.) Dis. Abst. Int. 31A: 2767-2768; December 1970.

While a positive relationship was found between hours in methods courses and "competence level" of teachers, pupil achievement was not found to be affected by teacher's knowledge of mathematics. [r; 1034 pupils, 24 teachers; 3, 6, teachers]

Cossens, Charles Richard. A Comparison of Two Techniques of Teaching Engineering Descriptive Geometry. (Texas A & M University, 1965.) Dis. Abst. 26: 3778; January 1966.

Craven, Sherralyn Denning. An Investigation of Methods of Teaching a Development of the Real-Number System in College Mathematics. (University of Kansas, 1968.) Dis. Abst. Int. 30A: 1072; September 1969.

Creswell, Doris E. An Exploratory Study to Determine Techniques for Evaluating the Application of an Information System to Curriculum Decision-Making in Elementary School Mathematics. (The Pennsylvania State University, 1971.) Dis. Abst. Int. 33A: 140; July 1972.

The PRIMES information system was found to be reliable and useful. Teachers did not gain in mathematical knowledge from applying PRIMES to curriculum decision-making. [e; 81 teachers; elementary in-service]

Creswell, John L. An Analysis of the Relationships of Selected Factors to Mathematics and Arithmetic Competency of Prospective Elementary Teachers in Georgia. (University of Georgia, 1963.) Dis. Abst. 24: 2374-2375; December 1963.

Croswhite, F. Joe. Procedures for Admission with Advanced Standing in Mathematics at The Ohio State University. (The Ohio State University, 1964.) Dis. Abst. 25: 6427; May 1965.

Crothamel, David Allen. High School Mathematics Related to College Freshman Science: A Comparison of Teacher Opinion on Use and Achievement. (The University of Michigan, 1972.) Dis. Abst. Int. 33A: 5963; May 1973.

Findings on the use and achievement of 23 mathematics items, rated by high school mathematics teachers and college science teachers, were reported. [s; 347 teachers; secondary, college teachers]

Crouch, Kathleen Duncan. The Application of Group Counseling and Behavior Modification Procedures to Number Anxiety in a College Population. (University of Georgia, 1970.) Dis. Abst. Int. 31A: 5758-5759; May 1971.

Use of systematic desensitization procedures or group counseling did not result in greater achievement or lessened anxiety. [r; 275 students; college]

Crouthamel, Willard William. The Development of Statistics Using Simulation, Computer Assisted, and Linking Concept Techniques. (Auburn University, 1969.) Dis. Abst. Int. 30A: 3629; March 1970.

A statistics problem-solving unit was developed. [d; —; college]

Crowcroft, Harry Gordon. The Effect of Verbalization of Individually Derived Mathematical Generalizations on Transfer at Two Age Levels. (University of Maryland, 1973.) Dis. Abst. Int. 34A: 3233; December 1973.

No significant differences were found between students who verbalized or did not verbalize generalizations for arithmetic and geometric tasks. [e; 157 students (86 secondary, 71 college); 10, college]

Cruikshank, Douglas Edwin. An Analysis of Selected Textbooks Currently Used for Preservice Professional Courses in Teaching Elementary School Mathematics. (University of Oregon, 1968.) Dis. Abst. 29A: 2134; January 1969.

Cummins, Kenneth Burdette. A Student-Experience-Discovery Approach to the Teaching of the Calculus. (The Ohio State University, 1958.) Dis. Abst. 19: 2292-2293; March 1959.

Cunningham, Warren Dean. An Evaluation of an Audio-Tutorial Algebra Course at the Junior College Level. (Arizona State University, 1973.) Dis. Abst. Int. 33A: 5431-5432; April 1973.

No significant difference in achievement was found between students having an audio-tutorial or conventional program. Costs for the former were lower. [e; 4 classes; community, junior college]

Curtis, Ethel Louise. A Study of the Mathematical Backgrounds of Students Who Are Preparing To Be Elementary Teachers and Who Are Enrolled in Certain Colleges in Minnesota. (University of Minnesota, 1955.) Dis. Abst. 16: 2391; December 1956.

Dahlke, Richard Martin. A Case Study of an Individualized Course in Arithmetic at a Community College. (The University of Michigan, 1971.) Dis. Abst. Int. 32A: 6287; May 1972.

Attitudes toward the course were favorable. Achievement-related factors were also considered. [s; 113 students; community college]

Dalrymple, Charles O. Fractions in Business and Life. (Boston University, 1934.)

Daniels, John William. Effects of Interaction Analysis Upon Teaching Assistants and Student Achievement in Introductory College Mathematics. (Indiana University, 1970.) Dis. Abst. Int. 31A: 2768-2769; December 1970.

Training in interaction analysis had a significant effect on the indirectness and flexibility of teaching assistants. There was a significant difference in the achievement of students taught by mathematics education assistants and those taught by mathematics assistants. [e; 8 teachers, 211 students; 13]

Daugherty, Boice Neal. The Influence of the Value and Size of Objects on Estimation of Their Numerousness. (University of Kentucky, 1965.) Dis. Abst. Int. 30B: 2434; November 1969.

Davidson, Neil Andrew. The Small Group-Discovery Method of Mathematics Instruction as Applied in Calculus. (The University of Wisconsin, 1970.) Dis. Abst. Int. 31A: 5927; May 1971.

Procedures used in the course were described. [a; 12 students; 13]

Davis, John B., Jr. An Investigation of the Interaction of Certain Inatructional Strategies with the Structure of Basic Mental Abilities in the Learning of Some Mathematical Operations. (The Florida State University, 1967.) Dis. Abst. 28A: 2551-2552; January 1968.

Davis, Josephine Dunbar. Functions of a Real Variable: Part of a Mathematics Curriculum for Capable But Poorly Prepared College Freshmen. (Rutgers University, The State University of New Jersey, 1973.) Dis. Abst. Int. 34A: 3827; January 1974.

Achievement and attitudes were higher for students using the developed unit. [e; 73 students; 13]

Davis, Miriam Shannon. Creative Mathematics Instruction: The Method of R. L. Moore. (Auburn University, 1970.) Dis. Abst. Int. 31A: 5927; May 1971.

The educational and psychological foundations of Moore's method are discussed. [d; —; college]

Davis, Thomas Edwin, III. A Matrix Theory Course for the Junior College. (Auburn University, 1969.) Dis. Abst. Int. 30A: 3855; March 1970.

Objectives and content for the course were structured. [d; —; junior college]

Davis, Thomas F. An Evaluation of a Graduate Program in Mathematics for Experienced Secondary School Teachers Sponsored by the National Science Foundation at the University of Detroit, 1958-1969. (Wayne State University, 1972.) Dis. Abst. Int. 33A: 6054; May 1973.

Increases in professional and personal status, teaching qualities, leadership activities, and knowledge of and confidence in teaching of mathematics were reported. [s; 119 teachers; secondary in-service]

Dayoub, Iris Mack. An Investigation and Evaluation of Goals of Mathematics Education for Prospective Elementary Teachers. (Georgia State University, 1973.) Dis. Abst. Int. 34A: 4952-4953; February 1974.

A set of 265 test items was judged for importance by 20 mathematics educators. [s; 20 educators; elementary pre-service]

Deatsman, Gary Allen. Efficiency of Time Use By Above Average Pre-Service Elementary School Teachers Learning Mathematics in Independent Study Sessions. (Arizona State University, 1971.) Dis. Abst. Int. 32A: 3113; December 1971.

No significant difference in time to complete a unit was found between students having independent study or lecture-discussion instruction. [e; 31 students; elementary pre-service]

DeBoer, Delmer D. A Comparative Study of the Effects of a Computer-Oriented Approach to Introductory Calculus. (George Peabody College for Teachers, 1973.) Dis. Abst. Int. 34B: 3912-3913; February 1974.

No significant effects on achievement or attitude were found for students using computers. [a; 2 classes (44 students); college]

DeLong, Douglas Dean. An Introduction to Computer Programming for Elementary or Junior High School Teachers. (University of Northern Colorado, 1973.) Dis. Abst. Int. 34A: 198; July 1973.

Programming achievement and attitude toward mathematics significantly increased following lessons requiring computer use. [a; 1 class; elementary and secondary pre- and in-service]

Dennis, Clarence Earl. A Study of the Effects of Devoting Part of the College Algebra Class Period to Supervised Study. (George Peabody College for Teachers, 1972.) Dis. Abst. Int. 33B: 1659-1660; October 1972.

Below-average students achieved significantly better when having supervised study; no differences were found for other students. [e; 3 classes; college]

Dettmers, Ronald Dale. An Experimental Comparison of Three Methods of Teaching Mathematical Logic to Prospective Elementary Teachers. (The University of Michigan, 1969.) Dis. Abst. Int. 31A: 661-662; August 1970.

There were no significant differences on a logic test between the group taught logic with continuing reinforcement and one taught logic alone, but both scored significantly higher than a group not taught logic. On general mathematics achievement, no difference was found. [e; --; elementary pre-service]

Dickens, Charles Henderson. Effect of In-Service Training in Elementary-School Mathematics on Teachers' Understanding and Teaching of Mathematics. (Duke University, 1966.) Dis. Abst. 27A: 1684-1685; December 1966.

Dickey, Ouida Word. A Study of the Effects of Three Schedules of Reinforcement Upon Achievement and Retention in a Linear Program in College Business Mathematics. (University of Georgia, 1966.) Dis. Abst. 27A: 3363-3364; April 1967.

DiPietro, Alphonso Joseph. A Program in Mathematics Education for West Virginia Teachers of Secondary Mathematics. (George Peabody College for Teachers, 1956.) Dis. Abst. 17: 569; March 1957.

Disko, Mildred Anne. Development of a Test to Measure Mathematics Processing Skills. (Ohio University, 1973.) Dis. Abst. Int. 34A: 5710-5711; March 1974.

The developed test was found to have a reliability of .87. [a; 291 students; college]

Dixon, Billy Gene. Mathematical Concepts That a Teacher of the First Two Years of Secondary School Algebra Must Understand in Order to Effectively Use the "New Mathematics" Curriculum Materials. (Southern Illinois University, 1967.) Dis. Abst. 28A: 3551-3552; March 1968.

Dobyns, Roy Armstead. An Experiment with Programed Instruction in Teaching College Algebra. (George Peabody College for Teachers, 1963.) Dis. Abst. 24: 1936-1937; November 1963.

Dockweiler, Clarence J. A Study of the Impact of a CUPM Inspired Mathematics Course on the Level of Mathematical Understanding of Lutheran Elementary School Teachers. (Northwestern University, 1970.) Dis. Abst. Int. 31A: 4001; February 1971.

Teachers who had a course in Mathematical Analysis had a better understanding of elementary school mathematics than those who had taken Intermediate Algebra. [s; 176 teachers; elementary in-service]

Dodd, David Harvey. Rule Learning Transfer Effects. (University of Colorado, 1967.) Dis. Abst. 29B: 386; July 1968.

Dolney, Edwin Leo. The Effects of the Use of a Unit on Mathematical Logic in Freshman College Analysis. (University of Illinois at Urbana-Champaign, 1971.) Dis. Abst. Int. 32A: 5531; April 1972.

A 12-day logic sequence appeared to aid achievement in formal aspects of mathematics. [e; 2 classes; 13]

Donnelly, Mona Mary. A Study of Elementary Teachers' Personality Traits and Attitudes Toward Teaching Selected Content Areas in the Elementary School. (University of Illinois at Urbana-Champaign, 1971.) Dis. Abst. Int. 32A: 5648-5649; April 1972.

Student teachers had more favorable attitudes toward mathematics than toward teaching mathematics; no significant differences were noted for teachers. [s; 184 teachers; elementary in-service, pre-service]

Donovan, Sister Mary Matthew. A Study of Selected Data Relative to the Education of Texas Teachers of Secondary School Mathematics in Order to Suggest a Program for Their Future Education. (University of Houston, 1956.) Dis. Abst. 16: 1228-1229; July 1956.

Dossett, Mildred Jerline. An Analysis of the Effectiveness of the Workshop as an In-Service Means for Improving Mathematical Understandings of Elementary School Teachers. (Michigan State University, 1964.) Dis. Abst. 26: 209-210; July 1965.

Dossey, John Arthur. The Relative Effectiveness of Four Strategies for Teaching Disjunctive Concepts in Mathematics. (University of Illinois at Urbana-Champaign, 1971.) Dis. Abst. Int. 32A: 5467; April 1972.

The CEC (Characterization-Exemplification-Characterisstion) strategy was more effective than the ECE strategy. The example approach appeared better than the non-example approach. [e; 320 students; college]

Douthitt, Cameron Bennett. A Study of the Effects of a Laboratory in College Freshman Mathematics. (University of Houston, 1971.) Dis. Abst. Int. 32A: 3662; January 1972.

Use of a laboratory appeared to be effective. [e; 206 students; 13]

Downs, Richard Ray. A Personality Assessment of College Seniors Majoring in Mathematically Related Fields. (Ball State University, 1973.) Dis. Abst. Int. 34A: 4735-4736; February 1974.

The assessment system identified several personality patterns of mathematics students. [s; 52 students; 16]

Drennen, Robert Lee, II. The Effect of Specific Performance Objectives on Student Achievement, Attitude and Attrition in Remedial Mathematics at Jefferson State Junior College. (Auburn University, 1971.) Dis. Abst. Int. 32A: 4325; February 1972.

Some advantages in using performance objectives were reported. [e; 120 students; junior college]

Driscoll, John Gerard. The Integral as a Linear Operator on a Function Algebra: A Pedagogically Based Approach to a Topic in Calculus. (Columbia University, 1969.) Dis. Abst. Int. 30B: 4690; April 1970.

Student materials for the course were developed and discussed. [d; 1 class; college]

Drum, Randell Leland. The Effects of Supplementary Programmed Instruction on the Mathematical Understanding and Attitude Toward Mathematics of Prospective Elementary School Teachers. (East Texas State University, 1973.) Dis. Abst. Int. 34A: 7083-7084; May 1974.

No significant differences in achievement or attitude were found between groups using programmed instruction or having only the traditional lecture-discussion course. [e; 64 students; elementary pre-service]

Drushel, J. A. Arithmetical Knowledges and Skills of Prospective Teachers. (New York University, 1927.)

Ducharme, Robert Gerald. The Development of a Computer Oriented Linear Algebra Course. (The Florida State University, 1973.) Dis. Abst. Int. 34A: 3828-3829; January 1974.

The text materials developed for the course were described. [d; 1 class; 14]

Dukeshire, Mabel E. An Experimental Study of the Relative Effectiveness of the Lecture Method of Teaching and the Lecture Method Supplemented by a Self-Teaching Workbook. (Rutgers - The State University, 1966.) Dis. Abst. 27A: 1539-1540; December 1966.

Duncan, David Roger. The Effects of Instruction in Selected Mathematical Topics on Attitudes Toward Mathematics of College General Mathematics Students. (The University of Michigan, 1970.) Dis. Abst. Int. 31A: 6467-6468; June 1971.

Effects of three units on aspects of attitude were reported. [—; 771 students; college]

Dunigan, Nancy Casey. Factors Related to Success and Failure of Transfer and Native Students in Mathematics Courses in the University of Southern Mississippi. (Northwestern University, 1974.) Dis. Abst. Int. 35A: 3454; December 1974.

Significant differences were found between transfer students from junior college and students in the four-year college. [s; 1996 students; junior college, college]

Durham, Lawrence Bradley. The Efficacy of Extrastatement Clues in the Solution of Mathematical Word Problems. (University of Delaware, 1972.) Dis. Abst. Int. 33B: 3189-3190; January 1973.

The presence of date-chart and one other clue type facilitated problem-solving achievement, as did the presence of all three clue types. [a; 248 students; college]

Durkee, Beverly Corinne. A Study of the Effects of Three Homework Procedures on Achievement in College Algebra. (Arizona State University, 1972.) Dis. Abst. Int. 33B: 813; August 1972.

Either collecting homework or giving quizzes appeared better than giving no homework or quizzes. [e; 6 classes; college]

Eatle, James Hubett. An Expetimental Compariaon of Three Self-Instruction Formats for Descriptive Geometry. (Texas A & M Univeraity, 1964.) Dis. Abat. 26: 1497; September 1965.

Eetle, Timothy Christopher. Intuitive and Analytical Thinking in Consistent and Inconsistent Multiple-Cua Learning Tasks. (University of Oregon, 1972.) Dis. Abst. Int. 33B: 2318; November 1972.

Intuitive students performed better than analytical atudents on an inconsistent task, while analytic atudents performed better on a consistent task. [e; --; college]

Eatlley, Harry Wayne. Academic and Professional Preparation of Secondary School Teachets of Mathematics. PSU 17: 275-278; 1954.

Easton, Stanley Evan. The Relation Between Certain High School Courae Patterns and Achievement in Firat Freahman Coursea in English, Social Science, Mathematics, and Natural Science at Louisiana State University. (The Louisiana State Univeraity and Agricultural and Mechanical College, 1970.) Dis. Abat. Int. 31A: 4378; March 1971.

High school coutse patterns were aignificantly related to achievement in mathematics (and the other thtee ereas). [r; 2191 atudents; 13]

Edwards, Ronald Robert. Predicting Succeas in Remediation Programs in Mathematica for the Public Community Junior College. (The Univeraity of Connecticut, 1971.) Dia. Abat. Int. 32A: 2432; November 1971.

Five factots were used in the prediction equation. [r; 359 atudents; junior college]

Ehrenpreis, Waltet. The Algorithmic Approach to Curriculum Construction in Mathematica: A Field Approach. (Univeraity of Pennsylvania, 1972.) Dis. Abat. Int. 33A: 1414; October 1972.

Scandura's algorithmic approach was found to be feasible as a basis for constructing a curriculum. Making rulea explicit facilitated learning, and uae of higher-order rules aided tranafer. [e; --; college]

Eisenberg, Theodote Allen. The Intagration of Modified Learner-Generated Sequences Into the Development of a Behaviorally Stated Learning Hierarchy, as Applied in Mathematica Curricula Construction. (Univeraity of Maryland, 1970.) Dis. Abat. Int. 31A: 4033-4034; Februaty 1971.

A learning hierarchy developed by students was found to be successful with other high-achieving students but not with low-achieving students. [a; 16 students; elementary pre-service]

Elder, Harvey Lynn. The Effects of Teaching Certain Concepts of Logic to College Algebra Students on Verbalizations of Discovered Mathematical Generalizations. (University of Illinois, 1968.) Dis. Abst. 29B: 2522-2523; January 1969.

Elias, Walter, Jr. An Empirical Test of the Effect of Varying the Sequence of Three Topics in College Algebra and Trigonometry. (Wayne State University, 1971.) Dis. Abst. Int. 32A: 6097; May 1972.

Effects of varying the sequence were noted; using polynomial-rational, exponential-logarithmic, and then trigonometric functions was recommended. [e; --; college]

Elliott, Portia Clareon. Elementary Mathematics Teacher Training Via A Programming Language. (University of Massachusetts, 1974.) Dis. Abst. Int. 35A: 297; July 1974.

A course for pre-service teachers in which APL was used to clarify selected topics in mathematics is described and evaluated. [a; --; elementary pre-service]

Emery, Harriett Elenor. Mathematics for Prospective Elementary Teachers in a Community College: A Comparison of Audio-Tutorial and Conventional Teaching Materials and Modes. (Michigan State University, 1970.) Dis. Abst. Int. 31A: 5930; May 1971.

The group using audio-tutorial materials achieved more than the conventionally-taught group. A significant correlation between attitude and achievement was found only for the conventionally-taught group. [e; 77 students; elementary pre-service]

Epting, Zola Wylie. A Comparison of the Effectiveness of Selected Methods of Teaching Junior College Mathematics. (The University of Florida, 1971.) Dis. Abst. Int. 32A: 5668; April 1972.

No significant differences were found between programmed instruction, lecture-discussion, or lecture methods. [e; 3 classes (70 students); junior college]

Erickson, Barney Lee. Effects of a College Mathematics Sequence Upon the Attitudes and Achievement in Mathematics of Prospective Elementary School Teachers. (Utah State University, 1970.) Dis. Abst. Int. 30A: 5337; June 1970.

Students' achievement and attitude toward mathematics changed significantly during a two-quarter mathematics sequence. [s; 117 students; elementary pre-service]

Ernst, Charles Irven. Affective Behavior of High-Ability University Freshmen Whose Achievement in Mathematics is Low. (The Ohio State University, 1968.) Dis. Abst. 29A: 3037-3038; March 1969.

Espigh, Mettill Alvin. A Comparison of Two Guided Discovery Strategies and an Expository Strategy for Teaching College Freshmen Proof of Theorems Based Upon the Field Axioms. (The Florida State University, 1974.) Dis. Abst. Int. 35B: 934-935; August 1974.

Significant differences favored the "revised discovery" strategy only on the retention test. [e; 66 students; 13]

Estes, Robert Abbott. The Effect of Translation Practice and Group Participation in Solving Verbal Problems for Prospective Elementary Teachers. (The University of Michigan, 1970.) Dis. Abst. Int. 31A: 6274-6275; June 1971.

Students working in small groups to solve problems made greater individual gains in problem solving than did students who worked alone. [e; 120 students; elementary pre-service]

Evans, James Lee. An Investigation of "Teaching Machine" Variables Using Learning Programs in Symbolic Logic. (University of Pittsburgh, 1960.) Dis. Abst. 21: 680-681; September 1960.

Evans, Joe S. An Experimental Study of the Readability of Textbooks as a Factor in Achievement in College Algebra. (George Peabody College for Teachers, 1971.) Dis. Abst. Int. 32B: 2279-2280; October 1971.

No significant differences in achievement or attitude were found between groups using materials at three readability levels. [e; 3 classes; 13]

Everett, Joseph Price. A Comparison of Student Achievement and Retention Under Two Similar Definitions for the Sine and Cosine Functions. (The Florida State University, 1972.) Dis. Abst. Int. 33A: 3948-3949; February 1973.

Use of the circular function or complex-valued function appeared equally effective. [e; 2 groups; college]

Ewing, Patrick McCoy. A Study of the Effects of Individualizing the Pacing and Instruction of Elementary Algebra at the College Level. (The Ohio State University, 1973.) Dis. Abst. Int. 35A: 212; July 1974.

Use of the individualized procedure resulted in a lower attrition rate; no achievement differences were found. [f; 2380 students; college]

Exum, Kenith Gene. Evaluation of a Metric Booklet as a Supplement to Teaching the Metric System to Undergraduate Non-Science Majors. (University of Southern Mississippi, 1972.) Dis. Abst. Int. 33A: 1973; November 1972.

The booklet was found to be effective in teaching the metric system. [a; 6 classes (306 students); college]

Fair, George Washington. The Development of Sequential Competencies and an Instructional Device for Counting Money for Adults Classified as Mentally Retarded. (University of Pittsburgh, 1974.) Dis. Abst. Int. 35A: 3550; December 1974.

A hierarchy of competencies was verified, and the use of proportional rods was found to facilitate the attainment of four competencies. [a; 60 adults; adults (MRs)]

Fairbank, Benjamin Ayer. Experiments on the Temporal Aspects of Number Perception. (University of Arizona, 1969.) Dis. Abst. Int. 30B: 403; July 1969.

Farmer, Loyal. The Predictive Validities, as Measured by Multiple Correlation, of Certain Mathematics Grades and a Test Battery Using Academic Achievement as Criteria. (North Texas State University, 1970.) Dis. Abst. Int. 32A: 1850; October 1971.

Use of equations involving multiple predictors was reported to be more effective than use of a single predictor. [r; --; college]

Farr, Roberta Siegel. Personality Variables and Problem Solving Performance: An Investigation of the Relationships Between Field-Dependence-Independence, Sex-Role Identification, Problem Difficulty and Problem Solving Performance. (New York University, 1968.) Dis. Abst. 29A: 2561-2562; February 1969.

Fehlen, Joan Elizabeth. A Study of Selected Variables Associated with Mastery Learning in a College Mathematics Course for Prospective Elementary Teachers. (University of Minnesota, 1973.) Dis. Abst. Int. 34A: 4055; January 1974.

Use of diagnostic progress tests with or without tutorial help produced consistently higher achievement and attitude scores than when diagnostic tests were not used. [e; 127 students (77, plus 50 in replication); elementary pre-service]

Feldman, Harold. The Development of a Workbook-Textbook in Business Mathematics for Students Enrolled in the Business Administration Departments of Community Colleges. (New York University, 1957.) Dis. Abst. 18: 940-941; March 1958.

Fenneman, Glenn Carl. The Validity of Previous Experience, Aptitude, and Attitude Toward Mathematics as Predictors of Achievement in Freshman Mathematics at Wartburg College. (University of Northern Colorado, 1973.) Dis. Abst. Int. 34A: 7100-7101; May 1974.

Predictor variables for various courses were determined. [r; 196 students; 13]

Fentress, Neal Talmadge. Mathematics Faculty Development in Community-Junior Colleges. (The University of Alabama, 1973.) Dis. Abst. Int. 34A: 6409; April 1974.

Activities considered important by department chairmen were determined. [s; --; community, junior college]

Ferguson, Frank Fred. Competence in Geometry of Prospective Elementary School Teachers at Chadron State College. (University of Northern Colorado, 1972.) Dis. Abst. Int. 33B: 5386-5387; May 1973.

Students who had a high school or college geometry course, a mathematics content course, or a methods course achieved better on a developed geometry test. [s; 189 students; elementary pre-service]

Fiedler, Leigh Allan. A Comparison of Achievement Resulting from Learning Mathematical Concepts by Computer Programming Versus Class Assignment Approach. (The University of Oklahoma, 1969.) Dis. Abst. 29A: 3910-3911; May 1969.

Fields, Ewaugh Finney. A Study of Changes in the College Preparatory Mathematics Curriculum and Institute Attendance of Mathematics Teachers in Public Secondary Schools of New Jersey During 1964-1967. (Temple University, 1969.) Dis. Abst. Int. 31A: 1114-1115; September 1970.

About two-thirds of the teachers had attended NSF institutes. While vectors and calculus had been added to some curricula, the correlation between changes and institute attendance was only .28. [s; 833 teachers, 152 department chairmen; secondary in-service]

Finco, Arthur Anthony. Mathematics Majors and Transfers from the Mathematics Major at Purdue University: Temperament, Interest, Value, and Student Questionnaire Differences at the Exploratory Stage. (Purdue University, 1966.) Dis. Abst. 27A: 327-328; August 1966.

Fisher, Guy Lee. A Construct Validation Study of the Taxonomy of Educational Objectives Utilizing the Content Area of Mathematics. (Washington State University, 1973.) Dis. Abst. Int. 34A: 4908; February 1974.

Support was not found for Bloom's comprehension, application, or analysis levels. [d; --; 13]

Fithian, Ephraim B., Jr. The Effects of a Coordinated Mathematics Content and Methods Sequence on Prospective Elementary Teachers. (Indiana University, 1971.) Dis. Abst. Int. 32A: 5085; March 1972.

Students in the coordinated sequence achieved significantly higher in mathematics content, but not on teaching of mathematics tests, than did those who had either a methods or a content course. Attitudes improved for those in the methods course and in the coordinated sequence. [e; 135 students; elementary pre-service]

Fitzgerald, David Leon. A Study of the Effect of a Mathematics Laboratory Upon the Performance of Prospective Elementary Teachers Enrolled in a Mathematics Class for Elementary Teachers. (University of Houston, 1971.) Dis. Abst. Int. 32A: 4465; February 1972.

Students who received one-half or one-third of their instruction using mathematics laboratory procedures did not achieve differently nor have different attitudes from those in a lecture-discussion group. [e; 73 students; elementary pre-service]

Flaherty, John Joseph. Concept Attainment as a Function of Type of Concept, Extent of Pretraining, and Method of Presentation. (Boston University School of Education, 1972.) Dis. Abst. Int. 33A: 1511; October 1972.

"Conjunction" required the fewest number of card choices, while "conditional" required the most. Pretraining and presentation mode affected concept attainment. [e; 80 students; college]

Flanagan, Starling Stuart. The Effects of Courses Employing School Mathematics Study Group Texts on Students' First Semester Grades in College Mathematics. (University of Virginia, 1968.) Dis. Abst. 29A: 2433; February 1969.

Flatt, James Levern. The Relative Effectiveness of Three Types of Follow-Up When Teaching Remedial Mathematics by Television. (George Peabody College for Teachers, 1965.) Dis. Abst. 26: 6738; May 1966.

Fleischmann, Ray Wendell. A Comparison of Two Methods of Instruction in Mathematics for Elementary Teachers. (Oklahoma State University, 1970.) Dis. Abst. Int. 31A: 5246; April 1971.

The group having short quizzes had greater achievement than those having longer tests on more material. [e; 861 students; elementary pre-service]

Plexer. Roberta Joy Lichtenstein. A Comparison of Lecture and Laboratory Methods in a Mathematics Course for Prospective Elementary Teachers. (University of Colorado, 1973.) Dis. Abst. Int. 34A: 6496; April 1974.

No significant differences in achievement or attitude were found between groups taught by laboratory or lecture approaches. [e: 8 groups: elementary pre-service]

Flores, Mario Meza. Relationships Between Mathematical Education and Economic Production in Six Latin American Countries from 1960 to 1970. (Columbia University, 1973.) Dis. Abst. Int. 34A: 3703-3704; January 1974.

Data suggested the existence of relationships between economic production and mathematics education levels in the countries studied. [r; --; adult]

Foley, Jackie Lee. Effectiveness of Instruction for Teachers of Elementary School Mathematics in Large Groups with Small Discussion Groups. (The University of Florida, 1965.) Dis. Abst. 26: 4329; February 1966.

Forbes, Douglas Robert. The Texas System: R. L. Moore's Original Edition. (The University of Wisconsin, 1971.) Dis. Abst. Int. 32B: 4062; January 1972.

Moore's method is described and discussed. [d; --; college]

Ford, Patrick L. The Mathematics Included in Programs for the Education of Secondary School Teachers in the Southern Association. (University of Missouri, 1962.) Dis. Abst. 23: 543: August 1962.

Forman, Richard William. An Analysis of the Advanced Placement Program in Mathematics at the University of Illinois and Other Selected Colleges and Secondary Schools. (University of Kansas. 1968.) Dis. Abst. Int. 30A: 203-204; July 1969.

Forrest. Thomas Douglas. An Experiment in Teaching the Complex Number System in Basic Mathematics for College Students. (George Peabody College for Teachers. 1971.) Dis. Abst. Int. 32B: 2282; October 1971.

It was concluded that the formal approach to teaching complex numbers may result in greater achievement than the traditional approach. [e: 3 groups; college]

Foster, Kenneth Roger. The Implementation of the CUPM Recommendations for Elementary School Mathematics Teachers Into the Curricula of Certain NCATE-Approved and Non-NCATE-Approved Institutions in the United States. (The University of Tennessee, 1970.) Dis. Abst. Int. 31A: 4596-4597; March 1971.

There were no apparent relationships between the NCATE and non-NCATE institutions in regard to the degree of inclusion of 31 CUPM-recommended topics. More of the number system topics were included, but few of the algebra and geometry topics. [s; 70 colleges; elementary pre-service]

Fournet, Francis Gary, Jr. A Study of Various Factors Related to Success in College General Mathematics. (Louisiana State University, 1963.) Dis. Abst. 24: 5239-5240; June 1964.

Francis, Richard Lee. A Study of the Value of Selected Test Scores for Predicting Success in Analytic Geometry and Calculus. (University of Missouri, 1965.) Dis. Abst. 26: 7166; June 1966.

Frazier, Robert Carl, Sr. A Comparison of an Implicit and Two Explicit Methods of Teaching Mathematical Proof Via Abstract Groups Using Selected Rules of Logic. (The Florida State University, 1969.) Dis. Abst. Int. 30A: 5317-5318; June 1970.

The "completely explicit" method was found to be more effective than the "implicit" or combination method. [e; 55 students; 13]

Fronabarger, Carl Valentine. The Adaptability of College Mathematics Courses to Students of Certain Described Characteristics. (University of Missouri, 1951.) Dis. Abst. 11: 695-697; Issue 3, 1951.

Fty, Dale Eugene. A Comparison of the College Performance in Calculus-Level Mathematics Courses Between Regular-Progress Students and Advanced Placement Students. (Temple University, 1973.) Dis. Abst. Int. 34A: 1768; October 1973.

Advanced placement students were found to achieve at least as well as regular students. [r; --; college]

Fuhrer, Samuel. A Comparison of a Computer-Assisted Testing Procedure and Standardized Testing as Predictors of Success in Community College Technical Mathematics. (New York University, 1973.) Dis. Abst. Int. 34A: 3086-3087; December 1973.

The computer-assisted testing procedure was found to be a better predictor of success than standardized testing procedures. [e; 312 students; community college]

Fuller, Joseph. Basic College Mathematics for Prospective Elementary School Teachers. (University of Pennsylvania, 1945.)

Gabel, Kenneth Eugene. A Study of the Relative Effectiveness of Four Distributions of Weekly Instructional Time in College Freshman Mathematics. (Syracuse University, 1955.) Dis. Abst. 15: 1560; September 1955.

Gallagher, Robert Patrick. Personality Characteristics of Counseling and Mathematics Institute Trainees, Changes That Occur During Training, and Relationships Between Counselor Characteristics and Counseling Potential. (Rutgers - The State University, 1968.) Dis. Abst. 28A: 4908; June 1968.

Gallion, Zachary Taylor. A Determination and Appraisal of the Content of Freshman General Mathematics Courses in Selected Colleges and Universities. (Louisiana State University, 1955.) Dis. Abst. 15: 2061-2062; November 1955.

Gangler, Joseph Michael, Jr. An Experimental Study of the Effects of Participation and Motivation on the Problem Solving Ability of College Freshmen. (Columbia University, 1967.) Dis. Abst. 28B: 2157; November 1967.

Gannon, Gerald Edward. The Development and Appraisal of a Unit on Selected Topics from Topology for Prospective Elementary School Teachers. (University of Northern Colorado, 1972.) Dis. Abst. Int. 33A: 3255; January 1973.

The unit on topology appeared to result in satisfactory achievement and attitude scores. [a; 2 classes (57 students); elementary preservice]

Garber, John Rodney. Characteristics of Students Enrolled in the Guided Studies Program at Rockingham Community College and Their Implications for Curriculum Development. (North Carolina State University at Raleigh, 1971.) Dis. Abst. Int. 32A: 3555-3556; January 1972.

Some arithmetic factors were found to affect achievement in the program. [r; 77 students; community college]

Gardiner, W. L. An Investigation of Understanding of the Meaning of the Logical Operators in Propositional Reasoning. (Cornell University, 1965.) Dis. Abst. 26: 6179-6180; April 1966.

Garner, Meridon Vestal. A Study of the Educational Backgrounds and Attitudes of Teachers Toward Algebra as Related to the Attitudes and Achievements of Their Anglo-American and Latin-American Pupils in First-Year Algebra Classes of Texas. (North Texas State University, 1963.) Dis. Abst. 24: 189; July 1963.

Garnett, Emma Whitlock. A Study of the Relationship Between the Mathematics Knowledge and the Mathematics Preparation of Undergraduate Elementary Education Majors. (George Peabody College for Teachers, 1968.) Dis. Abst. Int. 30A: 1448; October 1969.

Gary, Bryn Edwin. Prediction of Achievement in Analytic Geometry at East Texas State University. (East Texas State University, 1971.) Dis. Abst. Int. 32A: 5059-5060; March 1972.

High school mathematics grades were the best single predictor of achievement, but use of multiple variables was more effective. [r; 99 students; 13]

Gary, Clifton Farrel. Effect of Unannounced Examinations on Achievement, Test Anxiety, and Attitude in Certain Junior College Mathematics Courses. (The University of Oklahoma, 1973.) Dis. Abst. Int. 34A: 1481-1482; October 1973.

Giving unannounced examinations resulted in better achievement, less anxiety, and positive attitudes. [e; 164 students (8 classes); junior college]

Gasaway, Sadie Catherine. The Effectiveness of Continued Testing in Mathematics of Freshmen of Varying Proficiencies at Tennessee Agricultural and Industrial State University. (Cornell University, 1961.) Dis. Abst. 22: 2808; February 1962.

Gaynor, Patricia Ellen. The Effect of Feedback Delay on the Retention of Material at Selected Levels of the Taxonomy in Computerized Mathematical Instruction. (University of Miami, 1973.) Dis. Abst. Int. 34A: 2386; November 1973.

Length of feedback delay or absence of feedback had no effect on the learning of meaningful material. [e; 92 students; college]

Gee, Burton Cleon. Attitudes Toward Mathematics and Basic Mathematical Understanding of Prospective Elementary School Teachers at Brigham Young University. (Oregon State University, 1966.) Dis. Abst. 26: 6528; May 1965.

Geiselmann, Harrison Adam. The Effectiveness of a Mathematics Review Course for Freshmen in the College of Agriculture at Cornell University. (Cornell University, 1955.) Dis. Abst. 16: 1371-1372; August 1956.

Geiss, Almon Lewis. An Analysis of Relationships Between Courses Taken in High School and Success in Specific Areas at Oregon Technical Institute. (Washington State University, 1966.) Dis. Abst. 27A: 51; July 1966.

Gephart, Woodrow Wilson. The Relationship of High School Relative Subject Preference and Relative Achievement with First Year College Relative Accomplishment for Four Academic Subject Areas. (University of Pittsburgh, 1958.) Dis. Abst. 19: 1245-1246; December 1958.

Gerber, Homer C. An Investigation of the Effects of Programmed Instruction in Logical Inferences Upon College Students' Ability to Learn Proof Writing. (The Florida State University, 1971.) Dis. Abst. Int. 34A: 4908-4909; February 1974.

Students who had instruction in logical instances were better able to write proofs. [e; 101 students; college]

Gibb, Allan A. Visual Materials for Teaching the Calculus. (Stanford University, 1951.)

Gibbons, Philip Edward. A Comparative Analysis of the Impact of Various Methods of Instruction on Achievement and Understanding in Mathematics for Elementary Teachers. (Oklahoma State University, 1967.) Dis. Abst. 28A: 4932; June 1968.

Gilbert, Richard Earl. A Study in the Transition from Twelfth Year Mathematics to the Calculus as Viewed by Students and Their Instructors. (State University of New York at Buffalo, 1971.) Dis. Abst. Int. 32A: 2504-2505; November 1971.

Objectives, content, and pedagogical procedures for a high school calculus course were determined by questioning college calculus students. [a; 6 colleges; 13]

Gilbert, Virginia Terlinden. The Relationship of Certain Educational Experiences to the Understanding of Arithmetic by Prospective Elementary Teachers. (Arizona State University, 1966.) Dis. Abst. 27A: 981; October 1966.

Giles, Emory. The Identification of Input Variables Which Are Characteristic of the Latent-Terminal Junior College Student. (University of Minnesota, 1971.) Dis. Abst. Int. 32A: 6127-6128; May 1972.

Mathematics was involved as a characteristic in predicting success for junior college students. [r; 234 students; junior college]

Gillman, Clifford Brian. The Effects of Interstimulus Interval and Feedback on the Time Order Effect in Judgments of Numerousness and Line Length. (Indiana University, 1970.) Dia. Abst. Int. 31B: 2306; October 1970.

Significant differences in discriminability were found as stimulus length varied; there were marked order effects. [e; --; college]

Ginnings, Gerald Keith. The Determination of Major Factors Which Contributed to Success or Failure of First Quarter Freshmen Students in Mathematics, Science, and English at Berry College, Mount Berry, Georgia. (Auburn University, 1966.) Dia. Abst. 28A: 467; August 1967.

Glennon, Vincent J. A Study of the Growth and Mastery of Certain Basic Mathematical Understandings on Several Educational Levels. (Harvard University, 1948.)

Goddard, Alton Ray. Recency of Secondary School Mathematical Preparation as an Influence on First-Year College Mathematics Achievement. (Texas A & M University, 1969.) Dia. Abst. Int. 31A: 288-289; July 1970.

Students who had mathematics courses during the senior year in high school scored significantly better on achievement, grade, and aptitude measures than those who had a comparable amount of mathematics but none during the senior year. [f; 400 students; 13]

Goldstein, William. A Study of Topology as an Area of Mathematics for General Education at the Freshman College Level. (Rutgers - The State University, 1967.) Dis. Abst. 28A: 1718; November 1967.

Goodman, Jesse Samuel. Programmed Instruction, Remedial Treatment, and Resistance to Learning: An Experimental and Exploratory Study of Facilitating and Hindering Factors in Remedial Programmed Instruction. (New York University, 1966.) Dis. Abst. 28A: 496; August 1967.

Gore, Joseph Alvin. Development and Preliminary Evaluation of a Logic Unit for College Freshmen Mathematics Courses. (University of Georgia, 1969.) Dis. Abst. Int. 30A: 5342; June 1970.

A logic unit resulted in no loss of achievement in the course. [e; 8 classes; 13]

Graham, Ray Logan. An Investigation of the Effects of Computers Upon Elementary Analysis. (New Mexico State University, 1968.) Dis. Abst. 29B: 1431; October 1968.

Grasser, Albert A. A Multivariate Analysis of Cognitive Style Elements as They Relate to Aptitude and Achievement Factors in Elementary Algebra. (Wayne State University, 1973.) Dis. Abst. Int. 34A: 6943-6944; May 1974.

Cognitive style appeared to be correlated with aptitude and achievement. [r; 162 students; community college]

Graves, Avis J. Ruthven. The Attainment of Conservation of Mass, Weight, and Volume in Minimally Educated Adults. (The University of Florida, 1971.) Dis. Abst. Int. 33A: 617-618; August 1972.

Level of education and race had little effect on conservation attainment. Scores were 78 per cent for mass, 67 per cent for weight, and 24 per cent for volume conservation. [—; 120 adults; adult]

Gray, James Harold. A Follow-Up Study of the National Science Foundation Summer Institutes for Secondary Teachers of Science and Mathematics Held at the University of Mississippi, 1957-1969. (The University of Mississippi, 1970.) Dis. Abst. Int. 31A: 4597; March 1971.

The NSF institutes were considered worthwhile in increasing knowledge and status of participants. [s; 326 teachers; secondary in-service]

Graybeal, Walter Thomas. Predictive Factors Associated with Achievement and Success in College Algebra. (The University of North Carolina, 1958.) Dis. Abst. 19: 2534; April 1959.

Greabell, Leon Charles, Jr. A Comparison of Mathematical Competency Between Prospective Elementary School Teachers Utilizing a Student Goal Determined Approach to Study Mathematics and Prospective and Elementary School Teachers Enrolled in an Instructor Goal Determined Course in Mathematics. (Syracuse University, 1969.) Dis. Abst. Int. 31A: 1661-1662; October 1970.

Scores in all groups were higher than those reported in other studies, but no meaningful differences were found between groups. [—; —; elementary pre- and in-service]

Green, George F., Jr. The Effectiveness of a Correspondence-Study Method for Teaching Mathematics to In-Service Elementary School Teachers Using Programmed Instruction and Television. (The Florida State University, 1967.) Dis. Abst. 28A: 2580-2581; January 1968.

Graene, Jeaae Hubert. The Businesa Arithmetic Competencies Needed by the Junior College Businesa Graduate in Georgia. (New York University, 1963.) Dia. Abat. 24: 1183-1184; September 1963.

Greenfield, Adelaide. Perceptual Style, Attitudes Toward Problem Solving, and Problem-Solving Performance. (New York University, 1970.) Dia. Abat. Int. 31B: 7571-7572; June 1971.

Positive relationships were found between attitudes and problem-solving performance, and between field dependence-independence and both mathematics and problem solving. Training accounted for more variance than attitude, while attitude was more important than perceptual style. [r; 472 atudents; college]

Greider, Roger Ellis. An Experimental Examination of a Relationship Between Verbal Chaining and Mathematical Concept Acquisition in Undergraduate College Students: An Attempt at a Partial Verification of One Step in Gagne's Hierarchy of Learning Types. (The University of Oklahoma, 1972.) Dia. Abat. Int. 33A: 2236-2237; November 1972.

Three hypotheaes about verbal chaining were verified. [a; 160 atudents; college]

Griffin, James Franklin. Relationship of Selected High School Courses Taken by Industrial Arts Majors to Their College Success. (University of Miaaouri - Columbia, 1970.) Dia. Abat. Int. 31A: 5165-5166; April 1971.

Correlations of mathematics couraes with various industrial arts couraes were reported. [r; 273 atudents; college]

Griffin, John Duncan. North Carolina Elementary School Teachers' Understanding of Contemporary Arithmetic. (Duke Univeraity, 1966.) Dia. Abat. 27A: 3616; May 1967.

Grigaby, Charles Edwin. An Inveatigation Into the Nature of Current Calculus Experiences in the High School and the Relationship Between These Experiences and the Final Achievement Level Reached in the Introductory Calculus Course at the University. (University of North Carolina at Chapel Hill, 1973.) Dia. Abat. Int. 35A: 280; July 1974.

More than half of the atudents had had some calculus instruction in high achool, but no atrong relationship was found with mathematical ebility or calculus achievement. [r; 813 atudents; 13]

Grimes, Bill Ray. A Modern Geometric Development for Elementary School Mathematics Teachers. (Oklahoma State University, 1969.) Dis. Abst. Int. 31A: 4004; February 1971.

More than 100 geometric topics were identified in elementary school textbooks. Teachers need to know language as well as concepts. [d; --; elementary pre- and in-service]

Groomes, Benjamin Herbert. Study of the Academic Performance of Students Participating in an Experimental Curriculum as Compared with Students Enrolled in the Regular Curriculum in the Freshman and Sophomore Years of College at Florida Agricultural and Mechanical University, 1967 to 1969. (The Florida State University, 1971.) Dis. Abst. Int. 32A: 6001-6002; May 1972.

No significant differences in achievement were found between regular or experimental students enrolled in mathematics courses. [s; 200 students; 13, 14]

Grunwald, George B. The Relative Effectiveness of Different Types of Help-Sessions When Teaching Mathematics to a Large Section of Prospective Elementary Teachers. (George Peabody College for Teachers, 1969.) Dis. Abst. Int. 30A: 4874; May 1970.

Large group and small group instruction was equally effective, even for students in the large group given varying forms of help-sessions. Attitudes were not changed, though teaching of arithmetic was viewed with less trepidation after the course. [e; 247 students (2 classes); elementary pre-service]

Guillotte, Henry Philies. Behaviors Exhibited in the Learning of Selected Generalizations in Mathematics. (The University of Connecticut, 1973.) Dis. Abst. Int. 34A: 2458; November 1973.

Significant differences were found in the number of prompts used, but no consistent patterns were observed. [c; 20 students; college (students), mathematics education and psychology (jurors)]

Guth, James Earl. Junior College Transfer Students' Perceptions of the Academic Environment of Their Former Junior College and Auburn University. (Auburn University, 1974.) Dis. Abst. Int. 35A: 3424; December 1974.

Mathematics, science, and engineering students did not perceive a significant difference in the academic environment of the two types of colleges, while social science and education students did. [s; 61 students; junior college, college]

Hageltom, Sidahmed Mohamed Osman. An In-Service Course in Support of UNESCO Mathematics Project for the Arab States. (Columbia University, 1972.) Dis. Abst. Int. 33A: 6216; May 1973.

Participants generally achieved satisfactorily and responded well in the developed course. [s; 22 teachers; secondary in-service]

Haggard, Charles Harmon. A Study of the Mathematical Understanding of Pre-Service Elementary School Teachers in Selected Kentucky Teacher Education Institutions. (University of Kentucky, 1971.) Dis. Abst. Int. 32A: 1957-1958; October 1971.

Students in colleges and universities had a better mathematics background than those in junior colleges. Methods courses in universities appeared to be better than those in colleges. [s; 616 students; elementary pre-service]

Haggard, J. D. College Mathematics for the General Student. (University of Missouri, 1951.) Dis. Abst. 11: 570-572; Issue 3, 1951.

Haigh, William E. Preparation of Senior High School Mathematics Teachers in South Dakota. (Indiana University, 1970.) Dis. Abst. Int. 31A: 2772; December 1970.

Nine per cent of the teachers had fewer than 12 hours of mathematics courses; weaknesses in geometry, probability and statistics were noted, while strength was indicated in algebra and analysis. [s; 274 teachers; secondary in-service]

Hajek, Francis Bernard. A Study of a Learning Set Hierarchy Encountered in Learning the Concept of the Limit of a Function. (Oklahoma State University, 1970.) Dis. Abst. Int. 31A: 5936; May 1971.

Certain ralationships between variables and hierarchies proposed by Gagne were not found in the developed materials. [--; 22 students; college]

Hale, Robert Eugene. An Analysis of Variables Related to Achievement of Graduate Education Students in Introductory Inferential Statistics. (West Virginia University, 1970.) Dis. Abst. Int. 31A: 3777; February 1971.

Some mathematical variables which correlated with achievement in statistics were reported. [r; --; college]

Hall, Alonzo Lee. Business Mathematics Achievement and Career Objectives at the Community College Level. (Colorado State University, 1972.) Dis. Abst. Int. 33A: 2565; December 1972.

No significant relationship was found between achievement and strength of students' objectives. [r; 309 students; community college]

Hall, Jack V. Business Uses of Mental Arithmetic in Ellensburg, Washington. COSC 13: 56-60; 1951.

Hamilton, Elbert W. The Notational System as an Aid to Understanding Arithmetic. (State University of Iowa, 1956.) Dis. Abst. 16: 1849-1850; October 1956.

Hamilton, William Wingo. Doctoral Programs in Mathematics and Education as Related to Instructional Needs of Junior Colleges and Four Year Colleges. (North Texas State University, 1967.) Dis. Abst. 28A: 1985-1986; December 1967.

Hammond, Harry Reginald. Developing Teacher Understanding of Arithmetic Concepts Through In-Service Education. (University of California, Los Angeles, 1964.) Dis. Abst. 25: 5138; March 1965.

Hamrock, Josephine Stephanie. A Comparison of Two Methods of Teaching FORTRAN Programming in an Undergraduate Mathematics Class. (Purdue University, 1974.) Dis. Abst. Int. 35A: 3297; December 1974.

Teaching programming by writing programs to solve mathematical problems appeared more effective than a structured approach. [e; 134 students; college]

Hancock, Robert Ray. A Study of the Interaction Between Sex Difference, Structure-of-Intellect Factors and Two Modes of Teaching a Mathematical Relation. (University of Illinois at Urbana-Champaign, 1972.) Dis. Abst. Int. 34A: 664-665; August 1973.

Significant differences favored the verbal mode of presentation over the figural mode; no significant interaction effects were found. [e; 176 students; college]

Hancox, Frederick James. An Investigation of Programmed Instruction in Mathematics as a Measure of Electronic Achievement. (The American University, 1969.) Dis. Abst. Int. 30A: 1913; November 1969.

Hand, Edith Frances. Evaluation of a Large-Scale Mathematics In-Service Institute for Elementary Teachers. (University of Georgia, 1967.) Dis. Abst. 28A: 2118-2119; December 1967.

Hannelly, R. J. Mathematics in the Junior College. (University of Colorado, 1939.)

Hannon, Herbert Harold. The Mastery of Certain Aspects of Mathematics for General Education by College Students. COSC 15: 58-63; 1953.

Hansen, David Williams. An Investigation of the Effects of Required Homework on Achievement in College Mathematics. (University of Denver, 1972.) Dis. Abst. Int. 33A: 2814-2815; December 1972.

No significant differences were found between homework and no-homework groups on standardized tests, but differences on some instructor-developed tests favored the homework group in trigonometry. [e; 3 classes; community college]

Hansen, John Richard. Evaluation of an In-Service Mathematics Institute for Elementary and Junior High Teachers. (University of Georgia, 1973.) Dis. Abst. Int. 34A: 4958-4959; February 1974.

Achievement was greater for teachers using the televised series on mathematics than for teachers not in the institute. Teachers in grades 7-9 achieved higher scores than teachers in grades 1-3. [f; 1054 teachers (35 classes); in-service (grades 1-9)]

Hanson, Lawrence Eugene. Inductive Discovery Learning, Reception Learning, and Formal Verbalization of Mathematical Concepts. (The Florida State University, 1967.) Dis. Abst. 28A: 1731-1732; November 1967.

Hanson, Robert Alfred. The Relationship Between Different Levels of Preparation in High School Vocational Agriculture, Science, and Mathematics and First Year Achievement in a College of Agriculture. (University of Minnesota, 1958.) Dis. Abst. 19: 1246; December 1958.

Happel, Donald Alfred. Factors Associated with the Extent to Which Iowa Secondary Mathematics Teachers Are Up-to-Date in Mathematics and in the Teaching of Mathematics. (The University of Iowa, 1972.) Dis. Abst. Int. 33A: 6767-6768; June 1973.

Significant differences in scores on a mathematics test were found between teachers with specified professional interests. [s; 350 teachers; secondary in-service]

Harrington, Lester Garth. Attitude Towards Mathematics and the Relationship Between Such Attitude and Grade Obtained in a Freshman Mathematics Course. (The University of Florida, 1960.) Dis. Abst. 20: 4717; June 1960.

Harris, Beverly Howard. An Experiment in Teaching Contemporary Algebra to College Students with Varying High School Algebra Backgrounds. (University of Missouri, 1963.) Dis. Abst. 25: 1744; September 1964.

Harshbarger, Ronald Joseph. Rationale and Design of an Individualized Mathematics Curriculum for Associate Degree Students in Business. (University of Pittsburgh, 1970.) Dis. Abst. Int. 31A: 2253; November 1970.

The developed program appeared to meet curricular goals. Attitudes were favorable, although self-perception of ability did not differ. [e; 7 groups; college]

Hartman, Marlin Elwood. A Study of Self-Supervision in the Implementation of Innovations in Teaching Strategy in Beginning Calculus. (University of Pittsburgh, 1969.) Dis. Abst. Int. 31A: 292; July 1970.

Self-supervision wich "innovetive methods" was reported to be effective. [e; 3 groups; college]

Harvey, Robert Allan. The Interrelationships Among Five Variables in a Mathematics Course for Preservice Elementary Teachers Taught by a Guided Discovery Method. (The University of Tulsa, 1974.) Dis. Abst. Int. 35A: 925-926; August 1974.

Attitude toward mathematics was more highly correlated with achievement than was general scholastic aptitude for students taught by a guided-discovety method. [r; 43 students; elementary pre-service]

Hashmi, Shamim Ahmad. Effect of Previous Academic Achievement on the Performance of First-Year College Students of East Pakistan on the "Verbal Reasoning" and the "Numerical Ability" Subtests of the Differential Aptitude Tests. (Research Study Number 1). (Colorado State College, 1966.) Dis. Abst. 27A: 2391-2392; February 1967.

Haseinger, Dale Eugene. The Relationship of Certain Measures of Scholastic Competency and Previous Scholarship Record to Achievement in Calculus in the Engineering School at Oklahoma State University. (Oklahoma State University, 1961.) Dis. Abst. 23: 151; July 1962.

Haugen, Earl Stuart. A Study of the Validity of the WAIS, SCAT, and STEP as Predictors of Success in College Mathematics. (Research Study No. 1). (Colorado State College, 1964.) Dis. Abst. 28A: 124-125; July 1967.

Haukabo, Gerhard Karroll. An Investigation of the Effect of the Study of Numeration Syatems in the Mathematics Preparation of Future Elementary Teachers. (University of Minnesota, 1967.) Dis. Abst. 28A: 2119-2120; December 1967.

Hayes, David Thomas. Effects of Two Methods of Presenting Homework Upon Attitude, Achievement, and Perceptions of Study Habits in a College Mathematics Course. (The Ohio State University, 1972.) Dis. Abst. Int. 33A: 1538; October 1972.

The personalized homework approach appeared to be preferred by students and resulted in higher achievement than for students receiving a list of assigned problems for the entire course. [e; 4 classes; college]

Hayes, Patrick Louis. Higher Mathematics in the Social and Managerial Sciences. (Carnegie-Mellon University, 1973.) Dis. Abst. Int. 34B: 2158; November 1973.

Applications and techniques of mathematics for economics, psychology, sociology, and management science were formulated. [d; --; college]

Heideman, Robert G. National Science Foundation Academic Year Institutes for Secondary School Teachers of Science and Mathematics Held at the University of Wisconsin 1956-57 Through 1958-59. "An Evaluation of the Background, Training, Placement, and Occupational Mobility of the Participants." (The University of Wisconsin, 1962.) Dis. Abst. 23: 2025; December 1962.

Heidy, Nicholas J. A Comparison of Accelerated and Nonaccelerated Fort Lewis College Baccalaureate Graduates. (University of Northern Colorado, 1971.) Dis. Abst. Int. 32A: 5567; April 1972.

Mathematics scores were higher for accelerated students. [r; 1061 students; college]

Heikkinen, Donald David. A Study of Factors Related to Acceleration in the Study of Mathematics. (The University of Michigan, 1964.) Dis. Abst. 25: 3431; December 1964.

Heimer, Ralph Tinnell. The Preparation of a Program in Contemporary Algebra and a Study of Its Effectiveness for Group Instruction Under Paced Conditions. (The Pennsylvania State University, 1962.) Dis. Abst. 23: 3813-3814; April 1963.

Heintz, Ruth Fuller. Goals in the Cognitive and Affective Domains and a System of Instruction for the Pre-Service Training of Teachers of Elementary School Mathematics. (State University of New York at Buffalo, 1971.) Dis. Abst. Int. 32A: 819-820; August 1971.

A guide for teaching a one-year sequence of mathematics for elementary teachers was developed, utilizing objectives at various taxonomy-levels. [d; --; elementary pre-service]

Heisey, Daniel Joseph. A Characterization of Provers and Nonprovers in an Axiomatic Geometry Course for Elementary Education Majors: A Discriminate Analysis. (Purdue University, 1966.) Dis. Abst. 27A: 413-414; August 1966.

Hendrickson, Arthur Dean. A Study of the Relative Effectiveness of Three Methods of Teaching Mathematics to Prospective Elementary School Teachers. (University of Minnesota, 1969.) Dis. Abst. Int. 31A: 1117; September 1970.

No significant differences in achievement were found between groups using a mathematics laboratory, enrichment problems, or a conventional approath, though all gained. Attitude also improved. [--; 90 students; elementary pre-service]

Hennemann, Willard Walstrum, Jr. An Experimental Investigation of the Use of a Programmed Text on Introductory Calculus as a Term Project in an Introductory College Mathematics Course. (Cornell University, 1966.) Dis. Abst. 28A: 155-156; July 1967.

Henry, George Wilson. A Study of the Effects of Interaction on Achievement of College Students Studying Programed Intermediate Algebra in Groups. (East Texas State University, 1972.) Dis. Abst. Int. 33A: 6791; June 1973.

Individual use of programmed materials appeared better than group use of them. [s; 105 students; college]

Hesch, Elisabeth Beaman. The Nature of Mathematical Evidence and Its Significance for the Teaching of Secondary School Mathematics. (Columbia University, 1955.) Dis. Abst. 16: 507-508; March 1956.

Hickman, J. D. A Study of Various Factors Related to Success in First Semester Calculus. (University of Southern Mississippi, 1969.) Dis. Abst. Int. 30A: 2252-2253; December 1969.

Hicks, Randall Clarke. A Program of Study in Mathematics for Elementary School Teachers Based Upon Exhibited and Derived Needs. (University of Georgia, 1966.) Dis. Abst. 27A: 3341-3342; April 1967.

Higdon, Danny Wallace. A Comparison of Mathematical Attitudes and Competence of Selected Prospective and Experienced Elementary Teachers in the State of Texas During the 1971-72 Academic Year. (University of Houston, 1972.) Dis. Abst. Int. 34A: 202; July 1973.

While attitudes and achievement of pre- and in-service teachers were significantly related, experienced teachers scored higher on applications and attitude measures. [r; 724 pre-service, 284 in-service; elementary pre- and in-service]

Hill, George Lee. The Utilization of Student Motivation Based Upon Specified Needs as a Basis for Instructional Strategy in Lower-Division College Mathematics. (The University of Texas at Austin, 1972.) Dis. Abst. Int. 33A: 4967-4968; March 1973.

No interaction effects between performance or attitude and needs were found. [e; 2 classes; college]

Hills, Barbara Behrens. The Effects of Need for Achievement, Achievement Imagery and Test Anxiety on Arithmetic Performance. (State University of Iowa, 1960.) Dis. Abst. 21: 2002-2003; January 1961.

Hilton, Alice Schafer. The Understandings of Mathematics and the Attitudes Toward Mathematics Expressed by Prospective Elementary School Teachers. (State University of New York at Buffalo, 1969.) Dis. Abst. Int. 31A: 266; July 1970.

Significant increase in achievement was made during the professional sequence, with 69.4 per cent evidencing an increase in mathematical knowledge. Significant positive change in attitudes also occurred, expressed by 75 per cent. Correlations between attitude and achievement were positive. [e; 72 students; elementary pre-service]

Hochberg, Ruth Kahn. Predictive Effectiveness of the Miller Analogies Test and Other Variables for Doctoral Degree Students in the School of Education at Fordham University. (Fordham University, 1972.) Dis. Abst. Int. 33A: 191; July 1972.

Mathematics-science scores were correlated with MAT scores and successful completion of the program. [r; 200 students; graduate students]

Hoff, William Eldridge. A Study of Influences on the Choice of Mathematics or Mathematics Education as an Undergraduate Major. (Oklahoma State University, 1962.) Dis. Abst. 24: 141-142; July 1963.

Hoffman, Larry Dean. Audio-Tutorial Versus Conventional Methods of Teaching Slide Rule. (Iowa State University, 1971.) Dis. Abst. Int. 32A: 4242; February 1972.

Audio-tutorial instruction was found to be more effective than conventional instruction in teaching slide rule use to engineering students. [--; --; college]

Holoien, Martin Olaf. Calculus and Computing: A Comparative Study of the Effectiveness of Computer Programming as an Aid in Learning Selected Concepts in First-Year Calculus. (University of Minnesota, 1970.) Dis. Abst. Int. 31A: 4490; March 1971.

The computer seemed helpful in learning calculus, especially for lower-ability students. [e; 59 students; college]

Hood, Duane. A Study of Selected Factors Related to Achievement in Applied and Abstract Mathematics for College Juniors and Seniors. (East Texas State University, 1971.) Dis. Abst. Int. 32A: 4985-4986; March 1972.

Predictive factors accounting for only 53 per cent of the variance were determined. [r; 96 students; 15, 16]

Horton, Robert Eugene. Concept Formation in Freshman Mathematics for Engineers. (University of Southern California, 1959.) Dis. Abst. 20: 1690; November 1959.

Hoshauer, John C. The Effect of the Number and Type of Mathematics Courses Pursued in High School Upon Adequate Mastery of or Competence in the Fundamental Mathematical Processes. PSU 10: 171-178; 1947.

Houston, William Robert. Selected Methods of In-Service Education and the Mathematics Achievement and Interest of Elementary School Pupils. (University of Texas, 1961.) Dis. Abst. 23: 157; July 1962.

Howe, Parshall Lyndon. A Study of the Effectiveness of the Curricula of the California State Colleges as a Pre-Service Preparation to Teach Algebra I and Geometry. (Oklahoma State University, 1966.) Dis. Abst. 27A: 4154-4155; June 1967.

Howlett, John L. A Study of Predicting Achievement in Analytic Geometry and Calculus. (Austin Peay State College, 1966.)

Hunkler, Richard Fredric. Achievement of Sixth-Grade Pupils in Modern Mathematics as Related to Their Teachers' Mathematics Preparation. (Texas A & M University, 1968.) Dis. Abst. 29A: 3897-3898; May 1969.

Hunt, Donald Ray. An Analysis of the Academic Background Characteristics of Selected College Calculus Students at Mississippi State University. (Mississippi State University, 1972.) Dis. Abst. Int. 33A: 3157-3158; January 1973.

Characteristics on which calculus students were superior to algebra-trigonometry or elementary functions students were reported. [r; 183 students; college]

Hunter, Louise S. Pre-Freshman Mathematics in State Colleges and Universities. (University of Virginia, 1953.) Dis. Abst. 14: 1051-1052; July 1954.

Hunyatd, Robert John. An Experimental Study in Arithmetic and Its Contributions to the Research Department of the College of Education, Thailand. (Indiana University, 1959.) Dis. Abst. 20: 3205-3206; February 1960.

Hurd, Raymond Wilbur. Use of Finite Mathematical Systems in Teaching Mathematics for Elementary Teachers. (The Ohio State University, 1967.) Dis. Abst. 28A: 4935; June 1968.

Hurst, Doyle. The Relationship Between Certain Teacher Related Variables and Student Achievement in Third Grade Arithmetic. (Oklahoma State University, 1967.) Dis. Abst. 28A: 4935-4936; June 1968.

Hytche, William Percy. A Comparative Analysis of Four Methods of Instruction in Mathematics. (Oklahoma State University, 1969.) Dis. Abst. Int. 31A: 4006; February 1971.

No significant differences were found between students having lectures with programs, discussion, textbook, or quizzes. [e; 290 students; elementary pre-service]

Ibrahim, Aaia Tawfik. A Computer-Assiated Instruction Program for Teaching the Concepts of Limits in Freshman Calculus (A Comparative Study). (State University of New York at Buffalo, 1970.) Dis. Abst. Int. 31A: 1689; October 1970.

Students who were taught partially by computer assiated instruction achieved significantly more than non-CAI students on an immediate test, but were not significantly different on a retention test. Attitudes toward CAI were generally favorable. [e; 80 students; 13]

Ikard, Thomas Emmett. Summability Methods, Sequence Spaces and Applications. (Oklahoma State University, 1970.) Dis. Abst. Int. 31B: 6750; May 1971.

Functional analysis appeared to be more feasible than use of rigorous proofs. [d; --; college]

Irby, Bobby Newell. A Follow-Up Study of the Participants of the National Science Foundation Academic Year Institutes for High School Teachers of Science and Mathematics Held at the University of Mississippi, 1961-66. (The University of Mississippi, 1967.) Dis. Abst. 28A: 2120; December 1967.

Isaac, Stephen William. Patterns of Aptitude, Motivation, and Achievement in Mathematics Students. (The Claremont Graduate School, 1963.) Dis. Abst. 24: 2573-2574; December 1963.

Jackson, Roderick Earle. The Attitudes of Disadvantaged Students Toward Mathematics. (Indiana University, 1973.) Dis. Abst. Int. 34A: 3690; January 1974.

A significant positive correlation was found between the attitudes of disadvantaged students and achievement in a basic mathematics course. [r; --; 13]

Jansson, Lars Crispin. The Development of an Instrument to Assess critical Thinking Ability in Mathematics. (Temple University, 1970.) Dis. Abst. Int. 32A: 1383; September 1971.

The 50-item test was found to have "satisfactoty" reliability and validity. [r; 258 students; elementary and secondary pre-service, college, 12]

Jedlicka, Anne. The Identification and Classification of Mistakes in Learning to Use Set Language. (University of Pittsburgh, 1972.) Dis. Abst. Int. 33A: 4679; March 1973.

The intersection mistake was found to occur most frequently; other mistakes were identified and suggestions made for correcting them. [s; --; college]

Jensen, Ove William. The Development and Standardization of a Test of Understandings of the Real Number System. (University of Miami, 1967.) Dis. Abst. 28A: 988; September 1967.

Jensen, Rosalie Seymour. The Development and Testing of a Computer Assisted Instructional Unit Designed to Teach Deductive Reasoning. (The Florida State University, 1966.) Dis. Abst. 27A: 2280; February 1967.

Jick, Helen. A Comparative Study of the Relative Effectiveness of Two Different Freshman Mathematics Courses. (Columbia University, 1969.) Dis. Abst. Int. 30B: 1242; September 1969.

Johnson, Emma Cecelia. An Analysis of Mathematical Competencies Necessary for Certain Health Occupations. (Washington State University, 1972.) Dis. Abst. Int. 33A: 2833; December 1972.

Competencies for medical technicians were determined and a mathematics curriculum suggested. [s; 63 adults; adult]

Johnson, Richard Stanton. The Business Mathematics Competencies Needed by Career Business Students in Two-Year Colleges. (State University of New York at Albany, 1973.) Dis. Abst. Int. 34B: 4507-4508; March 1974.

Graduates reported that they had most of the mathematics competencies on a developed list. [s; --; junior college]

Johnson, Stephen Dorwald. The Role of the Situational Importance of and Uncertainty About One's Attitude Toward Mathematics on Interpersonal Attraction and Situational Open-and-Closed Mindedness. (University of Minnesota, 1971.) Dis. Abst. Int. 32A: 4421-4422; February 1972.

Students tended to like those who had attitudes toward mathematics similar to their own, and dislike those with dissimilar attitudes. [e; --; college]

Johnson, Wendell Gilbert. A Relation Between High-School and College Mathematics Grades. (Syracuse University, 1956.) Dis. Abst. 16: 1913-1914; October 1956.

Johnsten, Thomas Duane. A Study of Achievement in General College Biology at the University of Nebraska as Related to High School Backgrounds in Science and Mathematics. (The University of Nebraska Teachers College, 1967.) Dis. Abst. 28A: 1989; December 1967.

Jolley, Paul Wiseman. A Method of Evaluating an Objective of an NSF-AYI: The Effect of the 1969-1970 Florida State University Academic Year Institute Upon Its Participant's Ability to Read Pertinent Mathematical Materials. (The Florida State University, 1971.) Dis. Abst. Int. 32A: 6270; May 1972.

Ability to read mathematical materials improved during the institute. [f; 15 teachers; secondary in-service]

Jones, Franklin McGehee. A Controlled Comparison of the Academic Performance of Native and Transfer Students at the University of Georgia. (University of Georgia, 1966.) Dis. Abst. 27A: 3227; April 1967.

Jones, George Lucas. A Study to Determine Which Basic Mathematical Concepts Commonly Presented in Grades IV Through VIII Are Least Understood by Certain Elementary Majors. (Colorado State College, 1962.) Dis. Abst. 23: 3799-3800; April 1963.

Jones, John Arthur. An Intensive Investigation and Analysis of Means for Improving the Mathematics Programs in the Colleges and Universities of the United States with Predominantly Negro Student Bodies. (The Pennsylvania State University, 1965.) Dis. Abst. 27B: 881-882; September 1966.

Jones, John Howard. The Effects of Entering Achievement Level and Time Spent in Course Completion on Final Examination Performance in a Remedial Algebra Course for University Students. (Michigan State University, 1971.) Dis. Abst. Int. 32A: 3114-3115; December 1971.

No significant difference was found between groups spending six or ten weeks in the course, but entering achievement level did have an effect. [e; 2 groups; college]

Jones, Rufus Coons. A Study of the Effects of Positive and Negative Instances on the Attainment of Three Simple Conjunctive Concepts in a Mathematical Setting. (University of Maryland, 1972.) Dis. Abst. Int. 33A: 2238; November 1972.

Use of both positive and negative instances appeared to be as effective as only positive instances. [e; 76 students; community college]

Jones, Wilburn Clay. A Study of the Effects of Relating Topics in a Course of Mathematics for Elementary Teachers to Topics of an Elementary School Mathematics Textbook. (George Peabody College for Teachers, 1973.) Dis. Abst. Int. 34A: 4060; January 1974.

No significant differences in mathematical achievement or attitude were found between groups using an elementary-school textbook, exercises from that textbook, or regular instruction. [e; 76 students; elementary pre-service]

Jorgensen, Harold Christen. Characteristics of Teachers Submitting Applications for Academic Year Institute Programs at Oregon State University. (Oregon State University, 1966.) Dis. Abst. 27A: 2425; February 1967.

Joyner, Virginia Green. The Development and Evaluation of a Routine Using a Diagnostic Pretest, Individualized Assignments and Diene Blocks for the Instruction of Elementary Education Majors in CUPM Level 1 Mathematics. (The Florida State University, 1973.) Dis. Abst. Int. 34A: 6500; April 1974.

The developed approach was as effective as the traditional approach. [e; 53 students; elementary pre-service]

Judd, William Boyd. A Proposed Sophomore-Level Experimental Course in Geometric Algebra Based Primarily on the Work of Emil Artin. (The Pennsylvania State University, 1969.) Dis. Abst. Int. 31B: 802; August 1970.

The course blending modern algebra and geometry was developed for sophomores; it was very effective in a trial with graduate students. [d; --; 14]

Kalish, Aida. Training in Mathematics Appropriate for the Field of Operations Research. (Columbia University, 1973.) Dis. Abst. Int. 34B: 3920; February 1974.

From textbooks used in courses and from journal articles, prerequisite courses were determined: advanced calculus, linear algebra, probability and statistics, and differential equations. [d; --; college]

Kane, Michael Timothy. Variability in the Proof Behavior of College Students in a CAI Course in Logic as a Function of Problem Characteristics. (Stanford University, 1972.) Dis. Abst. Int. 33A: 4175; February 1973.

Student proofs were analyzed; it was found that significant variability depends on the number and type of rules available to the student. [s; 23 students; college]

Karantinos, Andrew E. A Study of Group and Individual Differences in Calculus Achievement Under Different Homework Treatments. (University of South Dakota, 1973.) Dis. Abst. Int. 34A: 2271-2272; November 1973.

Homework appeared to affect calculus achievement; characteristics of learners were identified. [e; 2 classes; college]

Karnes, H. T. Professional Preparation of Teachers of Secondary Mathematics. (George Peabody College for Teachers, 1940.)

Kaufman, Arthur. The Effectiveness of Coordinating Subject Matter of a Course in Technical Mathematics with a Related Technical Area. (New York University, 1961.) Dis. Abst. 22: 4293-4294; June 1962.

Kaufman, David M. A Study of Computer-Assisted Instructional Strategies and Learner Characteristics. (The University of British Columbia, 1973.) Dis. Abst. Int. 34A: 7586-7587; June 1974.

No significant differences were found between programs using three types of feedback. A significant difference in the proportion of errors was found between the response-insensitive and the no-correctional feedback groups. [e; 63 students; elementary preservice]

Keith, Virgie Irene. Elementary Teachers' Knowledge of the Geometry Appearing in Elementary School Mathematics Textbooks. (University of Virginia, 1970.) Dis. Abst. Int. 31A: 5037; April 1971.

Virginia teachers were found to have a better knowledge of the geometry in elementary school textbooks than with the geometry recommended by CUPM, SMSG, and CEEB, but they are weak in at least ten areas. [s; 199 teachers; elementary in-service]

Kellems, Robert Leo. A Comparative Analysis of the Effect of the Use of a Programmed Text on Achievement and Efficiency in College Algebra. (Indiana University, 1964.) Dis. Abst. 25: 4577-4578; February 1965.

Kelley, Roscoe Douglas. An Analysis of Two Mathematics Workshops for Teachers and Outcomes as Reflected in Participating Schools. (Alabama Polytechnic Institute, 1958.) Dis. Abst. 19: 1305-1306; December 1958.

Kellogg, Howard Morgan. Task Format and the Deep-End Hypothesis in the Learning of Mathematical Group Structures. (Columbia University, 1973.) Dis. Abst. Int. 34A: 5802; March 1974.

No evidence was found of a "deep-end effect" (in which learning is greater than when "shallow-end" tasks are presented). Performance was better when free-choice format tasks were compared with state-operator-state format tasks. [e; 144 students; college, graduate students]

Kerce, Robert Hughes. A Study of the Interaction Between Class Size and Teaching Method in Freshman College Mathematics Instruction. (George Peabody College for Teachers, 1965.) Dis. Abst. 26: 6742; May 1966.

Kersh, B. Y. Variations in Number Symbols and Instruction Procedures in Learning Numerical Concepts. (University of California, 1955.)

Key, James Frazier. An Investigation in the Teaching of Quadratic Equations Using Programed Instruction. (George Peabody College for Teachers, 1964.) Dis. Abst. 25: 6435; May 1965.

Kidd, Alice Reese. The Development of an Instructional Package for High School Geometry Teachers and a Study of the Effectiveness of Its Use in In-Service Training. (The University of Texas at Austin, 1970.) Dis. Abst. Int. 32A: 3561; January 1972.

The developed in-service materials appeared to be effective in preparing teachers to teach a new geometry course. [e; 39 teachers; secondary in-service]

Kimes, Barbara Ann. A Comparison of Selected Characteristics of Developmental Mathematics Students at Eastfield College. (East Texas State University, 1973.) Dis. Abst. Int. 34A: 5483-5484; March 1974.

Students who completed the course had significantly higher IQ and self-concept scores, and were older than non-completing students. [s; 185 students; college]

Kindle, E. Glenn. Evaluation of the 1969 Colorado Department of Education In-Service Program for Elementary School Mathematics Teachers. (University of Denver, 1971.) Dis. Abst. Int. 32B: 7172; June 1972.

Teachers gained in content achievement and implemented materials, concepts, and techniques from the in-service program. [a; 403 teachers; elementary in-service]

Kindschi, Paul Douglas. Studies in Differential Aptitude as Related to Mathematics Learning. (The University of Wisconsin, 1972.) Dis. Abst. Int. 33B: 2703; December 1972.

A predictive equation, student characteristics, and a course based on mastery learning were determined. Learning rate was predicted by quantitative aptitude. [r, a; 1 class; 13]

King, Calvin Elijah. A Comparative Study of the Effectiveness of Teaching a Course in Remedial Mathematics to College Students by Television and by the Conventional Method. (The Ohio State University, 1959.) Dis. Abst. 20: 2177; December 1959.

King, Estelle Marie Holloway. Open Learning and Lecture Methods of Teaching College Mathematics. (University of Pittsburgh, 1972.) Dis. Abst. Int. 33A: 4122-4123; February 1973.

The open learning approach was found to be at least as effective as the lecture approach. [e; 92 students (4 classes); college]

King, Robert William. An Investigation of the Effects of Group Interaction on Learning Mathematics Using a Programed Text Developed Under a Broadened Concept of Programed Instruction. (The Florida State University, 1967.) Dis. Abst. 28A: 1004; September 1967.

Kinsey, David Webster. An Analysis of College Students' Understandings of Function. (Indiana University, 1972.) Dis. Abst. Int. 33A: 2239; November 1972.

Non-algebraic aspects of functions were understood better than algebraic ones, and more readily identified and used. [s; 132 students; college]

Kipps, Carol Herdina. Basic Arithmetic Offered in California Public Junior Colleges. (University of California, Los Angeles, 1966.) Dis. Abst. 27B: 2032; December 1966.

Kirby, William Abbott. A Critical Analysis of Certain Collegiate Mathematics Programs in Texas, Oklahoma, and Arkansas. (The University of Texas, 1963.) Dis. Abst. 24: 5086; June 1964.

Klement, Jerome Joseph. The Effects of Three Reinforcement Schedules and Two Media in Presenting Computer Assisted Instruction to Under-Educated Adults. (North Carolina State University at Raleigh, 1971.) Dis. Abst. Int. 32A: 1830-1831; October 1971.

No significant differences were found between visual and audiovisual modes or between three types of reinforcement, for five mathematics lessons. [s; 36 students; adult]

Klinger, William Russell. Effect of Distribution of Earlier Concepts as Preliminary Homework Exercises Upon Achievement in a Remedial Mathematics Course at the College Level. (The Ohio State University, 1973.) Dis. Abst. Int. 34A: 4567-4568; February 1974.

Achievement differences fevored the distributed-practice group over the massed-practice group. [e; 40 classes (809 students); college]

Knight, Lyman Coleman, Jr. A Study of the Effectiveness of the Subject Matter of Modern Mathematics in the Preparation of Elementary School Teachers. (University of Pittsburgh, 1958.) Dis. Abst. 19: 1299; December 1958.

Knights, Frances Ellura. The Development of an Instrument to Predict Success in Analytic Geometry of Entering College Freshmen in Engineering and the Indication of Some Possible Improvements Advisable in Their Secondary School Mathematics Courses. (The Pennsylvania State University, 1957.) Dis. Abst. 18: 120-121; January 1958.

Knodel, Raymond Willard. A Comparative Study of Two Approaches to Teaching Mathematics and Arithmetic Methods to Prospective Elementary School Teachers. (University of Northern Colorado, 1970.) Dis. Abst. Int. 31A: 4010-4011; Februaty 1971.

The course in which methods and content were integrated was found to be more effective than separate courses. [e; 65 students; elementary pre-service]

Koch, Dale Roy. Concept of Self and Mathematics Achievement. (Auburn University, 1972.) Dis. Abst. Int. 33A: 1081; September 1972.

A significant relationship was found between student self-concept and achievement. No significant effect of teacher self-concept level on student achievement was found, and teacher content-competence had little effect on student achievement. [s; 602 pupils, 26 teachers; 6, teachers]

Kockler, Lois Haase. Using Computer Assisted Instruction in Overcoming Attitude Barriers. (Iowa State University, 1972.) Dis. Abst. Int. 33A: 5519; April 1973.

Attitude toward CAI improved in the computer-assisted group, but no differences in achievement or attitude toward mathematics were found between the CAI and lecture-only groups. [e; 64 students; college]

Koeckeritz, William Albert. An Analysis of Mathematical and Professional Knowledge of Present and Future Elementary Teachers. (Utah State University, 1970.) Dis. Abst. Int. 31A: 3172; January 1971.

Professional knowledge of in-service teachers and college seniors was significantly higher than that of college freshmen. Mathematical concepts were not significantly different among these groups and high school sophomores. [s; 153 teachers, 325 college students, 147 secondary teachers; elementary pre- and in-service]

Koehler, Truman Lester. The Selection of Certain Significant Concepts in College Algebra and the Determination of Their Degree of Emphesis in Some Widely Adopted Texts. (University of Pennsylvania, 1952.) Dis. Abst. 12: 842-843; Issue 6, 1952.

Kollin, Robert. A Study of the Effects of High School Mathematics on the Academic and Job Achievements of Selected Community College Technical Program Graduates. (Wayne State University, 1971.) Dis. Abst. Int. 32A: 2568; November 1971.

Differences in achievement and needs were analysed. [s; 68 graduates; community college]

Konkle, Gail Stuart. Achievement as Affected by Teaching for Generalization in Mathematics. (Arizona State University, 1968.) Dis. Abst. 29A: 2588; February 1969.

Kontogianes, John T. The Effects on Achievement, Retention, and Attitude of an Individualized Instructional Program in Mathematics for Prospective Elementary School Teachers. (The University of Oklahoma, 1973.) Dis. Abst. Int. 34A: 5802; March 1974.

Students using the individualized program achieved and retained significantly higher scores than those having the regular program. [e; --; elementary pre-service]

Korb, Roslyn Abravaya. A Study of Aptitudes, Cognitive Styles, and Personality Characteristics as Facilitators and Differentiators of Creativity in Four Distinct Disciplines. (University of Houston, 1973.) Dis. Abst. Int. 34B: 5655-5656; May 1974.

Different variables predicted creativity in mathematics and three other fields. [r; 146 students (21 in mathematics); college]

Koren, Charles. A Program for the Preparation of Teachers of Mathematics in Community Colleges. (Teachers College, Columbia University, 1952.)

Kornegay, William Francis. The Status of Mathematics Teaching in Illinois Public Junior Colleges for 1969-1970. (University of Illinois at Urbana-Champaign, 1971.) Dis. Abst. Int. 32A: 1297-1298; September 1971.

Characteristics, work load, and preparation of junior college teachers were determined, and compared with other junior college data. [s; --; junior college]

Kozak, Andrew V. Kalgometrics: An Experiment in the Teaching of Plane Geometry, Trigonometry, Analytic Geometry, Differential Calculus, and Integral Calculus to "Selected" Tenth-Grade Pupils in the High School. PSU 15: 340-349; 1952.

Kuehls, Ernest Albert. Effect of Interspersed Questions on Learning From Mathematical Text. (The University of Akron, 1971.) Dis. Abst. Int. 32A: 3865; January 1972.

Interspersing skill-type questions was found to have no effect on achievement. [e; 60 students; college]

Laffin, Charles Wesley, Jr. Preparation of Mathematics Teachers for Public Two-Year Colleges in New York State: A Study of Selected Factors in the Educational Programs of Public Two-Year Colleges in New York State That Relate to the Pre-Service Preparation of Mathematics Teachers for These Colleges. (New York University, 1959.) Dis. Abst. 20: 4341; May 1960.

LaGrone, Cyrus Wilson. A Syllabus of Mathematics 370, the Teaching of Arithmetic, Grades 4 to 7 Inclusive: A Course in East Texas State Teachers College, Designed to Prepare Teachers of Elementary Education. (New York University, 1937.)

Lampela, Roland Mitchell. An Investigation of the Relationship Between Teacher Understanding and Change in Pupil Understanding of Selected Concepts in Elementary School Mathematics. (University of California, Los Angeles, 1966.) Dis. Abst. 27A: 1548-1549; December 1966.

Landis, William Harper. Secondary Students' Mathematics Competencies in Relation to Employment Tests. (University of Southern California, 1968.) Dis. Abst. 28A: 4051-4052; April 1968.

Lane, Bennie Ray. An Experiment with Programed Instruction as a Supplement to Teaching College Mathematics by Closed-Circuit Television. (George Peabody College for Teachers, 1962.) Dis. Abst. 23: 3817-3818; April 1963.

Lang, Martin Traugott. Computer Extended Instruction in Introductory Calculus. (The University of Texas at Austin, 1973.) Dis. Abst. Int. 34A: 5662; March 1974.

The computer group achieved higher scores on a concepts test than the non-computer group; no difference was found on a general test. [e; 8 classes; college]

Larsen, Charles McLoud. The Heuristic Standpoint in the Teaching of Elementary Calculus. (Stanford University, 1960.) Dis. Abst. 21: 2632-2633; March 1961.

Larsen, Leland Malvern. A Study of the Relative Competencies of Students in an Integrated Analytic Geometry-Calculus Program as Compared with Students in a Sequential Program. (The University of Nebraska, 1967.) Dis. Abst. 28A: 396-397; August 1967.

Larson, Graham John. A Study of the Relative Effects of Patterns of Repetition on the Learning and Retention of the Limit Concept in a College Mathematics Course. (The Ohio State University, 1972.) Dis. Abst. Int. 33A: 1591; October 1972.

No significant differences in achievement were found between groups having spaced or integrated repetition with or without variety. [e; 9 classes; college]

Larson, Ronald Allen. A Study to Determine the Feasibility of Using a Cognitive Preference Test as a Predictor of Major Field of Study. (State University of New York at Buffalo, 1972.) Dis. Abst. Int. 33A: 1039; September 1972.

The preference test was found to make overall distinctions between groups. [r; 254 students; elementary and secondary pre-service]

Lashley, Gerald Ernest. An Application of Programmed Instruction to an Introduction to the Theory of the Riemann Integral with Consideration to the Mode of Response. (Boston University School of Education, 1969.) Dis. Abst. Int. 31A: 298; July 1970.

The linear constructed-response program was as effective as the lecture method, and effected higher achievement than the reading-response program. [e; 285 students; college]

Laughlin, James Stanley. An Opinion Survey and Analysis of General Education Mathematics in Twelve Selected Colleges. (University of Denver, 1968.) Dis. Abst. 29A: 3407; April 1969.

Lawrence, Simon Joseph. The Effectiveness of a Programmed Sequence of Projectuals in the Teaching of Mathematics to College Freshmen. (New York University, 1966.) Dis. Abst. 27A: 3777-3778; May 1967.

Lawrisuk, Paul I. Evaluating the Effectiveness of an Auto-Instructional Method in the Teaching of Mathematics in a Community College. (Loyola University of Chicago, 1973.) Dis. Abst. Int. 34A: 3089; December 1973.

No significant differences in achievement or attrition were found between audio-tutorial and lecture-discussion approaches. [e; 225 students; community college]

Lazar, David I. The Development and Validation of an Instrument to Assess the Understanding of Basic Algebraic Concepts by Prospective Teachers of Secondary School Mathematics. (Temple University, 1972.) Dis. Abst. Int. 33A: 1517; October 1972.

The developed 35-item test was found to be reliable and valid. [a; 170 atudents; aecondary pre-service]

Lazorack, Metro. Diagnoatic Pretesting and Remediation for Calculus Students in Blue Ridge Community College. (Univeraity of Virginia, 1973.) Dia. Abat. Int. 34A: 4086; January 1974.

Uae of a diagnoatic teat and remedial instruction wae reported to be auccesaful. [a; 10 atudents; community college]

Leach, Margaret Pihlblad. Context Evaluation of Mathematical Analyeis I at the University of Tulaa. (The University of Tulaa, 1973.) Dia. Abat. Int. 34A: 1063; September 1973.

Goals of instructors and cognitive needa of learnera were analyzed. [s; --; college]

Leach, Mary Louise Moynihan. Primacy Effecta Aaaociated with Long Term Retention of Mathematical Algorithms. (University of Maryland, 1973.) Dia. Abat. Int. 34A: 7002-7003; May 1974.

No aignificant differencea in retention were found for any ordering of algorithmic sequences. [e; 60 atudenta; elementary pre-aervice]

Leake, Charles R. Intereat Changea in Mathematica of Selected College Studenta in New York State. (New York University, 1969.) Dia. Abat. Int. 30A: 2853; January 1970.

Significant relationahipa were found between change in intereat and claea, courae, text, instructor, and college. Elementary education majora showed a gain in interest, not found in other major areas of atudy. [a; 929 atudents; college]

Learn, George Arthur, Jr. A Study of the Effect Upon Conceptual Attainment of the Uee of Computations and Numerical Problem Solving in the Teaching of College Phyaical Science. (Rutgers Univeraity, The State University of New Jeraey, 1974.) Dia. Abat. Int. 35A: 3543; December 1974.

Higher mean acorea were achieved when a non-computational approach was used. [e; --; college]

Leary, Arthur Vincent. An Instructional Strategy for Underachievera. (The University of Oklahoma, 1973.) Dia. Abat. Int. 34B: 2781; December 1973.

A courae allowing aelf-pacing was developed. [a; --; college]

Leasman, Rudolf Eugene. The Relation of the Pattern of High School Courses to College Success. (University of Illinois, 1954.) Dis. Abst. 15: 70-71; January 1955.

Ledoux, Clarence Eugene. A Study of Mathematical Skills Needed for Entry-Level Employment in a Cluster of Electricity-Electronics Occupations. (Oregon State University, 1974.) Dis. Abst. Int. 34A: 4105; January 1974.

An inventory of validated mathematical skills needed by electricity-electronic technicians was developed. [s; 60 adults; adult]

Lee, Paul Christian Young. A Study of Teaching the Elements of Analytic Geometry in the Lower Division of American Colleges. (Columbia University, 1964.) Dis. Abst. 25: 5300; March 1965.

Lefkowitz, Ruth Samson. A Study of the Advanced Placement Program in Mathematics at a Large New York City Public High School. (Columbia University, 1966.) Dis. Abst. 27B: 4025; May 1967.

Lefstad, Dana Julian. An Analysis of the Junior College Program in Mathematics for General Education. (Washington State University, 1963.) Dis. Abst. 24: 1097; September 1963.

Leggette, Earl Charles. The Effect of a Structured Problem-Solving Process on the Problem-Solving Ability of Capable But Poorly Prepared College Freshmen in Mathematics. (Rutgers University, The State University of New Jersey, 1973.) Dis. Abst. Int. 34A: 3838; January 1974.

Use of the problem-solving heuristics approach resulted in higher achievement and attitude scores. [e; 70 students (4 groups); 13 (junior college)]

Leitch, Vernon Dale. A Comparative Study of the Active Learning Approach and the Lecture Discussion Method of Instruction for Prospective Elementary Teachers. (University of Northern Colorado, 1972.) Dis. Abst. Int. 33A: 3464; January 1973.

The activity-oriented approach resulted in significantly greater achievement and a more positive attitude toward mathematics than the lecture-discussion method did. [e; 57 students; elementary pre-service]

Leonard, William A. The Development and Appraisal of a Unit on Simple Continued Fractions for Prospective Elementary School Teachers. (University of Northern Colorado, 1972.) Dis. Abst. Int. 33B: 5394-5395; May 1973.

Achievement on the developed unit was satisfactory and attitudes were positive. [a; 36 students; elementary pre-service]

Leonhardy, Adele. The Mathematics Used in the Humanities, Social Science, and Natural Science Areas in a Program of General Education on the College Level. (University of Missouri, 1950.) Dis. Abst. 10: 72-74; Issue 3, 1950.

Lepich, James Franklin. The Relationship Between Arithmetic Skills and Employment for Graduates of Work Study and Non-Work Study Programs for the Mentally Retarded. (University of Northern Colorado, 1971.) Dis. Abst. Int. 32A: 1944-1945; October 1971.

Work-study programs did not affect arithmetic skills. Employed men had better arithmetic skills than unemployed men did. [f; 40 men; adults (MRs)]

Levine, Joan Lobel. A Comparative Study of Two Methods of Teaching Mathematical Analysis at the College Level. (Columbia University, 1967.) Dis. Abst. 28A: 4052; April 1968.

Levine, Maita Faye. A Study of Mathematical Confidence Relative to the Attainment of Certain Objectives of the In-Service Institute in Mathematics for Secondary School Teachers, University of Cincinnati, 1969-1970. (The Ohio State University, 1970.) Dis. Abst. Int. 32A: 287-288; July 1971.

Mathematical "confidence" and competence of participants in the in-service institute significantly increased. [a; 53 teachers; secondary in-service]

Lightner, James Edward. The Effect of the Recommendations of the Committee on the Undergraduate Program in Mathematics Upon the Mathematics Curricula of the Colleges of Maryland. (The Ohio State University, 1968.) Dis. Abst. 29A: 1478; November 1968.

Liguori, Ralph Anthony. A Controlled Study of P.S.I. Procedures Applied to a College Business Mathematics Course. (The University of New Mexico, 1973.) Dis. Abst. Int. 35A: 1551-1552; September 1974.

No significant difference in achievement was found between groups using personalized or regular procedures. [e; 4 sections; college]

Lindell, Verlyn LeRoy. An Evaluation of an In-Service Program for Elementary School Mathematics Teachers Conducted by the Colorado State Department of Education. (University of Denver, 1966.) Dis. Abst. 27A: 3346; April 1967.

Lindsay, Charles McCown. An Experimental Investigation of Two Methods Used in the In-Service Education of Teachers of Arithmetic. (George Peabody College for Teachers, 1965.) Dis. Abst. 26: 5219-5220; March 1966.

Lindstrom, Peter A. The Presentation of Basic Concepts of the Elementary Transcendental Functions in the Calculus. (State University of New York at Buffalo, 1972.) Dis. Abst. Int. 33B: 1193; September 1972.

Three approaches to functions were determined and discussed. [d; —; college]

Linacheid, Harold Wilbert. A Study of the Freshman Mathematics Placement Program at the University of Oklahoma. (The Univeraity of Oklahoma, 1955.) Dis. Abst. 16: 52-53; January 1956.

Lipsey, Sally Irene. A Programmed Course in Mathematics for Nursing Students. (Columbia University, 1965.) Dis. Abst. 26: 4693; February 1966.

Lipson, Stanley Harris. The Effects of Teaching Heuristics to Student Teachers in Mathematics. (Columbia University, 1972.) Dis. Abst. Int. 33A: 2221-2222; November 1972.

Instruction on heuristics had some effect on problem-solving scores, and appeared to result in more use of heuristics in teaching. [e; 43 students; secondary pre-service]

Little, Charles Edward. An Experimental Study of Programed Instruction in College Algebra at Colorado State College. (Research Study No. 1). (Colorado State College, 1964.) Dis. Abst. 25: 5154; March 1965.

Little, Richard A. A Taxonomic Approach to Measuring Achievement in Mathematics 223 - Geometry for Elementary Teachers. (Kent State University, 1971.) Dis. Abst. Int. 32A: 6105; May 1972.

Four of six levels of the hierarchy on Bloom's Taxonomy were supported by the test. [r; 62 students; elementary pre-service]

Littrell, John Harvey. Mathematics Needed for the In-School Experience of Students in Selected Semi-Professional Curricula. (University of Missouri, 1950.) Dis. Abst. 10: 48-50; Issue 2, 1950.

Litwiller, Bonnie Helen. Enrichment: A Method of Changing the Attitudes of Prospective Elementary Teachers Toward Mathematics. (Indiana University, 1968.) Dis. Abst. 29A: 1808-1809; December 1968.

Logothetti, David Eugene. Development and Implementation of the Poincare-Hadamard Conception of Mathematical Problem Solving. (University of California, Los Angeles, 1972.) Dis. Abst. Int. 33A: 5475; April 1973.

The problem-solving theory was analyzed, and specific recommendations and behaviors determined. [d; —; college]

Lohela, Arvo Ephraim. Enrollment Characteristics and Teacher Preparation in Michigan Secondary School Mathematics. (University of Michigan, 1958.) Dis. Abst. 19: 471-472; September 1958.

Lomax, P. S. A Comparative Study of Commercial English, Mathematics, and Science Teachers in the State of New Jersey. (New York University, 1927.)

Long, Harvey Shenk. A Determination of the Relation of the Total Time for Course Completion to the Duration of the Study Interval in Teaching Via Computer Assisted Instruction. (New York University, 1969.) Dis. Abst. Int. 30A: 2422; December 1969.

Longmire, Marshall Lee. Performance of Students in General College Chemistry as Related to Secondary School Preparation in Chemistry and Other Selected Variables: A Predictive Study. (Rutgers University, The State Univeraity of New Jersey, 1973.) Dis. Abst. Int. 34A: 4028; January 1974.

The best single predictor of college chemistry achievement was secondary-school mathematics preparation. [r; 120 students; college]

Lott, Johnny Warren. Alternatives to Traditional Secondary School Geometry and the Formation of an Informal Geometry Curriculum for Teacher Training. (Georgia State University, 1973.) Dis. Abst. Int. 34A: 4964-4965; February 1974.

No significant differences in achievement were found between teachers who studied informal geometry before or after traditional geometry. [d, e; 26 teachers; secondary in-service]

Love, Theodore Arcaola. The Relation of Achievement in Mathematics to Certain Abilities in Problem-Solving. (New York University, 1951.) Dis. Abst. 11: 960-962; Issue 4, 1951.

Love, William Pegram. Individual Versus Paired Learning of an Abstract Algebra Presented by Computer Assisted Instruction. (The Florida State University, 1969.) Dis. Abst. Int. 31A: 248; July 1970.

No significant differences were found between students who used a CAI program alone or in pairs. [c; 54 students; college]

Lucas, John Frank. An Exploratory Study of the Diagnostic Teaching of Heuristic Problem Solving Strategies in Calculus. (The University of Wisconsin, 1972.) Dis. Abst. Int. 32A: 6825; June 1972.

Heuristic strategies used by students were determined. Instruction using heuristic strategies was effective in changing some aspects of performance. [e; 40 students; 13]

Ludeman, Clinton John. A Comparison of Achievement in an Accelerated Program and a Standard Program of High School Mathematics in Lincoln, Nebraska, Schools. (The University of Nebraska, 1969.) Dis. Abst. Int. 31A: 299-300; July 1970.

Those in the accelerated program generally achieved significantly higher than those in the standard program, with either IQ or content level accounting for score differences. Grades in calculus were also higher for those in the accelerated program. [f; --; 12]

Lyng, Merwin John. Relation of Knowledge of Contemporary Mathematics to Other Variables for a Sample of Experienced Secondary Teachers. (The Ohio State University, 1967.) Dis. Abst. 28A: 989; September 1967.

Macey, Wade Thomas. An Investigation of the Effect of Prior Instruction of Selected Topics of Logic on the Understanding of the Limit of a Sequence. (The Florida State University, 1970.) Dis. Abst. Int. 31B: 5490; March 1971.

No significant differences were found between groups taught limits with or without instruction in logic. [e; 27 students; college]

Mach, George Robert, Jr. A Comparative Study of Student Performance in an Intermediate Calculus Class as a Result of Different Evaluation Programs. (Purdue University, 1963.) Dis. Abst. 24: 5248; June 1964.

Mader, David George. A Study of Strategies for Selection of Students for Individually Paced Sections of a College Mathematics Course. (The Ohio State University, 1971.) Dis. Abst. Int. 32A: 3667; January 1972.

The strategy which emphasised student choice of pacing plus test scores yielded the highest percentage of correct decisions. [r; 600 students; college]

Mahaffey, Michael Lee. An Experimental Comparison of Students and Teachers in Culturally Deprived and Non-Culturally Deprived Schools in a Mathematics In-Service Training Program. (Southern Illinois University, 1968.) Dis. Abst. 29A: 2589-2590; February 1969.

Malcolm, Paul Scott. Finite Trigonometry: A Resource for Teachers. (The Ohio State University, 1968.) Dis. Abst. 29A: 1367; November 1968.

Maletsky, Evan Merle. The Relative Merits of Several Methods of Teaching Probability in Elementary Statistics. (New York University, 1961.) Dis. Abst. 22: 503-504; August 1961.

Malin, Jane Ellen Tanner. An Analysis of Strategies for Solving Certain Substitution Problems. (The University of Michigan, 1973.) Dis. Abst. Int. 34B: 4089-4090; February 1974.

Grouping of variables facilitated problem solving. Models indicated that students used at least three alternative strategies. [s; —; college]

Mallory, Curtiss Orville. An Experiment Using Programed Materials to Supplement a Mathematics Content Course for Elementary Education Majors. (Coloredo State College, 1969.) Dis. Abst. Int. 30B: 1793; October 1969.

Marchand, Susan Gordan. Topics in Elementary Mathematics Using Computer-Oriented Techniques. (Rutgers University, The State University of New Jersey, 1974.) Dis. Abst. Int. 35B: 2887-2888; December 1974.

The computer-oriented techniques resulted in increased achievement. [a; 20 students; college]

Marcinowski, Mary Evelyn Brannan. Technical Mathematics for Two-Year Electronics Programs. (Auburn University, 1971.) Dis. Abst. Int. 32B: 2863; November 1971.

Materials appropriate for teaching technical mathematics for electronics were developed. [d; —; technical school]

Marcus, Stanley Tien. The Effect of Varying Incentive and Degree of Learner Control in Providing Computerized Help with Essential Mathematics Required in Chemistry (CHEMRIC). (The Ohio State University, 1973.) Dis. Abst. Int. 34B: 4249-4250; March 1974.

Among the findings was the indication that chemistry students had difficulty with problems involving several kinds of manipulations, and those involving logarithms, graphs, units, and algebraic equations. [e; 3 sections; college]

Marding, Robert Neil. The Objectives of Mathematics Education in Secondary Schools as Perceived by Various Concerned Groups. (The University of Nebraska, 1968.) Dis. Abst. 29A: 4375; June 1969.

Maricle, William O. A Follow-Up Study of an Experimental Seventh-Grade Mathematics Program. (University of Colorado, 1969.) Dis. Abst. Int. 31B: 1403-1404; September 1970.

The experimental program involving in-depth study of mathematical relationships and understandings as they pertain to the algorithms of the fundamental operations was generally successful, especially for high ability students. During the senior high school and two years of college, the experimental group pursued more mathematics courses and achieved as well as the conventionally-taught group. [e; —; 7-14]

Marsh, C. William. Maximizing Performance on a Mathematics Placement Test. (University of Cincinnati, 1972.) Dis. Abst. Int. 33A: 3426; January 1973.

Many students earned higher entry course levels when using a procedure permitting them to select test items ordered by difficulty, rather than completing the entire test. [e; 195 students; 13 (community college)]

Martau, Gerald Edward. The Development of a Model Mathematics Methods Component of an Elementary School Teacher's Preparation. (The University of Toledo, 1972.) Dis. Abst. Int. 34A: 651; August 1973.

Use of the instructional module resulted in achievement gains and changes in attitude. [a; 2 classes; elementary pre- and in-service]

Martin, Bernard Loyal. Spatial Visualization Abilities of Central Washington State College Prospective Elementary and Secondary Teachers of Mathematics. (Oregon State University, 1966.) Dis. Abst. 27A: 2427-2428; February 1967.

Martin, John Frederick, Jr. Evaluation of Elements of Analysis for Preservice Elementary Teachers. (Columbia University, 1972.) Dis. Abst. Int. 33A: 1062-1063; September 1972.

The experimental course materials appeared to be effective for students with low SAT scores, and no more effective than regular materials for those with high SAT scores. [e; 4 classes (127 students); elementary pre-service]

Martinen, Gordon David. A Study of the National Science Foundation Summer Institutes in Science and Mathematics Held at the Univeraity of Idaho From 1957 Through 1964 and Their Impact on Professional Activities of the Recipients. (University of Idaho, 1967.) Dis. Abst. 28A: 2446-2447; January 1968.

Masalski, William Joseph. The Design and Feasibility Study of the Mathematics Component of the Model Elementary Teacher Education Program. (University of Massachusetts, 1970.) Dis. Abst. Int. 31A: 2233; November 1970.

No significant differences in achievement were found between free-choice or no-choice conditions for four instructional procedures: class participation, semi-automatic audio-visual, written program, and standard textbook. Attitude was highest for those using the audio-visual mode. [e; 96 students; elementary pre-service]

Mason, Cathryn Thomas. The Effects of Counseling on Self-Concept and Academic Achievement of Disadvantaged Drop-Outs. (St. Louis University, 1972.) Dis. Abst. Int. 33A: 2718; December 1972.

Self-concept improved, but no significant differences in mathematics or other achievement scores were found between groups counseled or not counseled. [e; 40 students; adult education]

Mason, Lysle C. A Study of the Influence of Compulsory Homework on the Achievement of College Students in College Algebra. (Oklahoma State University, 1965.) Dis. Abst. 28A: 56; July 1967.

Massie, Ronald Owen. The Construction and Use of a Test to Evaluate Teacher Preparation in Modern Mathematics. (The University of Nebraska Teachers College, 1967.) Dis. Abst. 28A: 4027-4028; April 1968.

Matthews, Frank F. Measures of Creativity as These Relate to Placement in Honors Calculus. (The Ohio State University, 1974.) Dis. Abst. Int. 35A: 2543; November 1974.

Creativity measures appeared to be useful predictors for placement in advanced sections. [r; 3 groups; college]

Mazak, Ruth Marjorie Johnson. The Relationship of Selected Characteristics of Junior College Pre-Engineering Students to Their Success and Persistence in Upper-Division Professional Education for Engineering. (University of California, Los Angeles, 1967.) Dis. Abst. 28A: 470; August 1967.

Mazanec, Joseph Lewis. The Effect of Course Intensity on Academic Achievement, Student Attitudes, and Mortality Rate. (Michigan State University, 1972.) Dis. Abst. Int. 33A: 6238-6239; May 1973.

No differences in achievement were found between groups having the regular 15-week or an intensive three-week College Algebra course. For Intermediate Algebra, a six-week course was better than a 15-week course. [e; --; community, junior college]

McBride, Cecil Charles. The Effects of History of Mathematics on Attitudes Toward Mathematics of College Algebra Students. (Texas A & M University, 1974.) Dis. Abst. Int. 35A: 1963-1964; October 1974.

Use of history vignettes resulted in significantly favorable changes in attitudes. [e; 4 classes (67 students); college]

McBride, Ralph Book. Flexible Grouping and Differentiated Instruction Based on Achievement of Behavioral Objectives in a Mathematics Course for Prospective Elementary Teachers. (The University of Michigan, 1970.) Dis. Abst. Int. 31A: 4040-4041; February 1971.

The differentiated instruction plan appeared to be effective for achievement gains, anxiety reduction, and positive attitudes. [a; 88 students; elementary pre-service]

McBride, Ronald Lee. A Learning Strategy for Calculus and Analytic Geometry. (The University of Oklahoma, 1971.) Dis. Abst. Int. 32A: 5110; March 1972.

A mastery learning strategy was found to be effective. [e; 50 students; college]

McCage, Ronald Dale. A Comparison of the Use of Slides and Models to the Conventional Method of Introducing Descriptive Geometry Concepts. (Texas A & M University, 1970.) Dis. Abst. Int. 31A: 5168; April 1971.

Use of slides and models was more effective than a lecture-demonstration method. [e; 362 students; college]

McClain, Donald Henry. Development of a Computer-Assisted Instruction Unit in Probability. (Iowa State University, 1970.) Dis. Abst. Int. 31B: 5310; March 1971.

A CAI program on probability for statistics students was described. [d; 17 students; college]

McCool, Kenneth Bland. The Development and Validation of a Computer-Aided Instructional Program in Mathematics for Business and Economics Majors. (North Texas State University, 1973.) Dis. Abst. Int. 34A: 4990-4991; February 1974.

Students using the computer-aided course achieved as well in calculus as students having a regular course, and also learned programming. [e; 65 students; community college]

McCoy, Ronald Eugene. A Study of the Effects of Three Different Strategies of Proof Instruction and Background Factors of Elementary Education Majors for Success in Constructing Deductive Proof in Mathematics. (The Pennsylvania State University, 1971.) Dis. Abst. Int. 32A: 5091-5092; March 1972.

Students taught to apply logic to the construction of geometric proofs plus building models of the system and the proof achieved higher scores on a proofs test than those only taught formal or applied logic. [e; 4 classes (139 students); elementary preservice]

McCready, Richard Ralph. A Study to Determine the Value of Personnel Records of Northern State Teachers College for Predicting Success in College Business Mathematics. COSC 21: 71-73; 1959.

McDermott, Cecil Wade. Industrial Applications of Mathematical Models and Abstract Mathematical Systems for Use in Selected Graduate Mathematics Education Courses. (Auburn University, 1967.) Dis. Abst. 28A: 1331; October 1967.

McDermott, Leon Anson. A Study of Some Factors That Cause Fear and Dislike of Mathematics. (Michigan State University, 1956.) Dis. Abst. 19: 71; July 1958.

McHenry, Hugh Lansden. An Analysis of the Relative Effectiveness of Two Embodiments of Rigor in a First Course in College Mathematics for Prospective Elementary School Teachers. (George Peabody College for Teachers, 1970.) Dis. Abst. Int. 31A: 4014; February 1971.

No significant difference was found between classes taught with low-rigor or high-rigor approaches. [e; 252 students (12 classes); elementary pre-service]

McKillip, William David. The Effects of Secondary School Analytic Geometry and Calculus on Students' First Semester Calculus Grades at the University of Virginia. (University of Virginia, 1965.) Dis. Abst. 26: 5920-5921; April 1966.

McKinney, Eugene Barton. A Study of High School Honors Classes in English and Mathematics and Academic Success in College. (St. Louis University, 1968.) Dis. Abst. Int. 30A: 1369; October 1969.

McKnight, Regis Quay. Predictive Value of Selected Criteria for Success in Student Teaching. (The Pennsylvania State University, 1971.) Dis. Abst. Int. 32A: 5092-5093; March 1972.

The best predictors of student teaching grades were block course grades and content test scores. [r; --; elementary pre-service]

McLaughlin, James Joseph. The Mathematics for the Teacher of Vocational Agriculture. (Univeraity of Michigan, 1953.) Dis. Abst. 13: 342; Issue 3, 1953.

McLeod, Jeanne Annette. In-Service Training of Elementary School Teachers in Contemporary Concepts of Arithmetic. (University of Southern California, 1965.) Dis. Abst. 26: 2069-2070; October 1965.

McMahan, Ian Douglass. Causal Attributions and Expectancy of Success: Age and Sex Differences. (The City University of New York, 1972.) Dis. Abst. Int. 32B: 6689-6690; May 1972.

Females stated significantly lower expectancies than males on the addition task. Success confirming an expectancy was called ability, while performance against expectation was referred to in terms of luck and effort. [s; 349 students; 6, 10, college]

McNair, James Stuart. The Junior College Program in Mathematics. (The University of Wisconsin, 1959.) Dis. Abst. 20: 925; September 1959.

McNerney, Charles Robert. Effects of Relevancy of Content on Attitudes Toward, and Achievement in, Mathematics by Prospective Elementary School Teachers. (The Ohio State University, 1969.) Dis. Abst. Int. 30A: 2885; January 1970.

The course in which slides of children's texts were used to relate content to the classroom produced a greater positive effect on attitude and achievement than did a course taught by lectures only. [e; 430 students (2 classes); elementary pre-service]

Mein, Lillian Anne. The Difference in the Level of Anxiety for Male and Female Undergraduate Mathematics and Non-Mathematics Majors. (University of Northern Colorado, 1973.) Dis. Abst. Int. 34A: 3703; January 1974.

No differences were found in the anxiety levels of mathematics and non-mathematics majors. [r; 191 students; college]

Mendenhall, C. B. Mathematics in General Education. (The Ohio State University, 1939.)

Mermelstein, Jacob. An Investigation Concerning the Meaning of Synonyms and Antonyms of Words Denoting Time, Size and Amount for Children and Adults. (Rutgers - The State University, 1964.) Dis. Abst. 25: 3102; November 1964.

Merritt, Edith Peterson. Critical Competencies for Elementary Teachers in Selected Curriculum Areas (Arithmetic, Reading, Social Studies). (Stanford University, 1955.) Dis. Abst. 15: 377; March 1955.

Merritt, John Cutting. A Study of Selected Factors and Their Relationship to the Academic Success of College-Transfer Students at Sandhills Community College. (North Carolina State University at Raleigh, 1972.) Dis. Abst. Int. 33A: 974-975; September 1972.

High school GPA, ACT mathematics scores, and parents' annual income were the best predictors of college GPA. [r; 143 students; community college]

Merritt, Paul William. The Effects of Variations in Instruction and Final Unit Evaluation Procedures on Community College Beginning Algebra Classes. (The University of Michigan, 1972.) Dis. Abst. Int. 33A: 5978; May 1973.

A two-test final unit evaluation procedure appeared to be most effective. A whole-group approach seemed better for low-achieving students, while a grouping approach seemed better for high-achievers. [e; 161 students; community college]

Mick, Harold Warren. The Design and Production of Animated Film Loops, CAI and Pamphlets in an Individualized, Multi-Media Unit on Solving Inequalities: A Developmental Study. (The Ohio State University, 1972.) Dis. Abst. Int. 33A: 6066-6067; May 1973.

The group using pamphlets did significantly better in solving inequalities than did film or added-CAI groups. [e; 3 classes (75 students); college]

Micklich, John Robert. An Experimental Study on the Effect of Highly-Directed Versus Non-Directed Homework Assignments on Student Achievement. (The University of New Mexico, 1969.) Dis. Abst. Int. 30A: 5348; June 1970.

Students in college algebra and general mathematics did not differ significantly in achievement when taught by directed or non-directed homework procedures, though some differences on unit tests were noted under different instructors. [e; 304 students; college]

Miller, Edward Jeremiah, III. The Current Status of High School Mathematics Programs in North Central Texas as Related to Selected Factors. (North Texas State University, 1970.) Dis. Abst. Int. 31A: 3177; January 1971.

Mathematics teachers in large schools had a more extensive preparation in mathematics than did those in medium and small schools. Students from large schools scored significantly higher on an aptitude test. [s; 210 teachers (50 schools); 9-12, teachers]

Miller, Myron S. An Analysis of Clinical Cases and Non-Clinical Cases as Determined by an Arithmetic Proficiency Test. (Michigan State University, 1956.) Dis. Abst. 17: 642-643; March 1957.

Miller, Richard Hadden. A Descriptive Study of the Relationship Between Potential and Performance of Freshman Students at the University of South Dakota. (University of South Dakota, 1968.) Dis. Abst. 29A: 2612; February 1969.

Milles, Stephen Joseph. The Effect in Beginning Calculus of Homework Questions That Call for Mathematical Verbalization. (The Ohio State University, 1971.) Dis. Abst. Int. 32B: 4080; January 1972.

No significant differences were found between groups having or not having questions seeking verbalization of principles. [e; 16 sections; college]

Mino, Paschal Michael Peter. Significant Mathematics in the Education of Coal-Mine Supervisors. (Columbia University, 1953.) Dis. Abst. 14: 1349-1350; September 1954.

Mires, Kathrine Carrie. The Need for and Nature of One Type of Course in Mathematics for General Education at the College Level. (The University of Oklahoma, 1956.) Dis. Abst. 17: 1276; June 1957.

Mitchell, Merle. The Calculus Program in the Twentieth Century American College. (George Peabody College for Teachers, 1958.) Dis. Abst. 19: 2841-2842; May 1959.

Mitchell, William Montgomery. The Design of Mathematics Curricula for the Small College. (George Peabody College for Teachers, 1974.) Dis. Abst. Int. 35B: 2890; December 1974.

A survey revealed diversity in small college mathematics departments; a model to aid in developing a cohesive program was suggested. [s; 82 colleges; college]

Mobley, Jean Bellingrath. The Experimental Evaluation of the Modern Approach as Opposed to the Traditional in the Teaching of College Freshman Mathematics (on the Level of College Algebra). (University of North Carolina at Chapel Hill, 1970.) Dis. Abst. Int. 31A: 5797; May 1971.

Students who had a traditional course scored higher on achievement and opinion measures than those having a modern course. [e; 58 students; 13]

Mohr, Paul B., Sr. A Study of Negro Mathematics Facilities in Predominantly Negro Institutions. (Oklahoma State University, 1969.) Dis. Abst. Int. 31A: 4016; February 1971.

Significant relationships were found between various factors of Negro faculty members' backgrounds. [s; 181 teachers (57 colleges); college]

Moloney, James Michael. An Investigation of College Student Performance of a Logic Curriculum in a Computer-Assisted Instruction Setting. (Stanford University, 1972.) Dis. Abst. Int. 32A: 6851; June 1972.

Responses for 203 logic problems were analyzed; seven structural variables were found to be significant in predicting problem difficulty (but they accounted for only one-third of the variance). [r; 27 students; college]

Monk, Clarence. The Place of Mathematics in Modern Agricultural Education in the United States. (Columbia University, 1952.) Dis. Abst. 13: 404; Issue 3, 1953.

Monks, Herbert Victor. The Prime Number Theorem. (Oklahoma State University, 1965.) Dis. Abst. 28A: 145; July 1967.

Monroe, Harry L. A Study of the Effects of Integrating Analytic Geometry and Calculus on the Achievement of Students in These Courses. (University of Pittsburgh, 1965.) Dis. Abst. 27A: 997; October 1966.

Montano Midence, Roberto Francisco. The Effects of an Audiovisual Advance Organizer Upon the Learning of Permutations. (The University of Texas at Austin, 1974.) Dis. Abst. Int. 35A: 2547; November 1974.

No significant differences were found between groups having audiovisual, written, or no advanced organizers. [e; 51 students; college]

Montemuro, Michael Paul. A Comparative Analysis of Three Modes of Instruction Programmed Text - Audio-Projected Program and Lecture-Demonstration. (Temple University, 1968.) Dis. Abst. Int. 31A: 6312-6313; June 1971.

The programmed text and the audio-projected program were as effective as the lecture-demonstration mode. [e; —; elementary in-service]

Moody, William Braun. An Investigation of the Relationship Between Fifth Grade Student and Teacher Performance on Selected Tasks Involving Nonmetric Geometry. (University of Maryland, 1968.) Dis. Abst. 29A: 1827; December 1968.

Moon, Leland Willa, Jr. A Validity Study on a Measure of Elementary Geometric Intuition. (Indiana University, 1971.) Dis. Abst. Int. 32A: 1359; September 1971.

Geometric intuition was found to be positively correlated with mathematics achievement. [—; 4 classes; college]

Moore, Frederick Nicholson. A Comparative Study of Teaching Strategies Involving Closed-Circuit Television and Programmed Instruction. (The Ohio State University, 1969.) Dis. Abst. Int. 30A: 2912; January 1970.

The groups using television had significantly better achievement and attitude than those using programmed instruction. [e; 1630 students; 13]

Moore, Harold Ray. An Experimental Study to Compare the Relative Effects of Three Methods of Teaching Skills in the Fundamental Operations with Polynomials and Rational Expressions in College Algebra. (University of Southern Mississippi, 1973.) Dis. Abst. Int. 34A: 3919; January 1974.

No significant differences were found between groups having three types of assignments on polynomials and rational expressions. [e; 106 students; college]

Moore, Robert Ezra. The Mathematical Understanding of the Elementary School Teacher as Related to Pupil Achievement in Intermediate-Grade Arithmetic. (Stanford University, 1965.) Dis. Abst. 26: 213-214; July 1965.

Moore, Teddy R. A Comparison of Secondary Mathematics Teachers - Participants and Non-Participants - in National Science Foundation Mathematics Institutes. (Utah State University, 1971.) Dis. Abst. Int. 32A: 3843; January 1972.

Institute participants tended to use behavioral objectives more frequently and to choose "modern" courses more than non-participants did. [s; 365 teachers; secondary in-service]

Moore, Vesper Dale. The Mathematics of General Education for the Teacher. (University of Michigan, 1951.) Dis. Abst. 11: 596-597; Issue 3, 1951.

Morford, Myron Lee. A Taxonomic Approach to the Prediction of Achievement in Mathematics Education for Prospective Elementaty Teachers. (Kent State University, 1969.) Dis. Abst. Int. 30A: 4314-4315; April 1970.

Grade-point averages were the most powerful predictors of achievement on the developed taxonomy-type instrument. Not all cognitive descriptors correlated significantly with the instrument. [r; 126 students; elementary pre-service]

Morgan, Richard Thomas. The Role of the Digital Computer in a General Education Course in Mathematics. (Columbia University, 1968.) Dis. Abst. Int. 30A: 71-72; July 1969.

Morgan, William Horace. A Study of the Abilities of College Mathematics Students in Proof-Related Logic. (University of Georgia, 1971.) Dis. Abst. Int. 32B: 4081; January 1972.

Significant differences on the logic test were found favoring students from large colleges with more than 30 quarter hours of mathematics. [f; 90 students; college]

Morley, Raymond Eugene. The Relationship of Academic Achievement to Placement of Mental Retardates in Competitive Employment. (University of Missouri-Columbia, 1973.) Dis. Abst. Int. 35A: 912-913; August 1974.

Employed and unemployed retardates differed significantly in mathematics achievement. [f; 100 adults; ages 16-47]

Morman, Shelba Jean. A Comparison of an Audio-Tutorial Approach and the Traditional Lecture-Discussion Approach to the Teaching of Remedial Algebra in a Junior College Setting. (University of Houston, 1971.) Dis. Abst. Int. 32A: 5673-5674; April 1972.

No significant differences in achievement or attitude were found between groups using audio-tutorial or lecture-discussion approaches. [e; 3 groups; junior college]

Morris, James Kent. A Comparison of an Inductive and a Deductive Procedure of Teaching in a College Mathematics Course for Prospective Elementary Teachers. (North Texas State University, 1973.) Dis. Abst. Int. 35A: 308; July 1974.

Students taught by an inductive procedure achieved as well as students taught deductively. On an applications test, the deductively taught group was significantly better. [e; 2 classes; elementary pre-service]

Moulton, Linda Turner. An Analysis of Computer Utilization in Calculus Textual Materials. (Temple University, 1974.) Dis. Abst. Int. 35B: 2891; December 1974.

Among the findings was that only one-third of the colleges surveyed had even one section of calculus where the computer was used. [s; --; college]

Mulligan, Sister Rose Marian, O.S.F. The Effect of Student Constructed Assignments on Certain Factors in Mathematical Achievement and Retention. (New York University, 1959.) Dis. Abst. 20: 4402; May 1960.

Muzzey, John Adams. An Analysis of Teacher Responses Toward the University of Oregon Undergraduate Program in Mathematics for Elementary School Teachers as Perceived by Recent Graduates. (University of Oregon, 1973.) Dis. Abst. Int. 34A: 6365; April 1974.

Suggestions for improving the program, such as emphasizing evaluation, diagnosis, and remediation, are noted. [s; 610 teachers; elementary in-service]

Myers, George Glen. An Experiment in Programmed Learning in Business Mathematics at East Tennessee State University. (The University of Tennessee, 1965.) Dis, Abst, 26: 893-894; August 1965.

Myers, Roy Earl. The Relationship of the Mean Value Theorem to a Course in Elementary Calculus for the Applied Sciences. (University of Pittsburgh, 1971.) Dis. Abst. Int. 32A: 6109; May 1972.

Many objectives in calculus were found to be related to the Mean Value Theorem. [d; --; college]

Nafsiger, Mary Katherine. A Study of Selected Arithmetic Understandings of Undergraduate Students in the Elementary Teacher Preparation Program at Goshen College. (Northwestern University, 1961.) Dis. Abst. 22: 2709; February 1962.

Nair, Ralph Kenneth. Predictive Value of Standardized Tests and Inventories in Industrial Arts Teacher Education. (University of Missouri, 1950.) Dis. Abst. 10: 77-78; Issue 3, 1950.

Nappa, Klell Bayne. The Relationship of Self-Concept and Internal-External Control to the Academic Achievement of Learners in Adult Basic Education Programs. (North Carolina State University at Raleigh, 1972.) Dis. Abst. Int. 33A: 1404; October 1972.

Self-concept, intelligence, and age were found to be effective predictors of net gain in arithmetic computation. [r; 100 adults; adults (age 18+)]

Naramore, Vincent H. Cognitive Continuity: A Study of the Secondary School Teachers' Knowledge of the Field Properties of Mathematical Systems. (Syracuse University, 1968.) Dis. Abst. Int. 30A: 191-192; July 1969.

Nash, Philip Crawford. Treatment of Math Anxiety Through Systematic Desensitization and Insight-Oriented Therapy Groups. (Arizona State University, 1970.) Dis. Abst. Int. 31A: 1018-1019; September 1970.

No significant differences in attitude toward mathematics were found between groups given desensitization, insight-oriented, or no counseling. [e; 45 students; college]

Natkin, Gerald Lewis. The Treatment of Mathematical Anxiety Through Mediated Transfer of Attitude Toward Mathematics. (Indiana University, 1966.) Dis. Abst. 27A: 4137; June 1967.

Nazarian, John. A Comparative Study of the Achievement of College Students of Different Levels of Mathematical Aptitude Using Closed-Circuit Television and a Lecture-Recitation Method of Instruction. (New York University, 1967.) Dis. Abst. 28A: 1215; October 1967.

Neill, Robert Dudley. The Effects of Selected Teacher Variables on the Mathematics Achievement of Academically Talented Junior High School Pupils. (Columbia University, 1966.) Dis. Abst. 27A: 997-998; October 1966.

Nelson, Bruce Edward. The Relationship of Mathematics in Oregon High Schools to Placement and Success in First-Year Mathematics at Oregon State Univereity. (Oregon State University, 1969.) Dis. Abst. Int. 30A: 1401-1402; October 1969.

Nelson, Carl Van Cleave. The Development and Evaluation of a Matrix Algebra Unit for Educational Statistics. (Indiana University, 1972.) Dis. Abst. Int. 33A: 6736; June 1973.

Students using the developed unit achieved significantly higher scores than those using a textbook. [e; 16 students; college]

Nelson, Paul Alden. Attitudes Held by Elementary Education Teachers Toward the Developmental Potential of the Content Areas. (University of Illinois, 1968.) Dis. Abst. Int. 30A: 192; July 1969.

Nemecek, Vivian. Preparation, Problems, and Practices of Mathematics Teachers in the North Central High Schools of Oklahoma. (The University of Oklahoma, 1955.) Dis. Abst. 16: 73; January 1956.

Nietling, Lloyd Charles. Using Problems to Initiate the Study of Certain Topics in Mathematics. (The Ohio State University, 1968.) Dis. Abst. 29A: 1372; November 1968.

Niman, John. Mathematical Models of Physics for Teaching. (Columbia University, 1969.) Dis. Abst. Int. 30A: 2264; December 1969.

Nitsos, James Louis. The Influence of Introductory Experiences on the Cognitive and Affective Outcomes of Linear Programed Instruction. (University of Southern California, 1970.) Dis. Abst. Int. 31A: 4627-4628; March 1971.

A film introduction was not as effective as either a positively or a negatively oriented lecture or no introduction for a programmed lesson on binary arithmetic. [e; 128 students; college]

Nixt, Henry Charles. The Relative Effects of Frequent Use of Advance Organizers and Structured Reviews as Alternative Uses of Recitation Time in College Mathematics for Non-Physical Science Students. (The Ohio State University, 1972.) Dis. Abst. Int. 33A: 4248; February 1973.

No significant differences were found between groups having advance organizers or reviews. [e; 360 students; 13]

Noack, Horst Richard. Application of Latent Trait Models to the ACT Mathematics Usage Test. (Iowa State University, 1973.) Dis. Abst. Int. 34B: 2288; November 1973.

The Rasch model was found to be better than either the two- or three-parameter logistic model for estimating distributions. [s; 1200 students; college]

Noll, Robert Francis. Mathematics and Science Requirements for Drafting Technicians. (Arizona State University, 1967.) Dis. Abst. 28A: 1008-1009; September 1967.

Norman, Philip Brown. Relationships Between Problem-Solving Ability Computational Skill: Intelligence, and Amount of Training in Mathematics. (Columbia University, 1950.) Dis. Abst. 10: 156-157; Issue 4, 1950.

Norris, Fletcher Ragland. Pupil Achievement as a Function of an Inservice Training Program on Mathematics Concepts for Sixth Grade Teachers. (George Peabody College for Teachers, 1968.) Dis. Abst. Int. 30A: 1054; September 1969.

Northey, James Howard. The Lecture and Discussion Use of Class Time in a Pre-Service Mathematics Class for Elementary Teachers. (The University of Michigan, 1967.) Dis. Abst. 28A: 2125-2126; December 1967.

Nott, Maurice Elmer, Jr. A Comparison of Two Methods of Teaching Selected Topics in Algebra. (The Florida State University, 1970.) Dis. Abst. Int. 31A: 4495-4496; March 1971.

No significant difference was found between programmed instruction or lecture-text groups unless time was considered. [e; 12 classes; junior college]

Nugent, Paul Thomas. A Study of Selected Elementary Teachers' Attitudes Toward the New Mathematics. (University of Kentucky, 1967.) Dis. Abst. Int. 30A: 2265; December 1969.

Nuhfer, Thomas Harry. Individual Enrichment in Mathematics Utilising Three Modes of Instruction: A Comparison Involving Advanced High School and Lower Division College Students. (State University of New York at Buffalo, 1971.) Dis. Abst. Int. 32A: 2554; November 1971.

Both the linear-programmed-text group and the audio-taped program group achieved higher scores than the enrichment-textbook group. The use of audio tape also resulted in better retention. [e; 108 students; 10, 12, college]

Nunley, Bobby Gene. A Study of the Effectiveness of Tele-Lecture in the Retraining of Elementary Teachers in Mathematics. (The University of Texas, 1965.) Dis. Abst. 26: 3165; December 1965.

Nuthall, G. A. An Experimental Comparison of Instructional Strategies in the Teaching of Concepts. (University of Illinois, 1966.)

Nystrom, Norman Keith. An Experimental Study to Compare the Relative Effects of Two Methods of Instruction on Learning of Intermediate Algebra. (Arizona State University, 1969.) Dis. Abst. 29A: 3532-3533; April 1969.

O'Donnell, John Robert. Levels of Arithmetical Achievement, Attitudes Toward Arithmetic, and Problem Solving Behavior Shown by Prospective Elementary Teachers. (The Pennsylvania State University, 1958.) Dis. Abst. 19: 1300; December 1958.

Oldham, Bill W. The Development and Appraisal of a Unit on Contemporaty Uses of Mathematics for Students of College Algebra. (University of Northern Colorado, 1972.) Dis. Abst. Int. 33B: 3203; January 1973.

Achievement was higher when students used application problems. [a; 2 classes (40 students); college]

Oliver, Alfred. A Measurement of the Effectiveness of an Interactive Display System in Teaching Numerical Analysis. [with] A Graphic Program for Numerical Analysis - User's Guide. (University of North Carolina at Chapel Hill, 1969.) Dis. Abst. Int. 30B: 4263-4264; March 1970.

Students who used an interactive graphics program achieved significantly more than a group not using the computer. [e; 2 groups; college]

Olsen, James Clarence. A Comparison of Two Methods of Teaching a Remedial Mathematics Course at the Community College. (Utah State University, 1974.) Dis. Abst. Int. 34A: 7522-7523; June 1974.

No significant differences were found between groups taught by individualized or lecture-textbook programs at either of two class times. [e; 4 groups; community college]

O'Neil, David Robert. A Study of Sixth Grade Teachers' Perceptions Regarding Selected Mathematical Concepts. (The University of Iowa, 1971.) Dis. Abst. Int. 32A: 4845-4846; March 1972.

Teachers' perceptions of mastery levels, importance of specific content, and time were "strikingly" similar. They placed a greater degree of importance on traditional content than on new content. [s; --; teachers in grade 6]

O'Neil, Harold F., Jr. Effects of Stress on State Anxiety and Performance in Computer-Assisted Learning. (The Florida State University, 1969.) Dis. Abst. Int. 31B: 1568; September 1970.

A stress condition affected high-stress students more than low-stress students; under both stress and non-stress conditions, high-stress students made more errors. [e; --; college]

Oravetz, Robert Franklin. A Study of the Effectiveness of Different Experimental Drill Patterns in Business Mathematics. (University of Pittsburgh, 1966.) Dis. Abst. 27A: 3373-3374; April 1967.

O'Regan, Patrick Joseph. Freshman Mathematics and a College Student's Current Level of Proficiency in Elementary Secondary School Mathematics. (New York University, 1966.) Dis. Abst. 27A: 2289; February 1967.

Osborne, Edmund Cole. A Comparison of Two Curriculums for the Preparation of Teachers of Mathematics in Secondary Schools and of the Students Trained Under Each. (Boston University School of Education, 1956.) Dis. Abst. 16: 1409-1410; August 1956.

Ouellette, Hugh Francis. Effects of Enrichment Problems on Attitude, Problem Solving Ability and Pattern Recognition Ability of Prospective Elementary School Teachers. (University of Northern Colorado, 1972.) Dis. Abst. Int. 33A: 6222; May 1973.

Predictors of achievement on the developed materials were found. The unit was considered satisfactory. [e; 4 classes (122 students); elementary pre-service]

Ozarowski, Peter Charles, Jr. A Study in the Design and Implementation of a Course in the Basic Fundamentals of Statistics Via a Computer. (The University of Alabama, 1973.) Dis. Abst. Int. 34A: 2310; November 1973.

Use of a CAI course resulted in higher achievement in less time than a conventionally taught group attained. [e: 46 adults; adult]

Pagano, Anthony Vincent. A Study of the Effectiveness of a Programed Course in Contemporary Algebra Adapted for Presentation Via Closed-Circuit Television. (The Pennsylvania State University, 1964.) Dis. Abst. 26: 909-910; August 1965.

Paige, James Park. The Effects of a Precalculus Limit Unit on Calculus Students' Understanding of Limit Related Topics - The Derivative and the Definite Integral. (The University of Michigan, 1973.) Dis. Abst. Int. 35A: 725; August 1974.

No significant differences in achievement or attitude scores were found between groups who had or did not have the limit unit. [e; 57 students; college]

Palmer, Gilbert A. A Study of the Effect of Two Methods of Instruction of the Effectiveness of Predictors of Achievement in a First Course in College Mathematics. (The University of Rochester, 1970.) Dis. Abst. Int. 31A: 3423; January 1971.

No significant differences in achievement were found, but achievement was more readily predictable for students having a student-centered tutorial approach than for those having a lecture-discussion approach. [e; 64 students; 13]

Papalia, Diana Ellen. The Status of Some Conservation Abilities Across the Life-Span. (West Virginia University, 1971.) Dis. Abst. Int. 32B: 4901; February 1972.

On formal operations tasks, conservation ability increased throughout childhood, but some differences were found among older adult groups. [s; 96 persons; ages 6 through 65+]

Pappin, Charlene Patricia. A Descriptive Study of Implementation of Specific Programmed Materials for Junior College Arithmetic Students. (Columbia University, 1973.) Dis. Abst. Int. 34A: 5488-5489; March 1974.

The programmed text appeared to help students achieve objectives. [s; 22 classes; community junior college]

Paradise, Michael Emmanuel. A Follow-Up Study of the Colorado State College Mathematics Graduates, 1950-1959. (Colorado State College, 1962.) Dis. Abst. 23: 4247-4248; May 1963.

Parkinson, Blaine Parkinson. The Effect of an Extended Post Information Feedback Interval, Anxiety and Ability on Programmed Learning with College Students. (University of Utah, 1964.) Dis. Abst. 25: 1753-1754; September 1964.

Parkman, Johnny Mack. Experiments on the Temporal Aspects of Simple Calculation. (Carnegie-Mellon University, 1972.) Dis. Abst. Int. 33B: 1273; September 1972.

Systematic reaction-time effects were found for the addition and multiplication algorithms studied. [s; --; adults]

Partin, Harold Wayne. The Effect of Verbalization Upon Certain Discovered Mathematical Generalizations. (Texas A & M University, 1973.) Dis. Abst. Int. 34A: 7471; June 1974.

No significant differences were found between groups having or not having student verbalization of generalizations, but some interaction effects with English aptitude were found. [e; 8 classes; college]

Partner, Bruce Earl. A Comparison of Achievement of Main and Branch Campus Mathematics Students. (The Ohio State University, 1968.) Dis. Abst. Int. 30A: 72; July 1969.

Patterson, Clarence Augustus. Prediction of Success in Initial Junior College Mathematics Courses. (Arizona State University, 1971.) Dis. Abst. Int. 32B: 1709-1710; September 1971.

Prediction equations were not the same for the three mathematics courses studied in two colleges; per cent of correct predictions ranged from 60 to 92. [r; 219 students; junior college]

Paul, Howard William. The Relationship of Various High School Mathematics Programs to Achievement in the First Course in College Calculus. (The Ohio State University, 1970.) Dis. Abst. Int. 31A: 3396; January 1971.

Significant differences in means favored groups which had high school calculus over groups not having high school calculus. [f; 526 students; 13]

Pavlick, Frank Michael, Jr. The Use of Advanced Sets in the Teaching of Limits: A Comparative Study. (The Florida State University, 1968.) Dis. Abst. 29A: 518; August 1968.

Peck, Lyman Colt. The Preparation of College Mathematics Instructors. (The Ohio State University, 1953.) Dis. Abst. 19: 1666-1668; January 1959.

Peel, Nancy Dale. An Analysis of the Mathematics Taught in Grades One Through Eight as Applied to Selected Industrial Occupations. (Indiana University, 1967.) Dis. Abst. 28A: 4028; April 1968.

Perkins, Ruth Marion. Ways of Providing for Individual Differences in Elementary Mathematics. (The University of Michigan, 1967.) Dis. Abst. 28A: 4937; June 1968.

Perry, Roy Donald. A Study, Using CUPM Recommendations as Criteria, of Selected Components of the Two-Year College Mathematics Programs in Seven States. (University of Houston, 1971.) Dis. Abst. Int. 32A: 3672-3673; January 1972.

A typical college was found to offer eight of 15 CUPM-recommended courses. Journal subscriptions and faculty background were also surveyed. [s; 20 colleges; junior college]

Perry, Robert D. Prediction Equations for Success in College Mathematics. (George Peabody College, 1934.)

Peskin, Anne Stern. Teacher Understanding and Attitude and Student Achievement and Attitude in Seventh Grade Mathematics. (New York University, 1964.) Dis. Abst. 26: 3983-3984; January 1966.

Pestrue, George Edward. The Effect of n Achievement, Self-Esteem and Instructions on the Performance of a Simple Addition Task by Hospitalized Physically-Ill Patients. (Northwestern University, 1970.) Dis. Abst. Int. 31B: 4369; January 1971.

Subjects with specific performance goals achieved better than those without such goals. [e; --; adults]

Peterson, Daniel Ray. An Analysis of the Mathematics Necessary for a Course in Research Statistics for the Behavioral Sciences. (North Texas State University, 1972.) Dis. Abst. Int. 33A: 6222-6223; May 1973.

A core of common topics, with a common set of mathematics operations involved, was found in nearly all beginning research statistics courses. [s; 40 colleges; college]

Pethtel, Richard Dean. A Comparative Analysis of the Effect of Television Instruction on Achievement in a College Mathematics Course for Elementary Teaching Majors. (Indiana University, 1967.) Dis. Abst. 28A: 2142; December 1967.

Pettofrezzo, Anthony Joseph. A Comparison of the Relative Effectiveness of Two Methods of Teaching Certain Topics in Solid Analytic Geometry to College Freshmen. (New York University, 1959.) Dis. Abst. 20: 4604; June 1960.

Pfetzing, John Joseph. Student Utilization of Computer Assisted Instruction Made Available in Elementary Undergraduate Mathematics. (The Ohio State University, 1972.) Dis. Abst. Int. 33A: 5981; May 1973.

Although students reacted positively to CAI, they did not use CAI when they had a free choice. [e; 3 groups; college]

Phillips, Clarence Alois. The Relationship Between Achievement in Elementary Arithmetic and Vocabulary Knowledge of Elementary Mathematics as Possessed by Prospective Elementary Teachers. (University of Illinois, 1959.) Dis. Abst. 20: 1687-1688; November 1959.

Phillips, Jerry Wayne. Small Group Laboratory Experiences as an Alternative to Total Group Instruction for College Low Achievers in Mathematics. (Indiana University, 1970.) Dis. Abst. Int. 31A: 5945; May 1971.

No significant difference in achievement was found between group having or not having mathematics laboratory instruction for one course. [e; 2 groups; college]

Phillips, Orval Lewis. A Proposed Program for the Training of Mathematics Teachers for the Public Secondary Schools of Mississippi. (Columbia University, 1950.)

Picard, Anthony John. An Analysis of the Objectives of a First Year Calculus Sequence, A Test for the Achievement of These Objectives, and an Analysis of Results. (The Ohio State University, 1967.) Dis. Abst. 28A: 3379-3380; March 1968.

Pierce, David Randall. A Comparison of the Conventional, Printed-Programed and Audio-Programed Methods of Teaching Remediation-Oriented Mathematics. (Purdue University, 1969.) Dis. Abst. Int. 30A: 4692; May 1970.

Low-predictor-level students made more achievement gain under the printed program method, but this method produced less attitude gain. The conventional method was found to be best for producing achievement at the knowledge level, while the programs were equally effective at understanding and applications level. [--; 43 students; college]

Pinneo, Robert Orin. A Comparative Study of Time-Sharing Vs. Batch Processing in the Teaching of Introductory Programming in FORTRAN. (Oregon State University, 1973.) Dis. Abst. Int. 34A: 1148-1149; September 1973.

No significant differences were found between students using time-sharing or batch processing. [e; --; college]

Pintel, Gerald. The Effectiveness of Admissions Criteria in Relation to the Timely Completion of a Business Administration Curriculum by Students Enrolled in a Community College. (New York University, 1970.) Dis. Abst. Int. 32A: 1303; September 1971.

High-school mathematics average was one of three factors in an equation for predicted success in the business administration curriculum. [r; --; community college]

Pitkin, Tony Ray. A Comparison of the Attitudes Toward Mathematics and Toward Pupils of Selected Groups of Elementary School Teachers Who Had Different Types and Amounts of College Education in Modern Mathematics. (University of South Dakota, 1968.) Dis. Abst. 29A: 3025-3026; March 1969.

Pitts, Carl Thomas. A Study of the Required Mathematics Content Courses for Undergraduate Elementary Majors in the United States. (Indiana State University, 1973.) Dis. Abst. Int. 34A: 5491; March 1974.

Recommendations of two national groups (CUPM and Cambridge Conference) have not been implemented by the majority of colleges. [s; 445 colleges; elementary pre-service]

Plachy, Jon Milton. A Determinative Analysis of the Introductory College Mathematics Course with Regard to Approach Effectiveness. (Oklahoma State University, 1964.) Dis. Abst. 26: 1432; September 1965.

Poage, Melvin L. The Use of Teacher-Directed Laboratory to Individualize Instruction for Remedial Mathematics in College Courses. (Michigan State University, 1972.) Dis. Abst. Int. 33A: 4692-4693; March 1973.

It was concluded that a teacher-directed mathematics laboratory approach was more effective than a student-directed laboratory approach. [e; --; college]

Pocock, Richard Charles. Advanced Placement Calculus as a Factor in the Study of College Mathematics. (Columbia University, 1974.) Dis. Abst. Int. 35A: 850-851; August 1974.

Differences between Advanced Placement Credit and Non-Credit students were analyzed. [a; 2 colleges; 14-16]

Podbelsek, Allan Roy. A Study of Various Deductive Models for Developing and Teaching Plane Trigonometry Including an Investigation of the General Nature of Trigonometry. (University of Illinois at Urbana-Champaign, 1972.) Dis. Abst. Int. 33B: 4916; April 1973.

The history, general structure, models for development, and analysis of trigonometry were presented, for use in teacher education programs. [d; --; secondary pre-service]

Prekeges, Demitrios Peter. The Relationship Between Selected Teacher Variables and Growth in Arithmetic in Grades Four, Five, and Six. (The University of British Columbia (Canada), 1974.) Dis. Abst. Int. 35A: 3578; December 1974.

No significant correlations were found between the teacher-background variables studied and pupil achievement. [r; 61 classes (61 teachers); teachers in grades 4-6]

Price, Richard Lionel. Scholastic Aptitude Test in Mathematics as a Predictor of Student Selection of Algebraic Versus Geometric Approaches to Problem Solving. (The Ohio State University, 1969.) Dis. Abst. Int. 30A: 4340; April 1970.

Students achieved best on problems related to their interests, and tried to characterize new problems in terms of types with which they were familiar. [e; 3 classes (97 students); post-secondary]

Price, William Edward. A Mastery Learning Strategy for College Freshman Mathematics. (State University of New York at Buffalo, 1971.) Dis. Abst. Int. 32A: 841; August 1971.

No significant differences in achievement were found between groups taught by a mastery learning or a traditional approach. With time, mastery learning appeared increasingly effective. [e; 118 students; 13]

Pride, Bonnie Loraine. A Critical Analysis of Computer Utilization by Mathematics Departments in Selected Small Colleges. (George Peabody College for Teachers, 1972.) Dis. Abst. Int. 33B: 1674-1675; October 1972.

In 82 per cent of the colleges surveyed, the computer was used in one or more mathematics courses; 73 per cent of the institutions gave students direct access to the computer. [a; 134 colleges; college]

Pruitt, Robert. The Mathematics Preparation of Select Secondary School Teachers of Mathematics in Ohio Public Schools, 1961-1962. (The Ohio State University, 1963.) Dis. Abst. 24: 4574; May 1964.

Purcell, William James. Some Factors Affecting Attitudes of Prospective Teachers Toward Elementary Mathematics. (Columbia University, 1964.) Dis. Abst. 25: 5144; March 1965.

Qualls, Lula Jane. Effects of Review and Cueing on Elementary School Teachers' Performance on a Standardized Mathematics Test. (The University of Tennessee, 1969.) Dis. Abst. Int. 30A: 4693; May 1970.

The treatment in which teachers were given cues appeared more effective than merely taking a second form of the test, but not more effective than review and giving correct answers. No differences among treatments were apparent for students. [e; 54 teachers, 54 pupils; teachers, grades 1-6]

Quinn, Mildred Louise Hudnall. A Study of the Teaching of Business Arithmetic and Clerical Office Machines (Calculators) as a Combined Course. (University of Kentucky, 1973.) Dis. Abst. Int. 34A: 6370; April 1974.

The feasibility of a combined course was indicated by arithmetic scores. [e; 349 students; college]

Raeihle, Sister Mary Jane, C.S.J. The Relation Between Elementary School Teachers' Understanding of Properties of the Real Numbers and Pupil Achievement in Mathematics. (Columbia University, 1972.) Dis. Abst. Int. 33A: 1987-1988; November 1972.

Fifth grade teachers who exhibited knowledge of properties had students who achieved more. [s; 2014 pupils, 48 teachers; teachers, grade 5]

Raines, Bob Gene. Personal, Situational and Behavioral Predisposition Factors Related to the Elementary Teachers' Attitude Toward Teaching Mathematics. (University of Virginia, 1970.) Dis. Abst. Int. 31A: 4631; March 1971.

Virginia teachers had a very favorable attitude toward the teaching of mathematics. Teachers trained specifically for elementary teaching and those with a strong mathematics background were likely to have favorable attitudes. [s; 329 teachers; teachers in grades 3-6]

Ralston, Nancy Carolin . A Study of the Advanced Placement Program in the Cincinnati Public Schools. (Indiana University, 1961.) Dis. Abst. 22: 3074-3075; March 1962.

Ramey, Carl Victor. The Identification and Remediation of Mathematical Skill Deficiencies in Freshman College Chemistry. (Indiana University, 1973.) Dis. Abst. Int. 34A: 4996-4997; February 1974.

The group given programmed materials scored significantly better than groups informed of deficiencies only or given references. [e; --; 13]

Ramstad, William Kvindlog. A Study of Staff Utilization Experimentation in Selected Public Junior Colleges. (Stanford University, 1963.)

Randall, David Robert. A Study of the Validity of a Self-Instructional Teaching Methodology for Calculus Derived From a Systems Approach to Instruction. (The University of Michigan, 1971.) Dis. Abst. Int. 32A: 6852; June 1972.

A self-instruction approach was not as effective as the lecture approach. [e; 4 classes (77 students); 13]

Randall, John Douglas. The Effectiveness of Remedial Arithmetic Courses in Three Selected California Community Colleges as Measured by Improvement in Arithmetic Skills and Attitudes Toward Mathematics. (University of Southern California, 1972.) Dis. Abst. Int. 33A: 1422; October 1972.

Students felt that remedial arithmetic courses were effective; lecture-discussion course resulted in better attitudes than courses using programmed materials. [s; 884 students; community college]

Ray, Marilyn Miller. The Preparation of Teachers of Elementary School Mathematics in Louisiana. (The University of Oklahoma, 1967.) Dis. Abst. 28A: 2127; December 1967.

Recker, Frank William. Status and Trends in Mathematics in Ohio Secondary Schools. (Western Reserve University, 1965.) Dis. Abst. 27A: 333-334; August 1966.

Rector, Robert Earl. The Relative Effectiveness of Four Strategies for Teaching Mathematical Concepts. (University of Illinois, 1968.) Dis. Abst. 29A: 520; August 1968.

Reed, Jerry Franklin. The Relative Effectiveness of Programmed and Conventional Textbooks as Supplements to Classroom Lecture in the Teaching of Elementary Modern Mathematics. (Mississippi State University, 1971.) Dis. Abst. Int. 32A: 1989; October 1971.

No significant differences were found between groups using programmed or conventional textbooks. [e; 196 students; elementary pre-service]

Reeves, James William. A Critical Analysis of the Function Concept in Secondary School Mathematics. (The University of Florida, 1969.) Dis. Abst. Int. 31A: 1148-1149; September 1970.

In secondary school textbooks, function was generally developed as a set of ordered pairs, in very abstract form. Agreement was found on 16 points regarding functions in over one-half of the college texts analyzed. [d; --; secondary, college]

Regula, Walter Edwin. Preparation of the Mathematics Teachers in the Public Secondary Schools of West Virginia. (The Ohio State University, 1965.) Dis. Abst. 26: 1432-1433; September 1965.

Reimer, Dennis D. The Effectiveness of a Guided Discovery Method of Teaching in a College Mathematics Course for Non-Mathematics and Non-Science Majors. (North Texas State University, 1969.) Dis. Abst. Int. 30A: 626; August 1969.

Repshar, Sister Marilyn. A Comparison of a Survey Approach to Mathematics for College Freshmen with an Approach Based on Galois Theory. (Columbia University, 1968.) Dis. Abst. 29A: 3534; April 1969.

Rettig, William Leo, Sr. Views of Mathematics Held by a Selected Group of Secondary Mathematics Teachers in Pennsylvania. (The Ohio State University, 1971.) Dis. Abst. Int. 32A: 3571; January 1972.

Teachers with the most favorable view of mathematics were those with the highest GPA in mathematics and the largest number of credits in mathematics and mathematics education. [a; 253 teachers; secondary in-service]

Reys, Robert Edward. A Study of the Mathematics Preparatory Program for Elementary School Teachers of the University of Missouri at Columbia. (University of Missouri, Columbia, 1966.) Dis. Abst. 27A: 2926-2927; March 1967.

Rhoads, Margaret V. Recent Trends in Mathematical Requirements in the Education of Elementary Teachers. (Columbia University, 1950.)

Rice, Billie Ann Perrin. A Comparison of Computer-Assisted Instruction, Programmed Instruction, and Lecture in Teaching Fundamental Concepts of Calculus. (Georgia State University, 1973.) Dis. Abst. Int. 34B: 3927; February 1974.

The approach using CAI, programmed packets, and lectures appeared effective. [e; 55 students; 13]

Rice, Earl Clifton. The Transfer of Generalizing Ability From Mathematics to Other High-School Subjects. (George Peabody College for Teachers, 1957.) Dis. Abst. 18: 1450-1451; April 1958.

Rice, Jimmy Marshall. A Study of Attitudes of Elementary Teachers Toward Modern Mathematics Programs. (Oklahoma State University, 1964.) Dis. Abst. 26: 1433; September 1965.

Richard, Howard Marks Simon. New Careers Mathematics: The Effect Upon Achievement in Mathematics of Supplementing a Concept Centered Course for Adults with Experiences in Computer Utilization. (The Ohio State University, 1970.) Dis. Abst. Int. 31B: 4209-4210; January 1971.

No significant differences were found between adults who used the computer and those who did not. [e; 60 students; adults]

Richard, Tommy Harold. The Development and Appraisal of a Unit on Diophantine Equations for Prospective Elementary School Teachers. (University of Northern Colorado, 1971.) Dis. Abst. Int. 32A: 1966; October 1971.

Achievement and attitude toward the developed unit were satisfactory. [a; 51 students; elementary pre-service]

Richert, A. Allan. The Effect of Different Types of Twelfth-Grade Mathematics Courses on Achievement in a First Course in University Calculus. (University of Kansas, 1972.) Dis. Abst. Int. 33A: 6072-6073; May 1973.

None of the twelfth-grade courses considered was significantly better than the others in preparing students for analytic geometry and calculus in college. [f; 4 colleges; college]

Richtmeyer, Cleon C. Functional Mathematical Needs of Teachers. (Colorado State College of Education, 1937.)

Rickert, William John. An Attempt to Apply Selected Themes of Existentialism to Mathematical Education. (Rutgers University, The State University of New Jersey, 1973.) Dis. Abst. Int. 34A: 6522-6523; April 1974.

Aspects of existentialism appeared to affect achievement. Use of the existentialist approach was found feasible. [s; --; college]

Riggs, Paul Michael. Prediction of Success as a Mathematics Major at Selected Colleges and Universities in Louisiana. (University of Southern Mississippi, 1973.) Dis. Abst. Int. 34A: 4797; February 1974.

Predictor equations were reported. Females attained significantly higher GPAs than did males. [r; --; college]

Robbins, Rosemary Boehringer. Achievement Performance and Fantasy Arousal in College Women as a Function of the Motive to Avoid Success, Problem Format, and Relationship to Experimenter. (Temple University, 1973.) Dis. Abst. Int. 34B: 2950; December 1973.

No differences on mathematics examples were found between women classified as avoiding or not avoiding success, under "competition" or "encouragement" conditions. Both types of women performed better on female format than male format problems. [e; 86 women; college]

Roberts, Fannie M. Relationships in Respect to Attitudes Toward Mathematics, Degree of Authoritarianism, Vocational Interests, Sex Differences, and Scholastic Achievement of College Juniors. (New York University, 1970.) Dis. Abst. Int. 31A: 2134; November 1970.

Elementary education majors scored relatively high on mathematics attitudes but lacked clearly defined vocational interests. [s; 191 students; elementary pre-service]

Robinson, William Baker. The Effects of Two Semesters of Secondary School Calculus on Students' First and Second Quarter Calculus Grade at the University of Utah. (University of Utah, 1968.) Dis. Abst. 29B: 2990-2991; February 1969.

Robold, Alice Ilene. A Study of the Background of College Instructors of Mathematics for Prospective Elementary-School Teachers. (Ball State Teachers College, 1965.) Dis. Abst. 26: 3166; December 1965.

Rockhill, Theron David. Programed Instruction Vs. Problem Session as the Supplement to Large Group Instruction in College Mathematics. (State University of New York at Buffalo, 1969.) Dis. Abst. Int. 30B: 2305-2306; November 1969.

Roden, Kenneth Richard, Jr. An Analysis of the Most Widely-Used Elementary Calculus Textbooks in the United States for the Years of 1950, 1960, and 1970. (University of Arkansas, 1972.) Dis. Abst. Int. 32B: 5330-5331; March 1972.

The textbooks were examined in terms of 43 variables. [d; 30 textbooks; college]

Rodney, Cecil T. An Evaluation of Pre-Service Preparation for Teaching the Mathematics of the Elementary School. (University of Buffalo, 1952.)

Roethel, Louis F. A Project to Study the General Education Mathematics Curriculum Alternatives and to Develop a Concepts of Mathematics Course and Materials Based on Symbolic Logic for Use at Nassau Community College, Garden City, New York. (St. John's University, 1972.) Dis. Abst. Int. 33A: 667; August 1972.

A summary of the major mathematics concepts in the symbolic logic materials is included. [d; --; community college]

Rogers, Samuel Irving. A Comparative Analysis of the Individualized GED Instructional Program of Juneau, Alaska, to the Traditional GED Instructional Program of Anchorage, Alaska. (Kansas State University, 1973.) Dis. Abst. Int. 34A: 3007-3008; December 1973.

Some sex differences were reported when individualized or traditional GED programs were used. [f; —; adults]

Rollins, Tony James. The Use of Applications in Teaching Secondary School Mathematics with Emphasis on the Situation-Model-Theory Approach. (University of Kansas, 1973.) Dis. Abst. Int. 34A: 3181-3182; December 1973.

No significant differences were found between groups taught with an applications approach or "traditionally". The role of applications in secondary school mathematics is discussed. [e; 43 students; secondary pre-service]

Ronan, Richard James. A Study of the Relationships Between the Performance of College Freshmen in Mathematics and Selected Factors in Their Academic Background. (The University of New Mexico, 1969.) Dis. Abst. Int. 31A: 1694-1695; October 1970.

Size of high school attended and sex did not significantly affect achievement in college mathematics. How well a student does is more related to success than is the type of course (traditional or modern). [r; --; 13]

Roney, Maurice William. An Analysis of the Interrelationship of Mathematics, Science, and Technical Subject Matter in Selected Technical Institute Curricula. (University of Maryland, 1964.) Dis. Abst. 25: 4583; February 1965.

Rosenberg, Herman. The Impact of Modern Mathematics on Trigonometry: A Study of the Significance of Certain Concepts of Higher Mathematics for the Teacher of Trigonometry. (New York University, 1955.) Dis. Abst. 15: 1796-1797; October 1955.

Rothbart, Andrea May. A Course Based on Fermat's Last Theorem Which Motivates the Introduction of Some Basic Algebraic Notions. (University of Illinois at Urbana-Champaign, 1971.) Dis. Abst. Int. 32A: 5538; April 1972.

Procedures used in developing the course are described. [d; --; college]

Roughead, William George, Jr. A Clarification of Part of the Discovery Versus Exposition Discussion in Mathematics. (The Florida State University, 1966.) Dis. Abst. 27A: 2452-2453; February 1967.

Rouse, William Morrison, Jr. A Study of the Correlation Between the Academic Preparation of Teachers of Mathematics and the Mathematics Achievement of Their Students in Kindergarten Through Grade Eight. (Michigan State University, 1967.) Dis. Abst. 28A: 4031; April 1968.

Rowe, Jack Lavaughn. General Mathematics for Terminal Students in California Junior Colleges. (University of Colorado, 1957.) Dis. Abst. 19: 255; August 1958.

Rowell, Arlington Lee. A Study of Several Variables Used for Predicting the Academic Performance of Advanced Studies Students at the End of Their Freshman Year at Stetson University. (University of Southern Mississippi, 1973.) Dis. Abst. Int. 34A: 3925-3926; January 1974.

The mathematical sections in the SAT independently accounted for one per cent of the variance, while verbal sections accounted for four per cent. [r; --; 13]

Roye, James Paul. Modifications of Professional Characteristics of Teacher Participants in National Science Foundation Sponsored Academic Year Institutes. (Arizona State University, 1968.) Dis. Abst. 29A: 503; August 1968.

Rudd, Lonie Edgar. Growth of Elementary-School Teachers in Arithmetical Understandings Through In-Service Procedures. (The Ohio State University, 1957.) Dis. Abst. 18: 947; March 1958.

Russell, A. Eugene. Developing and Validating Learning Hierarchies in Non-Metric Geometry in Preservice Elementary School Mathematics Methods Courses. (Southern Illinois University, 1972.) Dis. Abst. Int. 33A: 4808-4809; March 1973.

Two hierarchies were found to be valid for teaching ideas about one- and two-dimensional figures. [a; 124 students; elementary preservice]

Ryan, Barney Joe. A Comparative Study of School Mathematics Study Group and Traditional Mathematics at the Secondary Level. (The University of Tulsa, 1970.) Dis. Abst. Int. 31A: 2020; November 1970.

Mean grades in a first-year college mathematics course were not significantly different for those who had the SMSG course in grade 12 and those in traditional courses. [f; 39 students; 13]

Sachdev, Sohindar Singh. Evaluation of the Impact of Summer Institutes for Higher Secondary Mathematics Teachers of Delhi, India, on the School Mathematics Curriculum of Delhi. (Utah State University, 1971.) Dis. Abst. Int. 32A: 6015-6016; May 1972.

No significant difference on objectives was found between participants and non-participants. Participants favored a guided discovery approach and "modern" courses. [s; 195 teachers; secondary in-service]

Sagan, Leon Francis. The Development and Validation of a Programmed Text for Collegiate Remedial Trigonometry. (University of Maryland, 1971.) Dis. Abst. Int. 32A: 2924; December 1971.

Significant gains in achievement were found for students using the programmed text. [a; 43 students; college]

Salhab, Mohammad Taleb. The Interaction Between Selected Cognitive Abilities and Instructional Treatments on Absolute Value Equations. (The University of Texas at Austin, 1973.) Dis. Abst. Int. 34A: 5495; March 1974.

The geometric and algebraic treatments were equally effective in producing learning and transfer. Prediction of achievement was possible using general reasoning and spatial visualization scores. [r; 45 students; secondary pre-service]

Sanchez, Florence Doris. Academic Performance in Introductory College Mathematics as Related to High School Course Patterns. (University of Southern Mississippi, 1972.) Dis. Abst. Int. 33A: 1331; October 1972.

Different patterns of courses in high school mathematics were not equally effective in influencing achievement in college courses. [f; 110 students; college]

Sanders, Ella Moye. The Relationship Between Verbal-Quantitative Ability and Certain Personality and Metabolic Characteristics. (The University of Texas, 1958.) Dis. Abst. 19: 2540-2541; April 1959.

Sanders, Richard Lee. A Study of the Use of the Survey of College Achievement as Both a Predictor and Criterion in Measuring Lakeland College Student Achievement. (Marquette University, 1971.) Dis. Abst. Int. 32A: 4382; February 1972.

Students made significant gains on mathematics and other tests during two years in college. [s; --; college]

Sandler, Barney. A Comparison of an Integrated Course in College Physics and Mathematics of One Semester Duration with Separate Courses in the Two Subjects in a Two-Year Community College. (New York University, 1961.) Dis. Abst. 22: 4295-4296; June 1962.

Scannicchio, Thomas Henry. Student Achievement in College Calculus, Louisiana State University 1967-1968. (Louisiana State University and Agricultural and Mechanical College, 1969.) Dis. Abst. Int. 30A: 1344-1345; October 1969.

Schaefer, Sister Mary Geralda. A Critical Analysis of the Mathematics Programs in Selected Catholic Secondary Schools in the United States. (The University of Texas, 1967.) Dis. Abst. 27A: 4174; June 1967.

Schaumberger, Norman. A Comparison of Two Methods of Teaching Certain Topics in Analytic Geometry. (Columbia University, 1962.) Dis. Abst. 24: 758-759; August 1963.

Schlessinger, Frederick Richard. A Study and Evaluation of Sponsored Programs for High School Science and Mathematics Teachers During the Summer of 1956. (The Ohio State University, 1957.) Dis. Abst. 18: 2073-2074; June 1958.

Schloff, Charles E. An Exploratory Study of Teachers' Application of Inductive Approaches in Developing an Awareness of Geometry with Fifth and Sixth Grade Children. (Wayne State University, 1972.) Dis. Abst. Int. 33A: 6076-6077; May 1973.

Pupils whose teachers attended three in-service seminars learned the geometric ideas studied. [a; 12 teachers, 293 pupils; teachers in grades 5, 6]

Schmelter, Raymond Charles. A Study of Attitude Change of Elementary Teachers in an In-Service Mathematics Education Program. (The University of Wisconsin, 1969.) Dis. Abst. Int. 31A: 667-668; August 1970.

Significant gains in attitude toward mathematics and toward specified instructional techniques, including television, were found. Attitude toward radio instruction decreased. [e; 213 teachers; elementary in-service]

Schmidt, Gary E. The Effectiveness of Large Lecture Recitation Sections Versus Small Group Classes and the Influence of Compulsory-Homework-and-Quizzes on the Achievement and Attitudes of Calculus II Students. (Kansas State University, 1973.) Dis. Abst. Int. 35A: 222; July 1974.

No significant differences in achievement were found between students in large lectures or smaller classes, or having homework with or without quizzes. [e; 269 students; college]

Schoen, Harold Leo. A Comparison of Four Types of Feedback to Student Responses in a CAI Unit Designed to Teach the Concept of Function to Pre-Calculus College Students. (The Ohio State University, 1971.) Dis. Abst. Int. 32A: 2508; November 1971.

Individualized feedback resulted in higher achievement than did generalized feedback. [e; 60 students; college]

Schowengerdt, George C. The Relationship of Student and Instructor Pas Type to Student Achievement in Calculus. (University of Missouri, Columbia, 1969.) Dis. Abst. Int. 30B: 5228; May 1970.

No significant relationships were found between personality pattern and calculus achievement. [r; 96 students; 13]

Schrank, Wilburn Ronold. Relationships Between Ability Grouping and Academic Achievement in the Mathematics Course at the United States Air Force Academy Preparatory School. (Texas A & M University, 1967.) Dis. Abst. 28A: 3949; April 1968.

Schroeder, James Carl. A Study of the Relationship Between Remediation and Reduced Credit Hour Load and the Success of Open Admissions Students at the University of Toledo. (The University of Toledo, 1972.) Dis. Abst. Int. 33A: 4761-4762; March 1973.

Remediation in mathematics tended to be correlated with success. [r; 195 students; college]

Schuler, Nevin Deily. The Effect of the Administration of Two Federal Laws on Secondary Mathematics in Selected States. (The Pennsylvania State University, 1962.) Dis. Abst. 23: 4200-4201; May 1963.

Schultz, James Edward. Approaches to Teaching Mathematics Content to Prospective Elementary Teachers. (The Ohio State University, 1971.) Dis. Abst. Int. 32A: 3848; January 1972.

Eight approaches were compered; no significant differences in achievement could be attributed to lecture, recitation, or interaction effects. Some differences between groups were specified. [a; --; elementary pre-service]

Schumaker, John Abraham. Trends in the Education of Mathematics Teachers: A Study of the Education of Senior High School Mathematics Teachers in Selected Teacher Education Institutions in the United States in the Period 1920-1958. (New York University, 1959.) Dis. Abst. 20: 4044-4045; April 1960.

Schunert, Jim R. The Association of Mathematical Achievement with Certain Factors Resident in the Teacher, in the Teaching, in the Pupil, and in the School. (University of Minnesota, 1951.)

Schwartzfisher, Rose Ann. A Case Study of the Effect of an Innovative Approach in a College General Education Mathematics Course. (Michigan State University, 1973.) Dis. Abst. Int. 34A: 7525; June 1974.

After taking the course, students achieved better on tests of computation, historical problems, and other problems. [a; --; college]

Schwieger, Ruben Don. A Component Analysis of Mathematical Problem Solving. (Purdue University, 1974.) Dis. Abst. Int. 35A: 3308-3309; December 1974.

A model was judged and tested with students; it appeared to include the components necessary and sufficient for explaining the problem-solving process. [s; --; 7 - graduate student]

Scott, Bob Ray. A Study of the Mathematics Curriculum of the Public Junior Colleges in the North Central Accrediting Region. (University of Missouri, Columbia, 1968.) Dis. Abst. 29A: 2451-2452; February 1969.

Scott, Ralph Lincoln. The Relationship Between Achievement in High School and Success in College with Reference to Science and Mathematics. (University of Arkansas, 1966.) Dis. Abst. 27A: 639; September 1966.

Scott, Roger Owen. Mathetic and Progressive Chain Strategies for Instructional Sequencing. (The University of Michigan, 1968.) Dis. Abst. Int. 30A: 593; August 1969.

Scrittorale, Louis. The Business Mathematics' Needs of Community/Junior College Business Majors. (Colorado State University, 1972.) Dis. Abst. Int. 33A: 6656; June 1973.

Following a survey about mathematics needed by business employees, a business mathematics topical outline was developed which included 20 of 25 needed applications. [s; 200 adults; community, junior college]

Seber, Robert Charles. The Development and Organization of Teaching Materials in a Collegiate Mathematics Program for Students of the Non-Physical Sciences, Part I. (State University of Iowa, 1956.) Dis. Abst. 16: 968; May 1956.

Segalla, Angelo. Predicting the Problem Solving Difficulty Level of Word Problems Presented in CAI Mode to Junior College Arithmetic Students. (University of California, Los Angeles, 1973.) Dis. Abst. Int. 34A: 1598; October 1973.

Memory, length, and other variables were found to be of importance in determining problem difficulty. [s; 44 students; junior college]

Selser, Will Lindsey. An Evaluation of an In-Service Institute for Improving Science and Mathematics Instruction in the Hillsborough County Junior High Schools. (The University of Florida, 1962.) Dis. Abst. 23: 3804-3805; April 1963.

Shafer, Dale Marks. The Development and Testing of Subject Matter for a Course in Methods of Teaching Secondary School Mathematics. (The University of Oklahoma, 1967.) Dis. Abst. 28A: 1722-1723; November 1967.

Shakrani, Mosen Sharif. A Formative Evaluation of the Mathematics Component of an Experimental Elementary Teacher Education Program at Michigan State University. (Michigan State University, 1973.) Dis. Abst. Int. 34A: 3223; December 1973.

The activity-oriented integrated content-methods course concurrent with clinical experience had a significant positive effect on achievement and attitudes. [s; 38 students; elementary pre-service]

Shana'a, Joyce Adrian. A Statistical Analysis of the Placement Program in Mathematics for Freshmen at the University of Oklahoma. (The University of Oklahoma, 1966.) Dis. Abst. 27A: 1629-1630; December 1966.

Sharrock, Ruth Youngblood. An Analysis of the Qualifications of the Mathematics Instructors and of the Content of the Mathematics Courses in the Community Colleges of North Carolina. (University of North Carolina at Greensboro, 1972.) Dis. Abst. Int. 33A: 1465; October 1972.

All mathematics instructors had a master's degree. About 25 courses, varying in content, were offered. [s; 15 colleges; community college]

Shatkin, Stephen David. A Study of the Change of Attitudes Toward Mathematics of Prospective Elementary School Teachers. (The Ohio State University, 1968.) Dis. Abst. 29A: 2904; March 1969.

Shawer, Maher Youssef. A Statistical Analysis of the Growth of Understanding Mathematical Concepts by the Prospective Elementary Teacher. (The University of Oklahoma, 1968.) Dis. Abst. 29B: 2994; February 1969.

Shelton, Ronald Myron. A Comparison of Achievement Resulting from Teaching the Limit Concept in Calculus by Two Different Methods. (University of Illinois, 1965.) Dis. Abst. 26: 2613-2614; November 1965.

Sheofee, Jim Bartley. A Comparative Study of the Effectiveness of Two Methods of Teaching Mathematics to Prospective Elementary School Teachers. (The University of Mississippi, 1970.) Dis. Abst. Int. 31A: 4606-4607; March 1971.

The expository approach resulted in a more positive change in attitude than the guided-discovery approach; no achievement difference was found. [a; 2 classes (82 students); elementary pre-service]

Sher, Lawrence A. The Effect of a Topic of Symbolic Logic on the Reading Comprehension of First Year Community College Students. (New York University, 1974.) Dis. Abst. Int. 35A: 2661; November 1974.

Reading comprehension did not show improvement on an immediate posttest after use of a unit on logic, although some students showed gain on a retention test. [e; 12 sections; community college]

Shiflett, Lilburn Thomas. A Comparative Study of Programed and Conventional Instruction in Mathematics at the College Level. (George Peabody College for Teachers, 1963.) Dis. Abst. 24: 5441-5442; June 1964.

Shipman, Jerry Roger. Toward a Theory of Sequencing: Study 3-3: The Development and Validation of a Curriculum Hierarchy Designed for Use in Teaching Selected Principles and Strategies of an Aspect of Critical Thinking. (The Pennsylvania State University, 1973.) Dis. Abst. Int. 35A: 1433; September 1974.

Students were able to give correct validity judgments of verbal simple conditional arguments as a result of explicit instruction on judging validity of simple arguments in symbolic form followed by practice on translating from verbal to symbolic form without explicit instruction. [e; 115 students; elementary pre-service]

Shoemaker, Byrl Raymond. Adequacy of Related Technical Instruction in Vocational Trade and Industrial Education in Teaching Principles of Mathematics and Physical Science. (The Ohio State University, 1957.) Dis. Abst. 17: 1517; July 1957.

Shoemaker, Richard Warren. An Investigation to Determine the Elements of Mathematics Needed to Develop the Theoretical Content of the Introductory Course in Engineering Physics and Fourteen Undergraduate Courses in Electrical Engineering. (University of Michigan, 1954.) Dis. Abst. 14: 1167; August 1954.

Shouk, Mahmoud Ahmed Ali. A Program for Pre-Service Education of Mathematics Teachers for the Secondary Schools of the U.A.R. (Columbia University, 1965.) Dis. Abst. 27A: 132; July 1966.

Showers, Frederick Mansfield. A Survey of the Status of Instruction in the History of Mathematics. (The University of Florida, 1973.) Dis. Abst. Int. 34A: 7092-7093; May 1974.

The history of mathematics course was infrequently offered and required, though it was considered valuable by both mathematicians and mathematics educators. [s; --; secondary pre- and in-service]

Shryock, Alfred Jerry. A Study of Mathematics Background Courses for Elementary School Teachers. (State University of Iowa, 1962.) Dis. Abst. 23: 1562-1563; November 1962.

Shuert, Keith L. A Study to Determine Whether a Selected Type of Cognitive Style Predisposes One To Do Well in Mathematics. (Wayne State University, 1970.) Dis. Abst. Int. 31A: 3352-3353; January 1971.

Elements of cognitive style held by successful and unsuccessful mathematics students were listed. [r; —; college]

Shuler, Ceroline Eucebia. The Professional Treatment of Freshman Mathematics in Teachers Colleges. (George Peabody College for Teachers, 1933.)

Simmons, Harold Franklyn. Achievement in Intermediate Algebra Associated with Class Size at the University of Wichita. (Iowa State College, 1958.) Dis. Abst. 19: 474; September 1958.

Simpson, Stephanie Nauminow. The Remedial Mathematics Curriculum in Selected California Community Colleges. (University of Southern California, 1972.) Dis. Abst. Int. 33A: 3331; January 1973.

Remedial courses in community colleges were essentially the same courses taught at the secondary-school level. Appropriate topics and sequences were determined. [s; --; community college]

Singleton, David George. The Impact of an In-Service Training Program in Modern Mathematics on Teachers' Knowledge of Modern Math Concepts, Teachers' Attitude Toward Mathematics, and Pupils' Performance on Standardized Achievement Tests. (Duke University, 1971.) Dis. Abst. Int. 32A: 5661; April 1972.

The in-service program was effective in improving teachers' understanding of and attitude toward mathematics. Pupils gained in achievement of arithmetic concepts more after teachers had the in-service program. [e; 2006 pupils, 92 teachers; teachers in grades 1-8]

Skillman, Allan Geoffrey. The Effect on Mathematics Achievement of Teaching Reading in a Mathematics Class at Casper College. (Montana State University, 1972.) Dis. Abst. Int. 33A: 4251; February 1973.

Emphasis on reading techniques improved mathematical achievement in college algebra but not basic algebra or calculus. [e; 6 classes; college]

Skipper, Slade Welma. A Study of the Use of Manipulative Materials as Multiple Embodiments for the Study of Numeration Systems by Prospective Elementary Teachers. (University of Missouri-Columbia, 1972.) Dis. Abst. Int. 34A: 1168-1169; September 1973.

Students taught by the lecture method scored as well or better on tests of understanding, computation, and transfer as did students taught through material-oriented units. Those taught with two embodiments scored as well or better than those taught with one embodiment. [e; 145 students; elementary pre-service]

Slay, Jack C. The Effects of the Method Used to Integrate Homework and Classwork on Attitudes and Achievement in College Algebra. (Mississippi State University, 1972.) Dis. Abst. Int. 33A: 1333-1334; October 1972.

No significant differences were found between classes in which homework was not integrated or was discussed in class by teacher or students. [e; 86 students (3 classes); college]

Sloan, Robert Samuel. An Analysis of Lower Division Mathematics Course Offerings in Selected Universities Between 1872 and 1952. (The University of Texas, 1961.) Dis. Abst. 21: 3803; June 1961.

Smail, Robert William. Relationships Between Pupil Mean-Gain in Arithmetic and Certain Attributes of Teachers. (State University of South Dakota, 1959.) Dis. Abst. 20: 3654-3655; March 1960.

Small, Dwain E. Opinions of Secondary Mathematics Teachers Concerning the Fifth Year of Teacher Education. (Indiana University, 1955.) Dis. Abst. 15: 2120-2121; November 1955.

Smith, Clarence Corydon, Jr. Partner Learning and Its Effects on Achievement and Attitude Toward Mathematics Among Undergraduates. (New Mexico State University, 1973.) Dis. Abst. Int. 34A: 1777-1778; October 1973.

Learning in pairs was found to be effective. [a; 12 classes; college]

Smith, Edwin Malcolm Ramsey. The Preparation of Elementary School Teachers in Indiana for the Emerging School Mathematics Curriculum. (Ball State University, 1971.) Dis. Abst. Int. 32A: 1388-1389; September 1971.

Most teachers reported favorable attitudes toward mathematics. Their college courses had included much of the geometry recommended by CUPM, but little of the algebra. [s; 820 teachers; elementary in-service]

Smith, Gerald John. The Effects on College General Education Mathematics Students of Learning Mathematics Through the Active Manipulation of Materials. (University of Oregon, 1974.) Dis. Abst. Int. 35A: 809-810; August 1974.

Attitudes toward including manipulation of materials in courses were positive. [a; 69 students; college]

Smith, James Lester. Foundations in Geometry for High School Teachers. (Oklahoma State University, 1963.) Dis. Abst. 25: 949; August 1964.

Smith, James Philip. The Effect of General Versus Specific Heuristics in Mathematical Problem-Solving Tasks. (Columbia University, 1973.) Dis. Abst. Int. 34A: 2400; November 1973.

Students who received heuristic instruction did not solve more transfer problems or work faster than students who received task-specific instruction. [e; 176 students; college]

Smith, Jerry Miller. A Study of the Effect of Laboratory Experience in a Mathematics Class. (West Virginia University, 1970.) Dis. Abst. Int. 31A: 2023; November 1970.

Laboratory experience facilitated the learning and retention of concepts. [e; 48 students; college]

Smith, Joe Kelly. The Development and Testing of a Teach-Test Instrument for Prediction of Success in College Freshman Mathematics. (The Florida State University, 1967.) Dis. Abst. 28A: 1633; November 1967.

Smith, John Melvin. Relations Among Behavioral Objectives, Time of Acquisition, and Retention. (University of Maryland, 1970.) Dis. Abst. Int. 31A: 3973-3974; February 1971.

Students informed of the structure and objectives of a learning sequence did not complete the sequence more rapidly than uninformed students. Time and retention were related. [e; 73 students; college]

Smith, Joseph. Probability and Statistics: Part of a Mathematics Curriculum for Capable But Poorly Prepared College Freshmen. (Rutgers University, The State University of New Jersey, 1973.) Dis. Abst. Int. 34A: 3851; January 1974.

The developed unit appeared to be effective. [a; 53 students; 13]

Smith, Quentin Clark. A Comparison of a Heuristic and a Traditional Method of Teaching a Preparatory Course in Mathematics to College Freshmen and Sophomores. (University of Missouri at Kansas City, 1967.) Dis. Abst. 28A: 3573; March 1968.

Smith, Roland Frederick. An Experimental Comparison of Two Liberal Arts Courses in General Mathematics at Syracuse University. (Syracuse University, 1955.) Dis. Abst. 15: 2538-2539; December 1955.

Smith, Shelby Dean. A Survey of Mathematics Teachers in Illinois, 1963-64. (University of Illinois, 1966.) Dis. Abst. 27A: 2091; January 1967.

Smith, Sigmund Arnold. Prediction of Achievement in Analytic Geometry and Calculus. (The Pennsylvania State University, 1964.) Dis. Abst. 25: 2544-2545; October 1964.

Smith, Wallace Robert. The Achievement of Eighth-Grade Students in Arithmetic with Respect to Selected Patterns of Teacher Preparation. (The University of Oklahoma, 1964.) Dis. Abst. 25: 3947; January 1965.

Smotherman, Thurman Edwin. The Significance of Discrepancies Between Quantitative and Linguistic Abilities for Scholastic Success and College Adjustment. (University of Missouri, 1951.) Dis. Abst. 11: 618-620; Issue 3, 1951.

Sneed, Billy Ray. A Study of the Qualifications of Mathematics Instructors in the Regionally Accredited Public Junior Colleges of Mississippi. (The University of Mississippi, 1969.) Dis. Abst. Int. 30A: 2407; December 1969.

Snyder, Delbert Wayne. A Comparison of the Laboratory and Lecture Approaches to a Mathematics Course for Preservice Elementary Teachers. (University of Oregon, 1973.) Dis. Abst. Int. 34A: 5786-5787; March 1974.

No significant differences in achievement or attitude were found between groups having a laboratory or a lecture approach. [e; 2 classes (39 students); elementary pre-service]

Soetsber, Warren Harvey. Major-Minor Teaching Assignments and Related Pupil Achievement. (Colorado State College, 1969.) Dis. Abst. Int. 30A: 4205; April 1970.

Students achieved more when taught by mathematics teachers with more than two years of experience, a high GPA, and above average knowledge. [r; 34 teachers, 1930 students; 9, teachers]

Sommers, Dean David. A Study of Selected Factors Predictive of Success in Calculus at Hope College. (The Ohio State University, 1973.) Dis. Abst. Int. 34A: 6885; May 1974.

High school GPA in mathematics was the best single predictor of success in calculus, accounting for 39 per cent of the variance. [r; 133 students; 13]

Sonner, Jan Raymond. A Study of the Perceptions of Their Curricula by the 1966-1969 Graduates in Engineering, Engineering Technology, and Industrial Technology at Southern Illinois University at Carbondale. (Southern Illinois University, 1972.) Dis. Abst. Int. 33A: 995-996; September 1972.

The graduates surveyed were "reasonably happy" with the mathematical level of their programs. [s; 315 graduates; college]

Sowell, Katye Oliver. A Study Concerning the Effect of an Aural Increment in Programed Auto-Instructional Mathematical Material for College Students. (The Florida State University, 1965.) Dis. Abst. 26: 4513; February 1966.

Sparks, Jack Norman. A Comparison of Iowa High Schools Ranking High and Low in Mathematical Achievement. (State University of Iowa, 1960.) Dis. Abst. 21: 1481-1482; December 1960.

Spaulding, Raymond Earl. An Investigation Into Two Factors in the Acquisition and Transfer of Principles by College Students in Two Mathematical Settings. (University of Maryland, 1971.) Dis. Abst. Int. 32A: 5622; April 1972.

Presentation order had little effect on the learning of a principle, whether negative or positive examples were used. [e; 362 students; college]

Speidel, Gisela Elisabeth. The Reinforcement Effects of Contingent Self-Reward. (University of Hawaii, 1972.) Dis. Abst. Int. 34B: 428; July 1973.

Students rewarded by teacher or self achieved significantly more than non-rewarded students only on number of addition examples completed. [e; 45 students; college]

Spillane, Daniel Paul. The Attitudes of Pennsylvania Secondary Mathematics Teachers Toward the Inclusion of Analytic Geometry, Calculus, and Statistics in the High School Program. (University of Pittsburgh, 1959.) Dis. Abst. 20: 1646; November 1959.

Stallings, Daniel Norman. An Analysis of the Characteristic Differences Between Successful and Unsuccessful Technical Mathematics Students. (University of North Carolina at Chapel Hill, 1969.) Dis. Abst. Int. 31A: 182; July 1970.

In general, analyzed factors had little relation to success; the pre-math test was the best predictor. [r; --; post-secondary]

Stannard, William Albert. The Effect on Final Achievement in a Beginning Calculus Course Resulting From the Use of Programmed Materials Written to Supplement Regular Classroom Instruction. (Montana State University, 1966.) Dis. Abst. 27A: 1723-1724; December 1966.

Stearley, Lincoln Lee. A Study of the Professional Qualifications and Interests of the Teachers of Freshman and Sophomore Mathematics in the State-Supported Institutions of Higher Learning in Michigan. (Indiana University, 1970.) Dis. Abst. Int. 31A: 2712-2713; December 1970.

Teachers in community junior colleges were found to be "exceptionally homogeneous": most have a master's degree from a geographically near college and have considerable teaching experience and interest. University teachers were "very heterogeneous": all three degrees were held, from a variety of institutions; teaching experience was limited, and background was in graduate mathematics rather than education. [s; 34 colleges; college faculty]

Steely, Arthur Watts. Mathematical Concepts in Sociology with Implications for General Education Mathematics. (Auburn University, 1970.) Dis. Abst. Int. 31A: 3793; February 1971.

Five models and a hierarchy of mathematical skills and concepts needed in working with these models were determined. [d; --; college]

Steffani, Ronald Rudolph. Some Effects of Grouping by Subject Matter Major on Student Performances in College Calculus. (Oregon State University, 1970.) Dis. Abst. Int. 31A: 2209; November 1970.

Teaching students in subgroups by academic major appeared effective. [e; 88 students; college]

Steinberg, Seymour. An Investigation of the Effects of Vitamin $B_{12}$ on Mathematics Learning. (New York University, 1968.) Dis. Abst. Int. 30A: 75-76; July 1969.

Stellar, Richard Henry. Emotional Development and Intelligence: Relation to Behavior Modification to Teach Time-Telling to a Population of Mildly Retarded Adolescents. (Boston University School of Education, 1974.) Dis. Abst. Int. 35A: 3557; December 1974.

No significant difference in time-telling scores was found between groups given or not given money and verbal reinforcement. [e; 61 adults; adult EMRs]

Stephens, Harold William. An Undergraduate Mathematics Program for Prospective Teachers of Secondary School Mathematics. (Columbia University, 1964.) Dis. Abst. 26: 215-216; July 1965.

Stewart, Ruth Carol. Realism and the Mathematics Curriculum. (Rutgers - The State University, 1969.) Dis. Abst. Int. 30A: 3865; March 1970.

Materials were developed for a mathematics course based on the philosophy of realism. [d; --; college]

Stiles, Frederick Arthur. An Analysis of Two Approaches to the Teaching of Mathematics Courses for Prospective Teachers. (The University of Texas at Austin, 1971.) Dis. Abst. Int. 32A: 6113; May 1972.

Arguments for the use of a Socratic approach rather than the current (lecture) approach are presented. [d; --; elementary and secondary pre-service]

Stimmel, David Theron. The Effects of Past Experience Upon a Problem-Solving Task Requiring the Use of Heuristic Procedures. (The University of Michigan, 1963.) Dis. Abst. 24: 1715; October 1963.

Stipanowich, Joseph Jean. The Development and Appraisal of a Course in Basic Mathematics for Prospective Elementary-School Teachers. (Northwestern University, 1956.) Dis. Abst. 17: 2531; November 1957.

Stock, Suzanne Jane Foster. A Comparison of an Abstract Deductive and a Concrete Inductive Approach to Teaching the Concepts of Limits, Derivatives, and Continuity in a Freshman Calculus Course. (The Ohio State University, 1971.) Dis. Abst. Int. 32A: 2539-2540; November 1971.

No significant differences were found between groups taught by a deductive or inductive approach. [e; 10 classes (256 students); 13]

Stokes, Hester Christine Boyd. A Follow-Up Study of the Participants of the National Science Foundation Student Science Training Programs in Mathematics at the University of Mississippi, 1967-1969, and at Jackson State College in 1967. (The University of Mississippi, 1970.) Dis. Abst. Int. 31B: 5500-5501; March 1971.

Students in the NSF program scored higher than a norm group. [s; 98 students; college]

Stokes, Joseph Franklin. A Comparative Study of Traditional and Individualized Instruction in Trigonometry at the College Level. (George Peabody College for Teachers, 1972.) Dis. Abst. Int. 33B: 1679-1680; October 1972.

The lecture-discussion method was found to be significantly better than the lecture method, but no significant differences were found with an individualized method. [e; 60 students; college]

Stone, Doyle B. Condensation of Data for Counseling College Freshmen Concerning Initial Placement Into Freshman Courses of Mathematics. (The University of Tulsa, 1974.) Dis. Abst. Int. 35A: 1434; September 1974.

Equations were determined which classified students into appropriate mathematics sequences. [r; 510 students; 13]

Stone, Solomon. The Contribution of Intelligence, Interests, Temperament and Certain Personality Veriebles to Academic Achievement in a Physical Science and Mathematics Curriculum. (New York University, 1957.) Dis. Abst. 18: 669-670; February 1958.

Stone, William C. The Preparation of College Instructors of Mathematics. (University of Chicago, 1952.)

Stoneking, Lewis William. Factors Contributing to Understanding of Selected Basic Arithmetical Principles and Generalizations. (Indiana University, 1960.) Dis. Abst. 21: 2734-2735; March 1961.

Strain, Lucille Brewton. Prospective Elementary-School Teachers' Knowledge of Selected Subject Matter. (The Ohio State University, 1965.) Dis. Abst. 26: 1502-1503; September 1965.

Stuessy, Eugene L. An Experiment to Evaluate the Relative Effectiveness of Two Approaches to Teaching College Algebra in Achieving Selected Objectives of College Algebra in Industrial Technology Curricula. (Texas A & M University, 1969.) Dis. Abst. Int. 30A: 4698; May 1970.

The traditional approach was more effective in developing ability with proofs, while an approach emphasizing applications was better on work with derivations. [e; 66 students; 13]

Stumpff, Howard Keith. The Nature and Levels of Rigor in the Teaching of College Calculus. (University of Kansas, 1968.) Dis. Abst. Int. 30A: 226; July 1969.

Sueltz, Ben A. The Status of Teachers of Secondary Mathematics in the United States. (Columbia University, 1934.)

Summers, Wesley Kenton. Differential Prediction of Academic Achievement with Implications for the Evaluation of the High School College-Preparatory Program. (Texas A & M University, 1967.) Dis. Abst. 28A: 473; August 1967.

Sutton, Louise Nixon. Concept Learning in Trigonometry and Analytic Geometry at the College Level: A Comparative Study of Two Methods of Teaching Trigonometry and Analytic Geometry at the College Level. (New York University, 1962.) Dis. Abst. 24: 654-655; August 1963.

Sutton, Richard H. Remedial Mathematics Programs in Four Selected Junior Colleges in Southern Illinois. (Southern Illinois University, 1970.) Dis. Abst. Int. 31A: 3845-3846; February 1971.

No major background differences in remedial and non-remedial students were identified; remedial students had inadequate high-school preparation. Remedial courses were insufficiently individualized. [s; 90 students; junior college]

Swadener, Marc. National Science Foundation Summer Institute in Mathematics at Indiana University, 1957 Through 1969. (Indiana University, 1970.) Dis. Abst. Int. 31A: 2779; December 1970.

Pre-1963 participants had a higher regard for lectures and discussion leaders and were more involved than previously in leadership activities than were later participants. Participants were less mobile within and across schools than mathematics teachers in general. Fewer than one-fifth completed four sessions. [f; --; secondary in-service]

Swanson, Richard Eugene. Externally Paced Testing: A New Approach to Measuring Externally Paced Programed Instruction. (Boston University School of Education, 1973.) Dis. Abst. Int. 34A: 1717; October 1973.

No significant differences in achievement were found when pacing was controlled by student or teacher, but an average pacing rate on tests was found to be more effective than other paces. [e; 3 groups; 13]

Sweetser, Evan Alton. A Descriptive Case Study of an Elementary Teacher Education Program of Science, Mathematics, and Reading for Experienced Teachers. (Michigan State University, 1969.) Dis. Abst. Int. 30A: 2409; December 1969.

Switzer, Calvinia. Differences in Verbal Responses (Paradigmatic-Syntagmatic) Among Junior College Freshmen. (University of Southern Mississippi, 1971.) Dis. Abst. Int. 32A: 4851; March 1972.

Students who scored similarly on reading and mathematics measures appeared to be paradigmatic responders. [s; 90 students; 13 (junior college)]

Taylor, Washington Theophilus. A Cross Sectional Study of the Modification of Attitudes of Selected Prospective Elementary School Teachers Toward Mathematics. (Oklahoma State University, 1969.) Dis. Abst. Int. 31A: 4024; February 1971.

Courses and the amount of use of mathematics had a significant effect on students' attitudes. [f; 279 students; elementary pre-service]

Temple, Austin Limiel, Jr. The Effectiveness of Semantic Differential Forms in Measuring Attitudes of Prospective Elementary School Teachers. (George Peabody College for Teachers, 1971.) Dis. Abst. Int. 32B: 4091-4092; January 1972.

The Dutton and the Aiken-Dreger attitude scales were both found to be significant predictors of achievement; the semantic differential instrument was not found to be a good predictor. [r; 93 students; elementary pre-service]

Thatcher, Dwain LeRoy. A Comparative Study of Conventional, Tape-Slide-Worksheet and Modified Tape-Slide-Worksheet Instruction in Junior College Developmental Mathematics. (Brigham Young University, 1972.) Dis. Abst. Int. 33A: 2625; December 1972.

No significant differences in achievement were found between the two procedures. [e; 82 students (9 classes); junior college]

Theil, Edward Hiram. Structure and Strategy: The Development of a Course in Mathematical Physics. (University of California, Berkeley, 1972.) Dis. Abst. Int. 35A: 2798; November 1974.

The structure of the mathematical ideas was discussed, as well as trial use of the materials. [d; --; college]

Thesing, Gary Lee. Some Computer Oriented Materials for Use in Elementary Calculus and an Experiment with Their Use. (Oklahoma State University, 1971.) Dis. Abst. Int. 33A: 634; August 1972.

No significant difference in achievement was found between groups where the computer was or was not used. [e; 1 class; college]

Thomas, Darryl William. Mathematical Competencies of High School Mathematics Teachers in Selected Utah School Districts. (Brigham Young University, 1974.) Dis. Abst. Int. 35A: 2663; November 1974.

Teachers who scored higher on a test of high school mathematics had 45 or more quarter hours of mathematics courses and/or graduated from private institutions. [r, s; --; secondery in-service]

Thompson, Paul Edward. Development of a Mathematical Model for Undergraduate Mathematics Curriculum Decision-Making. (Texas Technological College, 1968.) Dis. Abst. 29A: 1812; December 1968.

Thoyre, Henry Howard. A Pilot Study on the Use of Small-Group Discussion in a Mathematics Course for Preservice Elementary School Teachers. (The University of Wisconsin, 1970.) Dis. Abst. Int. 31A: 5258-5259; April 1971.

The course in which small-group work was substituted for part of the lecture discussion did not result in significantly different scores, although they tended to be higher. [e; 2 classes (50 students); elementary pre-service]

Tillotson, Donald Bearse. The Relationship of an Introductory Study of Calculus in High School to Achievement in a University Calculus Course. (University of Kansas, 1962.) Dis. Abst. 24: 577-578; August 1963.

Tinea, Edward Nicholas. The Effects of Comparable Learning Styles of Teachers and Students on Instructional Outcomes. (Saint Louis University, 1973.) Dis. Abst. Int. 34A: 5809-5810; March 1974.

Students with a scanning learning style achieved significantly below those with a focusing style in mathematics. Mathematics teachers tended to have a focusing style. [r; 204 students; 11, teachers]

Tisdale, Joseph Christopher, III. Prediction of Success in First-Year Community College Mathematics. (University of Virginia, 1971.) Dis. Abst. Int. 32A: 4385; February 1972.

Equations to predict success in the first mathematics course were developed. [r; 3 colleges; 13 (community college)]

Todd, Robert Marion. A Course in Mathematics for In-Service Teachers: Its Effect on Teachers' Understandings and Attitudes. (University of Virginia, 1965.) Dis. Abst. 26: 5898-5899; April 1966.

Townsend, Jerry Sue. A Study of a Classroom Strategy for Teaching Mathematics Which Incorporates in an Unorthodox Manner Certain Principles of Programed Instruction. (The Florida State University, 1967.) Dis. Abst. 28A: 3540; March 1968.

Townsend, Neal Russell. The Relationship of Frequency of Tests and Delay of Feedback of Test Results to Achievement in First Quarter Analytic Geometry and Calculus. (Purdue University, 1972.) Dis. Abst. Int. 33A: 2826-2827; December 1972.

Classes receiving daily quisses achieved significantly higher scores on the final test than classes having only a midterm test. Three-day delay of feedback was better than one-day delay. [e; 442 students; college]

Trine, Franklin Dawson. A Study to Determine the Differences in the Ability of Candidates for Elementary Teacher Certificates to Recognize Three Key Properties of Simple Mathematical Syatems. (The University of Wisconsin, 1965.) Dis. Abst. 26: 5275; March 1966.

Tripp, Laurence Irving. Toward a Theory of Sequencing: Study 3-4: An Exploration of Specific Transfer Properties of Different Instructional Sequences Designed for Use in Teaching Selected Principles of Conditional Logic. (The Pennsylvania State University, 1974.) Dis. Abst. Int. 35A: 1436; September 1974.

About the same proportion of students could demonstrate mastery of the principles of conversion and inversion even though they had no instruction on inversion. Familiar and suggestive content appeared equally difficult for contraposition and conversion, though transitive suggestive items were easier. [a; —; elementary pre-service]

Truesdell, Albert B. A Study of the Differential Prediction of Community College Grade Point Average. (Western Michigan University, 1972.) Dis. Abst. Int. 33A: 2725-2726; December 1972.

ACT Mathematics score was the least accurate predictor of success following delay in entering college after high school. [r; 441 students; college]

Tunis, Harry Brandriff. The Effects of Differential Rehearsal and Presentation Treatments on the Performance of a Mathematical Algorithm. (University of Maryland, 1973.) Dis. Abst. Int. 34A: 4093; January 1974.

A rehearsal strategy that did not involve grouping of the algorithm (for finding the area of a triangle) was superior to strategies in which rehearsal steps were grouped. [e; 126 students; elementary pre-service]

Turner, Veras Dean. Prediction of Success as a Mathematics Major at the Minnesota State Colleges. (The University of Oklahoma, 1968.) Dis. Abst. 29A: 2099; January 1969.

Tuscher, Melvin Felix. A Proposed Model for Predicting Success in a First Course of College Calculus in the Community Junior College. (University of Southern California, 1972.) Dis. Abst. Int. 33A: 1468-1469; October 1972.

The single most important predictor was mathematics ability. [r; 111 students; (community, junior) college]

Ulman, Jerome David. Collective Versus Individual Monetary Reinforcement of Arithmetic Performance in a Special Education Class of Retarded Adults. (Southern Illinois University, 1972.) Dis. Abst. Int. 33A: 4958-4959; March 1973.

Arithmetic accuracy was generally higher when individuals, rather than the group, received reinforcement. [e; 6 adults; adult]

Underkoffler, Milton Monroe. Computer Assisted Instruction in College General Education Mathematics. (Iowa State University, 1969.) Dis. Abst. Int. 30A: 4700; May 1970.

The classes in which the computer was used to score and provide immediate feedback on weekly exercises scored significantly higher than classes in which scoring time took a week. [e; 6 classes; college]

Urban, John David, Jr. The Design and Evaluation of an Undergraduate Mathematics Course Incorporating Team Teaching, Individualized Instruction, and Team Supervision. (University of Pittsburgh, 1971.) Dis. Abst. Int. 32A: 6301; May 1972.

Students having the individualized approach had significantly higher achievement than those having lecture or lecture-discussion approaches. [e; 135 students; 13]

Ussery, Allean McKnight. An Experimental Study of Two Instructional Methods Which Compare Student Responsibility in the Learning of College Algebra. (George Peabody College for Teachers, 1973.) Dis. Abst. Int. 34A: 4094; January 1974.

No significant differences in achievement were found between groups using lecture-discussion or a student-centered approach, with or without the option of attendance. [e; --; junior college]

Valsame, James. A Study of Selected Aspects of Mathematics Teacher Training in North Carolina as Related to Recent Trends in Mathematics Teaching. (The University of North Carolina, 1961.) Dis. Abst. 23: 549; August 1962.

Vanaman, Sherman Benton. Toward a Theory of Teaching with Special Reference to the Acquisition of Behaviors of a Mathematical Nature. (University of Maryland, 1967.) Dis. Abst. 28A: 3577; March 1968.

Van Dam, Robert Harold. Programmed Lecturer as a Means of Increasing Student Achievement and Involvement in Large Classes in Liberal Education Mathematics Courses. (The Florida State University, 1967.) Dis. Abst. 29A: 522-523; August 1968.

Van de Walle, John Arthur. Attitudes and Perceptions of Elementary Mathematics Possessed by Third and Sixth Grade Teachers as Related to Student Attitude and Achievement in Mathematics. (The Ohio State University, 1972.) Dis. Abst. Int. 33A: 4254-4255; February 1973.

At third grade level, teachers' informal perceptions of mathematics and positive attitudes were associated with student comprehension; informal perceptions and negative attitudes were associated with student computation ability. No significant differences were found in grade 6. [s; 122 teachers, 113 classes (3100 pupils); teachers in grades 3, 6]

Van Druff, John Courtney. Prediction of Success of Community College Students in Calculus in the State of Washington. (Arizona State University, 1973.) Dis. Abst. Int. 34A: 1055; September 1973.

Equations which predicted about 40 per cent of calculus grades were determined. [r; --; community college]

Vannatta, Glen David. Background, Choices, and Opinions of Superior Mathematics Students as a Basis for an Attack of the Scientific Manpower Shortage. (Indiana University, 1957.) Dis. Abst. 17: 2189-2190; October 1957.

Van Woert, Robert Allan. The Qualifications and Assignments of Teachers of English, Mathematics and Science in the High Schools of Idaho, 1966-67. (University of Idaho, 1969.) Dis. Abst. Int. 31A: 670; August 1970.

Mathematics teachers in Idaho were found to be not well trained when compared with standards set by professional groups. They taught more classes than is recommended. [s; --; secondary in-service]

Vervoort, Gerardus. Factors Associated with Instructor Effectiveness in Calculus. (The University of Iowa, 1970.) Dis. Abst. Int. 31A: 4581; March 1971.

No significant differences in instructor effectiveness were found on measures of students' manipulative skills, but some significant differences were found on measures of concepts. [r; students of 73 instructors; college]

Very, Philip Stearns. Quantitative, Verbal, and Reasoning Factors in Mathematical Ability. (The Pennsylvania State University, 1963.) Dis. Abst. 25: 1371; August 1964.

Vinskey, Mildred Louise. A Follow-Up Study on the Implementation of the Recommendations of the Committee on the Undergraduate Program in Mathematics and Other Mathematics Study Groups Within Selected Massachusetts Elementary School Classrooms. (University of Massachusetts, 1970.) Dis. Abst. Int. 31A: 5259; April 1971.

The CUPM recommendation on the real number system was being implemented. Teachers had the conceptual background but lacked sound pedagogical preparation. [s; 200 teachers; elementary and secondary in-service]

Voltz, Ramon John. A Study of a Student Directed Curriculum in Linear Algebra. (University of Pittsburgh, 1970.) Dis. Abst. Int. 32A: 316; July 1971.

Attitudes of students in the student-directed course were more positive than attitudes of those in a regular course. [f; --; college]

Von Kuster, Lee Norman. A Study of Opinions About the Preparation Programs for Secondary School Mathematics Teachers. (University of Montana, 1971.) Dis. Abst. Int. 32A: 3852-3853; January 1972.

Less than half of the Montana teachers surveyed felt highly prepared to teach content skills; less than one-third felt highly prepared to teach applications. Many felt inadequately prepared on other professional tasks. [s; 159 teachers; secondary pre- and in-service]

Von Rosenberg, Mary Edna. The Status of Teachers and Teaching of Secondary School Mathematics in Texas for the Academic Year 1942-1943. (University of Texas, 1943.)

Waggoner, Wilbur. The Relationship of High-School Mathematics to Success in College. (University of Wyoming, 1956.)

Wagner, Byron Mansfield. The Effect of Venn Diagrams as Visual Transformational Mediators on Rule Learning by College Students. (Arizona State University, 1972.) Dis. Abst. Int. 33A: 2778; December 1972.

Use of Venn diagrams facilitated the learning of a new rule in a transfer task. [e; 72 students; college]

Wahlert, Howard Elmer. Elementary Mathematics in Arts Colleges. (Columbia University, 1952.) Dis. Abst. 12: 530; Issue 4, 1952.

Waits, Bert Kerr, II. Relative Effectiveness of Two Television Techniques and One Large Lecture Technique for Teaching Large Enrollment College Mathematics Courses. (The Ohio State University, 1969.) Dis. Abst. Int. 30A: 2918-2919; January 1970.

Students in large lecture groups achieved higher scores than students having televised instruction. [e; 971 students; 13]

Wallace, Samuel Porter. A Study to Determine the Relationship Between and Among Certain Selected Factors and the Student's Ability to Solve Mathematical Problems by the Discovery Method. (Temple University, 1968.) Dis. Abst. 29B: 2129-2130; December 1968.

Walter, John Fenner. The Effect of Programmed Instruction on the Independent Study of Conventional Material: An Independent Study of First-Year Calculus in a Community College Setting. (New York University, 1969.) Dis. Abst. Int. 31A: 1154; September 1970.

Conventional homework was as effective as programmed homework on an immediate posttest; on a retention test, scores of the conventional group exceeded those of the programmed group. [e; --; 13 (community college)]

Walter, Robert Lee. The Effect of the Knowledge of Logic in Proving Mathematical Theorems in the Context of Mathematical Induction. (The Florida State University, 1972.) Dis. Abst. Int. 33A: 2625-2626; December 1972.

Students taught in terms of logic appeared to achieve better on induction than students not having logic. [a; --; college]

Walters, Ada Jane. A Comparison of Pupil Achievement and College Success in Two High School Programs: One Modular and One Traditional. (Duke University, 1972.) Dis. Abst. Int. 33A: 4771; March 1973.

No significant differences in mathematics were found between students having modular or traditional scheduling. [f; 2 groups; 10, 12, college]

Wampler, Joe Forrest. Prediction of Achievement in College Mathematics. (The University of Nebraska, 1967.) Dis. Abst. 28A: 2573; January 1968.

Ward, William Franklin. The Development and Evaluation of a Unit on Sequential Continuity for Advanced High-School Students. (The Florida State University, 1972.) Dis. Abst. Int. 33B: 3798; February 1973.

Twelfth graders achieved as well on the developed unit on functions as did college students. [e; 41 secondary, 22 college students (3 classes); 12, college]

Wardrop, Robert Frear. The Effect of Geometric Enrichment Exercises on the Attitudes Toward Mathematics of Prospective Elementary Teachers. (Indiana University, 1970.) Dis. Abst. Int. 31A: 670; August 1970.

Neither attitude nor achievement was significantly affected by the inclusion of enrichment exercises in the geometry course, regardless of scholastic aptitude. [e; 111 students; elementary pre-service]

Warnke, Erlo Henry. The Effect of Practice in the Fundamental Arithmetic Operations on Teacher-Education Students. (Colorado State College, 1968.) Dis. Abst. 29A: 2596; February 1969.

Washburn, Kenneth Reburn. A Comparative Analysis of the Mathematics Used in Industry by Electronic Technicians Having an Associate Degree. (University of Northern Colorado, 1971.) Dis. Abst. Int. 32A: 2003; October 1971.

Lower-level jobs required the use of basic mathematics; high-level jobs required calculus. The majority of tasks required use of algebraic and trigonometric concepts. [s; 170 adults; adult]

Washburn, Robert Miles. CEMP - A Computer Enriched Mathematics Program. (Cornell University, 1969.) Dis. Abst. Int. 30A: 5179; June 1970.

The writing, execution, and correction of computer programs (using CUPL) was found to strengthen understanding of mathematical concepts and result in a strong positive attitude at each of the grade levels studied. Although high-IQ students tended to derive greater benefit, average and low-IQ students also benefited. [e; 10 classes; 7, 8, 12, 13]

Washinger, Kenneth C. An Attempt to Construct a Predictive Device for Placing Freshman Students Into Calculus at Shippensburg State College. (Rutgers University, The State University of New Jersey, 1973.) Dis. Abst. Int. 34A: 7608-7609; June 1974.

The predictive test was apparently effective. [r; 333 students; 13]

Wassertheil, Sylvia. Human Information Processing in Logical Problem Solving. (New York University, School of Engineering and Science, 1969.) Dis. Abst. Int. 30B: 1701; October 1969.

Watson, Larry Wayne. The Relationship of the Mathematical Course Work of Teachers and the SAT-M Scores of Their Students. (Duke University, 1969.) Dis. Abst. Int. 30A: 2892-2893; January 1970.

No single course or groupings of courses were significant predictors of student achievement, but the number of semester hours of mathematics taken by a teacher and the number of students in grade 12 of his school were significant predictors. [r; 900 students, 138 teachers (28 schools); 9-12, in-service]

Weaver, James Fred. Skill in Subtraction: The Effect of Changing From the Method of Decomposition to the Method of Equal Additions. (Johns Hopkins University, 1952.)

Webber, Frederick Ardell. The Identification and Validation of a Mathematical Hierarchy. (Indiana University, 1971.) Dis. Abst. Int. 32A: 4387; February 1972.

The hierarchy on limits had a high degree of validity for five of seven units. [a; 206 students; college]

Weber, Walter Irving. A Comparative Study of the Effectiveness of Two Methods of Instruction Utilizing Programed Materials in a College Remedial Mathematics Course. (University of Maryland, 1970.) Dis. Abst. Int. 31A: 3911; February 1971.

No significant differences in achievement were found between groups using lecture-discussion or a programmed materials approach. [e; 99 students; college]

Weddle, Edith George. An Appraisal of Selected Aspects of the Teacher Education Program at East Texas State University Based on a Follow-Up Study of Beginning Elementary Teachers. (East Texas State University, 1971.) Dis. Abst. Int. 32A: 5097; March 1972.

One mathematics course was considered adequate. [s; 135 teachers; elementary in-service]

Weiner, Melvin. A Comparison of the Effect of Two Teaching Techniques in Developing the Functional Competence of College Students in a First Semester Course in Mathematics. (New York University, 1961.) Dis. Abst. 22: 4298-4299; June 1962.

Weisman, Gale Leon. Mathematics Activity Learning Material for Prospective Elementary Teachers and a Comparative Study of Its Application. (The University of Toledo, 1972.) Dis. Abst. Int. 33A: 4255-4256; February 1973.

Attitudes became more positive in the group taught by activity learning, but no significant differences in achievement were found between that group and one taught traditionally. [e; 45 students; pre-service]

Wells, Jay Norman. Using Task Analysis to Incorporate Participation Into a Strategy for Effectively Using a Film to Teach the Principle of Mathematical Induction. (The Florida State University, 1968.) Dis. Abst. 29A: 2047-2048; January 1969.

Welna, Cecilia Theresa. A Study of Reasons for Success or Failure in College Mathematics Courses. (The University of Connecticut, 1960.) Dis. Abst. 21: 1811; January 1961.

Wermers, Donald Joseph. A Study of Achievement by Junior College Transfer, Four-Year College Transfer, and Native Juniors as Measured by the CLEP General Examinations. (University of Illinois at Urbana-Champaign, 1971.) Dis. Abst. Int. 32A: 4387-4388; February 1972.

No significant differences in mathematics scores were found between the three types of students. [f; 303 students; 15]

West, Anita S. Wolfe. Development of a Computer-Administered Diagnostic College Placement Test in Mathematics. (University of Denver, 1969.) Dis. Abst. Int. 30B: 5154-5155; May 1970.

The computer-administered test (r = .93) was found to have a correlation of .59 with S.A.T. Math scores and GPA. Diagnosis, instant scoring and reporting of results, and ease of administration and of revision were cited as advantages. [r; 580 students (4 secondary schools, 2 colleges); 12, college]

West, Joseph Floyd. A Study of Inservice Education for Secondary Teachers of Mathematics in Alabama. (University of Alabama, 1971.) Dis. Abst. Int. 32A: 4854; March 1972.

Activities reported to be of significant value were meetings sponsored by mathematical organizations, summer workshops, professional reading, and curriculum experimentation and research. [s; ---; secondary in-service]

West, Tommie Ann. The Construction and Testing of a Model for Prescriptive Remediation of Arithmetic Deficiencies at the College Level. (University of Maryland, 1972.) Dis. Abst. Int. 33A: 6227-6228; May 1973.

No significant difference was found between groups given a diagnosis or given only scores. Use of a diagnostic program appeared effective. [e; 96 students; college]

Wetter, Donald Merlin. An Analysis of the Preparation of Secondary School Teachers of Mathematics with Special Reference to the New Mathematics Programs. (The University of Nebraska Teachers College, 1966.) Dis. Abst. 27A: 1289; November 1966.

Wetzler, Henry George, Jr. Predicting Student Achievement and Satisfaction with the Teacher in College Mathematics in Terms of Previous Students' Satisfaction with the Same Teacher. (The Ohio State University, 1972.) Dis. Abst. Int. 33A: 3977; February 1973.

In about half the cases, satisfaction with instructor could be predicted, but achievement was not predicted by the instrument used. [r; students of 12 instructors; college]

Whelan, James Francis. Correlation of the Professional and Subject Matter Training in the Preparation of Teachers of High School Mathematics. (Ohio State University, 1938.)

Whipkey, Kenneth Lee. A Study of the Interrelationship Between Mathematical Attitude and Mathematical Achievement. (Case Western Reserve University, 1969.) Dis. Abst. Int. 30A: 3808; March 1970.

A small but important relationship between mathematical attitude and athievement was indicated. [r; 175 students; elementary preservice]

Whitaker, Mack L. A Study of Participants in Summer Mathematics Institutes Sponsored by the National Science Foundation. (The Florida State University, 1961.) Dis. Abst. 22: 2712; February 1962.

Whitcraft, Leslie H. Some of the Influences of the Requirements and Examinations of the College Entrance Examination Board on the Mathematics Requirements in the Secondary Schools of the U.S. (Teachers College, Columbia University, 1932.)

White, Charles Colven. The Use of Programed Texts for Remedial Mathematics Instruction in College. (Utah State University, 1969.) Dis. Abst. Int. 30A: 3373; February 1970.

Significant differences favored the students using programmed texts only on a computation test. [e; 131 students; college]

White, James Howard. Individual and Environmental Factors Associated with Freshman Attrition at a Multi-Campus Community College. (The George Washington University, 1971.) Dis. Abst. Int. 32A: 3709; January 1972.

ACT Mathematics scores were found to be related to persistence. [r; 508 students; 13 (community college)]

White, Marjorie Jo Ann. A Study of the Change of Achievement and Attitude Toward Arithmetic by Prospective Elementary School Teachers Under the Conditions of Television. (Wayne State University, 1963.) Dis. Abst. 25: 2302-2303; October 1964.

Whitman, Nancy Chong. The Development of a Test of Conceptual Knowledge Basic to the Teaching of Arithmetic. (University of Illinois, 1961.) Dis. Abst. 22: 3558-3559; April 1962.

Whittington, Russell, Jr. A Study of the Factors Conditioning College Mathematics, 1890-1945. (The University of North Carolina at Chapel Hill, 1967.) Dis. Abst. 28A: 4399-4400; May 1968.

Wick, Marshall Eldon. A Study of the Factors Associated with Achievement in First-Year College Mathematics. (University of Minnesota, 1963.) Dis. Abst. 24: 1891; November 1963.

Wickes, Harry Edgar. Pre-Service Mathematics Preparation of Elementary Teachers: The Relative Effectiveness of Two Programs in Determining Attitudes Toward, and Achievement in, Mathematics. (Colorado State College, 1967.) Dis. Abst. 28A: 2591; January 1968.

Wiersma, William, Jr. A Study of National Science Foundation Institutes: Mathematics Teacher's Reactions to Institute Programs and Effects of These Programs on High School Mathematics Courses. (The University of Wisconsin, 1962.) Dis. Abst. 23: 1239-1240; October 1962.

Wiesen, Richard A. An Investigation of Several Factors Affecting the Learning of Group Properties by Prospective Elementary Teachers. (State University of New York at Buffalo, 1970.) Dis. Abst. Int. 31A: 2239; November 1970.

The effect of Model, Statement Generality, Vocabulary, and Text Orientation on the learning of the identity and inverse axioms was studied. It was concluded that the learning of mathematical concepts must take into account differentiated levels of the learner's cognitive structure, though specific effects were not evident from the study. [e; 170 teachers; elementary pre-service]

Wight, Theodore Alton. An Analysis of the Advanced Placement Program in Mathematics in the State of Utah. (University of Utah, 1969.) Dis. Abst. Int. 30B: 4270-4271; March 1970.

Taking high school calculus was found to be the best predictor of success for first quarter calculus, but one of the worst predictors for success in second and third quarter calculus. [r; --; college]

Williams, Billy Richard. Critical Thinking Ability as Affected by a Unit on Symbolic Logic. (Arizona State University, 1971.) Dis. Abst. Int. 31A: 6434; June 1971.

No significant difference in critical thinking scores was found between groups given or not given a logic unit. [e; 74 students; 13]

Williams, Clive. The Pervasiveness of Cognitive Preferences. (The University of Iowa, 1970.) Dis. Abst. Int. 31A: 4565; March 1971.

An instrument to assess cognitive preferences was developed and tested. [s; 200 students (in mathematics); college]

Williams, Horace Edward. A Study of the Effectiveness of Classroom Teaching Techniques Following a Closed-Circuit Television Presentation in Mathematics. (George Peabody College for Teachers, 1962.) Dis. Abst. 23: 2160-2161; December 1962.

Williams, Ralph Curtis. Teacher Preparation in Mathematical Arithmetic. (University of Southern California, 1966.) Dis. Abst. 27A: 133-134; July 1966.

Williams, Richard Huntington. An Investigation of the Effects of Method of Presentation and Mode of Introduction on the Learning of Topics From Matrix Algebra. (Indiana University, 1964.) Dis. Abst. 25: 6403-6404; May 1965.

Williams, Thomas David. Comparisons of College Dropouts, Returnees, and Graduates on Selected High School Variables. (Washington State University, 1968.) Dis. Abst. 29A: 2972; March 1969.

Williams, Vernon. A Multi-Predictive Measure to Predict Success at Two Levels in Freshman College Mathematics. (Oklahoma State University, 1969.) Dis. Abst. Int. 31A: 4026-4027; February 1971.

A standardized test appeared to be an effective predictor for elementary but not advanced courses. [r; 365 students; 13]

Williamson, James Edward. Present Practices in the Teaching of College Algebra. COSC 12: 152-157; 1950.

Williamson, Robert Gordon. A Theory of Learning and Its Application to a Class in College Mathematics. (University of Maryland, 1956.) Dis. Abst. 16: 2411; December 1956.

Wilson, G. M. A Survey of the Social and Business Usages of Arithmetic. (Columbia University, 1918.)

Wilson, Howard LeRoy. A Follow-Up on the Participants of the Mathematics Academic Year Institutes Held at the University of Illinois. (University of Illinois, 1966.) Dis. Abst. 27A: 2092-2093; January 1967.

Wilson, John Martin, Jr. Post Mathematical Attitudes Among Prospective Elementary Teachers as Predicted by General Mathematics Skills, Modern Mathematics Skills, Modern Mathematics Achievement, and Prior Mathematical Attitudes. (Northern Illinois University, 1973.) Dis. Abst. Int. 34A: 2453; November 1973.

A significant positive relationship was found between "postmathematical" attitudes and both general and modern mathematics skills and achievement, as well as with prior mathematics attitudes. [r; 206 students; elementary pre-service]

Wisnieski, Gerald Joseph. Development and Evaluation of Self-Instructional Mathematics Materials Designed for Students in Educational Statistics. (Iowa State University, 1970.) Dis. Abst. Int. 31A: 6290; June 1971.

Students who had three or more years of mathematics achieved significantly better in statistics than students having less than three years of mathematics. [f; --; college]

Wisthoff, John Louis. Primacy Effects Associated with the Immediate Recall of Serialized Algorithms. (University of Maryland, 1972.) Dis. Abst. Int. 34A: 674; August 1973.

For two of three algorithms (presented in varying order), the last algorithm presented was the one best recalled. [e; 75 students; community college]

Withers, Nathaniel Riddick. A Qualitative Approach to the Study of Ordinary Differential Equations. (Carnegie-Mellon University, 1971.) Dis. Abst. Int. 32B: 2300; October 1971.

Some techniques to be used in determining the essential behavior of solutions of a differential equation are described. [d; --; college]

Withnell, Melvin Cleo. A Comparison of the Mathematical Understandings of Prospective Elementary Teachers in Colleges Having Different Mathematics Requirements. (The University of Michigan, 1967.) Dis. Abst. 28A: 4941; June 1968.

Wladaver, Irwin. The Plane-Trace Vs. the Edge-View System of Teaching Descriptive Geometry. A Classroom Experiment Comparing Their Relative Effectiveness in Learning. (New York University, 1950.) Dis. Abst. 11: 72-74; Issue 1, 1951.

Womack, Elton Lamar. The Educational and Employment Status of Mathematics Teachers Who Graduated From Louisiana Teacher Education Institutions 1965-1969. (The Louisiana State University and Agricultural and Mechanical College, 1972.) Dis. Abst. Int. 33A: 2229-2230; November 1972.

Nearly two-thirds of the teachers teught only mathematics. Algebra was more frequently the full-time assignment than any other mathematics course. [s; 465 teachers; secondary in-service]

Wong, Ruth Eiko Murashige. Status and Direction of Geometry for Teachers. (The University of Michigan, 1968.) Dis. Abst. 29A: 2597-2598; February 1969.

Woodby, Lauren Gayle. A Synthesis and Evaluation of Subject-Matter Topics in Mathematics for General Education. (University of Michigan, 1952.) Dis. Abst. 12: 531; Issue 4, 1952.

Woods, Dale. Topical Content for Certain Fifth-Year Mathematics Courses for Missouri Secondary School Mathematics Teachers. (Oklahoma State University, 1961.) Dis. Abst. 23: 549-550; August 1962.

Woods, Francis Pollard. A Study of Mathematics Education in the Public Secondary Schools of Louisiana. (The Louisiana State University and Agricultural and Mechanical College, 1972.) Dis. Abst. Int. 33A: 6604-6605; June 1973.

Characteristics of teachers and programs were cited. [s; 1517 teachers; secondary in-service]

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Woodward, Ernest Lail. A Comparative Study of Teaching Strategies Involving Advance Organizers and Post Organizers and Discovery and Nondiscovery Techniques Where the Instruction is Mediated by Computer. (The Florida State University, 1966.) Dis. Abst. 27A: 3787-3788; May 1967.

Wooldridge, Elizabeth Taylor. Factorial Study of Changes in Ability Patterns of Students in College Algebra. (The University of Nebraska, 1964.) Dis. Abst. 25: 2867; November 1964.

Woo-Sam, James McDowell. A Study of Selected Factors Related to Teaching Effectiveness of Mathematics Instructors at the College Level. (Purdue University, 1960.) Dis. Abst. 21: 237; July 1960.

Wright, Mary H. Articulation of Mathematics Curricula: A Study of the Articulation Between the Mathematics Curriculum of the Philadelphia High School for Girls and the Mathematics Curricula of Selected Colleges in Which Graduates of This School Enroll. (University of Pennsylvania, 1971.) Dis. Abst. Int. 32A: 6022; May 1972.

Adequacy in college courses appeared related to the mathematics courses taken in high school. [s; 219 students, 225 faculty; 13]

Yabroff, William Wollin. The Comparative Effects of Inductive and Deductive Sequences in Programed Instruction. (Stanford University, 1963.) Dis. Abst. 24: 3214-3215; February 1964.

Yates, Daniel Sherman. The Development and Evaluation of a Text in the Topology of the Plane for Secondary Teachers. (The Florida State University, 1971.) Dis. Abst. Int. 32A: 6279-6280; May 1972.

In general, the developed text was found to be appropriate in teaching topological concepts. [a; 16 students; secondary in-service]

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Yon, John F. The Academic Year Institute for High School Teachers of Science and Mathematics at the Pennsylvania State University During the 1957-58 Term. (The Pennsylvania State University, 1959.) Dis. Abst. 20: 3216; February 1960.

Yonis, Leonard. The Development and Assessment of a Curriculum Unit in Elementary Algebra for Low Achievers at the Community College Level. (Columbia University, 1968.) Dis. Abst. Int. 31B: 2845-2846; November 1970.

The unit, involving use of desk calculators, was found to be effective. [e; —; community, junior college]

Young, Jerry Leroy. Transformations and Isometries: A Unit for Prospective Secondary Mathematics Teachers. (University of Northern Colorado, 1971.) Dis. Abst. Int. 32B: 4095-4096; January 1972.

The developed unit was found to be successful. Attitudes toward geometry were significantly changed by the unit. [a; 1 class; secondary pre-service]

Young, Norman Edmund. Effectiveness of Three Approaches to the Teaching of a Methods Course in Mathematics for Pre-Service Elementary Teachers as Related to Knowledge, Understanding, and Attitude. (Colorado State College, 1968.) Dis. Abst. 29A: 2598; February 1969.

Young, Ralph W. Programs for the Mathematical Education of Prospective Elementary School Teachers in Southern States. (University of Florida, 1951.)

Zahn, Donald Karl. A Study to Evaluate the Effectiveness of Audio-Tutorial, Slide/Tape Instruction Versus the Flowcharted Method of Self-Instruction in Machine Calculation. (University of Montana, 1972.) Dis. Abst. Int. 34A: 127; July 1973.

No significant differences were found between use of a slide/tape program or a flow-charting presentation. [e; 102 students; college]

Zahroon, Fike Amara. A Comparative Study of Two Methods of Teaching College Algebra. (The Ohio State University, 1971.) Dis. Abst. Int. 33B: 338; July 1972.

The tutorial method was found to be better than use of a lecture-discussion method. [e; 148 students; 13]

Zastrow, Marvin C. The Role of Homework in a College Mathematics Course as Related to the Frequency Principle in the Learning Process. (Northwestern University, 1967.) Dis. Abst. 28A: 2153-2154; December 1967.

Zeddies, Melvin Louis. The Effectiveness of a National Science Foundation Institute in Mathematics as Reflected in Teacher and Student Attitudes and Student Achievement. (United States International University, 1972.) Dis. Abst. Int. 33A: 1067-1068; September 1972.

No significant difference was found in the attitudes toward mathematics of teachers who had or had not attended an NSF institute. Attitudes of students of participating teachers were not significantly different, but achievement increased significantly. [s; 20 teachers; secondary in-service]

Zimmerman, Carl L. An Experimental Study of the Effects on Learning and Forgetting When Students Are Informed of Behavior Objectives Before or After a Unit of Study. (University of Maryland, 1972.) Dis. Abst. Int. 33A: 562; August 1972.

No significant difference was found between groups given or not given behavioral objectives before or after brief programmed units. [e; 150 students; college]

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Calhoun, James Reid. An Introduction to Cluster Set Theory. (Oklahoma State University, 1969.) Dis. Abst. Int. 31A: 4000; February 1971.

Carlton, Lucia Virginia. An Analysis of the Educational Concepts of Fourteen Outstanding Mathematicians, 1790-1940, in the Areas of Mental Growth and Development, Creative Thinking, and Symbolism and Meaning. (Northwestern University, 1959.) Dis. Abst. 20: 2131-2132; December 1959.

Gallant, Charles Daniel. Algebraic Structure in Geometry. (University of Illinois at Urbana-Champaign, 1971.) Dis. Abst. Int. 32A: 818; August 1971.

Glabe, Gordon Richard. Indirect Proof in College Mathematics. (The Ohio State University, 1955.) Dis. Abst. 16: 506-507; March 1956.

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Grinstein, Louise Sonia. An Analysis of the Numerical Approximation to Roots of Polynomial Equations. (Columbia University, 1965.) Dis. Abst. 26: 2237; October 1965.

Hammel, Arnold Dean. A Study of Mathematical Induction. (University of Illinois at Urbana-Champaign, 1972.) Dis. Abst. Int. 34B: 763-764; August 1973.

Haas, Earl Earnest, Jr. Some Matric Analogues and Generalizations of Results in Elementary Number Theory. (University of Colorado, 1970.) Dis. Abst. Int. 31A: 4489; March 1971.

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Kramer, Max. Mathematics in Meteorology, with Suggestions for Teachers of Mathematics and Meteorology. (Columbia University, 1950.) Dis. Abst. 10: 70-72; Issue 3, 1950.

MacKinnon, Ronald Joseph. Elementary Approaches to Waring's Problem. (Oklahoma State University, 1970.) Dis. Abst. Int. 31A: 5795; May 1972.

O'Malley, Mary Therese. The Emergence of the Concept of an Abstract Group: An Example for College Teachers of How Mathematics Develops. (Columbia University, 1971.) Dis. Abst. Int. 34B: 2166-2167; November 1973.

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Rockhill, Theron D. The Development of an Individualized Instructional Program in Beginning College Mathematics Utilizing Computer Based Resource Units. (Final report.) June 1971. ERIC: ED 053 966.

Ross, G. Robert, Jr. and Fletcher, Harold J. Some Personality Correlates of Logical Reasoning Ability. (AERA paper.) January 1974. ERIC: ED 090 315.

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Evaluation of EOA Neighborhood Centers, Adult Basic Education, 1965-1966. 1966. ERIC: ED 012 855.

Teaching Machine Study. (Final report.) January 13, 1967. ERIC: ED 019 004.

A Pre-Technical Program for Georgia's Area Vocational-Technical Schools, A Report on a Pilot Program. June 1968. ERIC: ED 021 134.

Evaluation of the Basic Skills Program, Fall Semester, 1967. June 30, 1968. ERIC: ED 022 474.

First-Year, Full-Time Graduate Science Enrollment Continues to Decline. May 25, 1972. ERIC: ED 067 264.

The Prediction of Doctorate Attainment in Psychology, Mathematics and Chemistry. (Preliminary report.) August 1972. ERIC: ED 069 664.

## INDEX: MATHEMATICAL TOPIC

This index is designed to help the user in locating refsrences to desiGnated mathematical topics. It should be noted thet the cross-referencing is not exhaustive: there may be other references which could be pertinent, but which have been omitted due to oversight.

On the next four pages, a summary of the categories is given, followed by the categorization. The references have been grouped by article (art.), dissertetion (dis.), and ERIC document (ERIC).

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ERIC McDermott, 1973

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ERIC Luger, 1974
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art. Hall, J. V., 1953
Schvaneveldt and Staudenmayer, 1970
Wandt and Brown, 1957
Whimbey, Fischof, and Silikowits, 1969

dis. Hall, J. V., 1951

Homework and supervised study

dis. Beers, 1968
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Mulligan, 1960
Schmidt, 1974
Slay, 1972
Walter, 1970
Zastrow, 1967

ERIC Poulsen, 1970

Review

dis. Avenoso, 1971
Clayton, 1974
Flatt, 1966
Geiselmann, 1956
Nixt, 1973

Writing and reading numerals

art. Newland, 1930
North, Grant, and Fleming, 1967
Perry, 1952
Rebert, 1932a
Rebert, 1932b
Terry, 1922
Tinker, 1928
Tinker, 1954
Tinker, 1960

ERIC Chevalier, 1971

Specification of objectives

dis. Allison, 1970
Barberousse, 1967
Basik, 1973
Beamer, 1971
Bolivar, 1972
Carstens, 1972
Cook, J. M., 1970

Specification of objectives (continued)

dis. Drennan, 1972
Eisenberg, 1971
Heintz, 1971
Harding, 1969
McBride, R. B., 1971
Moore, T. R., 1972
Smith, J. M., 1971
Zimmerman, 1972

ERIC Sheldon and Miller, 1973

Attitude, self-concept, and climate

art. Abe, 1966
Adams and Von Brock, 1967
Aichele, 1971
Aiken, 1963
Aiken, 1970a
Aiken, 1970b
Aiken, 1972a
Aiken, 1974
Aiken and Dreger, 1961
Baggaley and Campbell, 1967
Behr, A., 1973
Berdie, 1955
Bowerman, 1973
Christantiello, 1961
Dreger and Aiken, 1957
French, 1965
McCallon and Brown, 1971
Newman et al., 1974
Perry, 1943
Poffenberger and Norton, 1956
Poffenberger and Norton, 1959
Roberts, 1969
Wiersman, 1972
Young, 1932

dis. Abplanalp, 1973
Addleman, 1972
Aiken, 1961
Allen, M., 1972
Ball, 1972
Bottorff, 1974
Bursack, 1969
Collier, 1970
Comley, 1967
Dahlke, 1972
Duncan, 1971
Garner, 1963
Greenfield, 1971
Guth, 1974
Harrington, 1960
Isaac, 1963
Jackson, 1974
Johnson, S. D., 1972
Koch, 1972
Kockler, 1973
Leake, 1970
McBride, 1974
McDermott, L. A., 1958
Nappa, 1972
Nash, 1970
Natkin, 1967
O'Donnell, 1958
Paskin, 1966
Pfetsing, 1973
Singleton, 1972
Vannatta, 1957
Volta, 1971
Wetaler, 1973
Wright, 1972

ERIC Aiken, 1971
Proctor and Wright, 1961
Ranbarger, 1969

International comparisons

art. Brandenburg, 1967
Chen and Chow, 1948
Ciborowski and Cole, 1972
Wiersma, 1967
Wiersman, 1972

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Flores, 1974
Hagaltom, 1973
Hashmi, 1967
Hunyard, 1960
Shouk, 1966

Content organization and inclusion

art.
Ahern, 1942
Beenken et al., 1956
Brown, K., 1950
Brown, R. S., 1963
Buchanan, 1965
Clark, W. H., 1941
Gavurin, 1971
Georgee, 1931 (1932)
Griffin, 1915
Hutchinson, 1941
Kaplan, 1964
Leissa and Fisher, 1960
Long and Herr, 1973
Mires, 1957
Popejoy, 1963
Rasmussen, 1955
Read and Klein, 1955
Richtmeyer, 1938a
Stone, 1931
Thompson and Poe, 1968
Woodby, 1953

die.
Abshire, 1973
Alden, 1974
Allen, F., 1971
Alepaugh, 1966
Ames, 1972
Anderson, J. D., 1971
Annis, 1966
Archer, C. L., 1968
Armstrong, R. O., 1972
Badgley, 1958
Bailey, F. A., 1973
Bair, 1970
Baker, 1969
Banning, 1972
Barberousse, 1967
Becker, 1960
Beninati, 1964
Bents, 1952
Biggs, 1969
Billetain, 1973
Boclair, 1974
Bohigian, 1972
Bolivar, 1972
Bowman, 1959
Brady, 1958
Buchalter, 1969
Buckland, 1954
Burkhart, 1956
Calloway, 1971

dia.
Carstens, 1972
Cavanagh, 1966
Chase, 1966
Clark, M. E., 1963
Clark, M., 1974
Connellan, 1962
Cook, H. L., 1952
Coon, L. A., 1974
Creswell, D. E., 1972
Davidson, 1971
Davis, J. D., 1974
Dolney, 1972
Driscoll, 1970
Ehrenpreis, 1972
Elias, 1972
Farmer, 1971
Fenneman, 1974
Fentress, 1974
Fisher, 1974
Gallion, 1955
Garber, 1972
Goldstein, 1967
Haggard, J. D., 1951
Hamilton, W. W., 1967
Hannelly, 1939
Harshbarger, 1970
Hayes, P. L., 1973
Horton, 1959
Jones, J. A., 1966
Judd, 1970
Kalish, 1974
Kipps, 1966
Kirby, 1964
Koehler, 1952
Kollin, 1971
Koren, 1952
Kosak, 1952
Laffin, 1960
Laughlin, 1969
Leach, M. P., 1973
Leach, M. L. M., 1974
Ledoux, 1974
Lefstad, 1963
Leggette, 1974
Leonhardy, 1950
Lightner, 1968
Lipsey, 1966
Littrell, 1950
Malcolm, 1968
Harding, 1969
McLaughlin, 1953
McNair, 1959
Mendenhall, 1939

Content organization and inclusion (continued)

dis. Mires, 1957
Mitchell, W. M., 1974
Monk, 1953
Monks, 1967
Monroe, 1966
Moore, V. D., 1951
Niman, 1969
Noll, 1967
Perry, Roy, 1972
Picard, 1968
Quinn, 1974
Rector, 1968
Repsher, 1969
Roney, 1965
Rothbart, 1972
Rowe, 1958
Sanchez, 1972
Sandler, 1962
Schaefer, 1967
Schlessinger, 1958
Scott, B. R., 1969
Seber, 1956
Sharrock, 1972
Shipman, 1974
Simpson, 1973
Sloan, 1961
Smith, E. M. R., 1971
Smith, S. D., 1967
Sparks, 1960
Stewart, 1970
Stumpff, 1969
Theil, 1974
Thompson, 1968
Tripp, 1974
Vinskey, 1971
Ward, 1973
Whitcraft, 1932
Williamson, J. E., 1950
Williamson, R. G., 1956
Wisthoff, 1973
Woods, D., 1962
Wooldridge, 1964

ERIC Block, 1968
Friesen, 1974
George, 1968
Lindquist, 1965
Miller, 1970

Quantitative understanding

art. Glennon, 1949a
Wolfe, 1956

dis. Glennon, 1948
(Goldenbaum, 1970)
Osborne, 1956
Stoneking, 1961
Woodby, 1952

Grade placement

art. Alspaugh, 1971
Suppes and Binford, 1965

Time allotment

art. Baum, 1958
Jessup, 1914
Wagner and Jones, 1973

dis. Gabel, 1955
Jones, J. H., 1971
Masanec, 1973
Olsen, 1974
Parkman, 1972

Counting

art. Arnett, 1905
Freeman, 1912
Kline and Anderson, 1926
Pollio and Reinhart, 1970

dis. Fairbank, 1969
Gillman, 1970

## Number properties and relations

art. Freeman, 1912
Summers and Hammond, 1966

dis. Espigh, 1974
Hancock, 1973
Kerah, 1955
Maricle, 1970
Maramore, 1969
Raeihle, 1972

## Whole numbers

art. Coit, 1928
Coit, 1929
Myers and Myers, 1928
Peterson and Aller, 1971
Price, 1963
Smith, J. H., 1921

dis. Brand, 1952
Leach, M. L. M., 1974
Maricle, 1970

ERIC Chevalier, 1971
Deichmann and Beattie, 1972

## Addition

art. Arnett, 1905
Buckingham, 1925
Cole, 1912
Perkman and Groen, 1971
Reed, 1924
Restle, 1970
Thorndike, 1910
Triplett, 1937

dis. McMahan, 1972
Pestrue, 1971
Speidel, 1973

ERIC Gray et al., 1966

## Subtraction

art. Johnson, J. T., 1924
Johnson, J. T., 1931
Parkman and Groen, 1971

dis. Weaver, 1952

## Multiplication

art. Grossnickle, 1936
Kirkpatrick, 1914

## Division

art. Drushel, 1917
Grossnickle, 1934a
Grossnickle, 1934b
Grossnickle, 1935
Grossnickle, 1936

## Fractions

art. Guiler, 1945

dis. Dalrymple, 1934
Leach, M. L. M., 1974
Leonard, 1973

## Decimals

art. Guiler, 1946b
Russell, 1945

Percentage

art. Guiler, 1946a

Measurement

art. Blount, 1967
Chase, 1917
Estes, 1961
Gilliland and Humphreys, 1943
Goldstone, Boardman, and Lhamon, 1958
Pick and Pick, 1967
Rule and Curtis, 1973
Rule, Curtis, and Markley, 1970
Siegel and McBurney, 1970
Wilson, D. W., 1937
Yorke, 1944a
Yorke, 1944b

dis. Daugherty, 1969
Exum, 1972
Fair, 1974
Mermelstein, 1964
Stellar, 1974
Stimmel, 1963

Negative numbers

art. Scandura, Woodward, and Lee, 1967

dis. Barnard, 1973

Geometry in elementary school

art. Estes, 1961
Shepard and Feng, 1972

dis. Banning, 1972
Ferguson, 1973
Gannon, 1973
Grimes, 1971
Kaith, 1971
Kontogiannes, 1974
Martin, B. L., 1969
Moody, 1968
Moon, 1971
Oravets, 1967
Russell, 1973
Schloff, 1973
Tunis, 1974

Sets

art. Gaston and Kolb, 1973
Neimark and Slotnick, 1970

dis. (Calhoun, 1971)
Clark, M., 1974
Jedlicka, 1973
Kontogiannes, 1974
Pavlik, 1968
Smith, J. M., 1971
Wagner, 1972

Logic and proofs

art. Bittinger and Rudolph, 1974
Ciborowski and Cole, 1972
Clark, H. H., 1969
Doasey and Henderson, 1974
Eisenberg and McGinty, 1974
Howell and Melander, 1967
Karplus and Karplus, 1970
Neimark and Slotnick, 1970
Roberge, 1971
Suppes, 1964
Suppes and Binford, 1965

Logic and proofs (continued)

dis. Ackermann, 1972
Anderson, O., 1971
Arnsdorf, 1971
Baker, 1969
Bittinger, 1969
Brockman, 1963
Carlson, F. R., 1971
Clark, M., 1974
Dettmers, 1970
Dodd, 1968
Dolney, 1972
Dossey, 1972
Elder, 1969
Espigh, 1974
Evans, J. L., 1960
Flaherty, 1972
Frazier, 1970
Gerber, 1974
(Glabe, 1956)
Gore, 1970
(Hammel, 1973)
Heisey, 1966
Hesch, 1956
Ikard, 1971
Jensen, R. W., 1967
Jones, R. C., 1972
Kane, 1973
Macey, 1971
McCoy, 1972
McHenty, 1971
Moloney, 1972
Morgan, W. H., 1972
Roethel, 1972
Sher, 1974
Shipman, 1974
Spaulding, 1972
Tripp, 1974
Wagner, 1972
Walter, R. L., 1972
Wassertheil, 1969
Wells, 1969
Williams, B. R., 1971

ERIC Kane, 1972
Moloney, 1972
Ross and Fletcher, 1974
Sowder, 1972

Flowcharts

dis. Atkinson, 1974
Marchand, 1974
Yonis, 1970
Zahn, 1973

The decimal numeration system

dis. Casebeer, 1968
(Grinstein, 1965)
Hamilton, E. W., 1956
Skipper, 1973
Smith, R. F., 1955
(Woodard, 1967)

Rational number system

dis. Abramson, 1969

Real number system

dis. Craven, 1969
Hurd, 1968

Complex numbers

dis. Forrest, 1971

Other numeration systems

art. Lewis and Plath, 1959
Perry, 1952
Pollio and Reinhart, 1970

Other numeration systems (continued)

dis. Armstrong, L. N., 1974
Haukebo, 1967
Hurd, 1968
Joyner, V. G., 1974
Nitsos, 1971
Skipper, 1973
Smith, J. M., 1970
Woodward, 1967

Probability and statistics

art. Austin, 1974
Egan and Greeno, 1973
Mayer, 1974

dis. Austin, 1972
Bara, 1971
Crouthamel, 1970
Duncan, 1971
Maletsky, 1961
McClain, 1971
Nelson, C. V., 1973
Nuhfer, 1971
Osarowski, 1973
Parkinson, 1964
Rector, 1968
Smith, J., 1974

ERIC Mayer, 1974

Functions; graphing; matrices

art. Cronbach, 1943

dis. Caponecchi, 1974
Davis, J. D., 1974
Davis, T. E., 1970
Elias, 1972
Everett, 1973
Gaynor, 1973
Hajek, 1971
(Hasa, 1971)

dis. Ikard, 1971
Kinsey, 1972
Lang, 1974
Larson, G. J., 1972
Lindstrom, 1972
Nelson, C. V., 1973
Reeves, 1970
Stimmel, 1963
Ward, 1973
Williams, R. H., 1965

ERIC Schoen, 1972

Topology

dis. Bennett, 1971
Duncan, 1971
Gannon, 1973
Goldstein, 1967
(Searcy, 1968)

Basic arithmetic procedures in secondary school

dis. Brand, 1952
Daugherty, 1969

General Mathematics course

art. Brandenburg, 1967

Algebra course

art. Arnold, 1931
Coit, 1928
Coit, 1929
Hill, G. E., 1932
Overn, 1937

Algebra course (continued)

dis. Boliver, 1972
Brunner, 1972
Dixon, 1968
Garner, 1963
Howe, 1967
Lazar, 1972
Salhab, 1974
Soeteber, 1970

ERIC Begle, 1972

Geometry course

art. Arnold, 1930
Bassler, 1966
Boyer, 1937
Brant, 1960
Keedy, 1959
Ralya, 1942
Stone, 1931
Wong, 1970
Zerbe, 1930

dis. Alden, 1974
Arnsdorf, 1971
Barbeau, 1969
Berringer, 1971
Boliver, 1972
Christofferson, 1933
(Gallant, 1971)
Howe, 1967
Kidd, 1972
Kozak, 1952
Lott, 1974
Martin, B. L., 1967
McCoy, 1972
McKillip, 1966
Smith, J. L., 1964
Spillane, 1959
Wong, 1969
Yates, 1972
Young, J. L., 1972

Trigonometry course

art. Geer, 1949
Zerbe, 1930

dis. Kozak, 1952
Podbelsek, 1973
Rosenberg, 1955

Calculus course

art. Gavurin, 1971
McKillip, 1966

dis. Brockman, 1963
Kozak, 1952
McKillip, 1966
Tillotson, 1963

Other courses in secondary school

dis. Long, 1969
Spillane, 1959
Woodby, 1952

Other topics

art. Read, 1935

dis. Ackermann, 1972
Berman, 1973
Brunner, 1972
Caruso, 1967
Davis, J. B., 1968
Lashley, 1970
Levine, J. L., 1968
Martin, J. F., 1972
Monks, 1967
Montano Midence, 1974
Moore, H. R., 1974

Other topics (continued)

dis. Myers, R. E., 1972
Rickart, 1974
Rollins, 1973
Rothbart, 1972
Scott, R. O., 1969
Showers, 1974
Smith, J. L., 1964

Pre-calculus course

art. Fujita and O'Reilly, 1970
Pathtel, 1968
Tatham and Tatham, 1971

dis. Abplanalp, 1973
Abramson, 1969
Alexander, 1962
Bair, 1970
Bluman, 1971
Brown, J. C., 1974
Cantor, 1973
Coon, D. T., 1972
Coon, L. A., 1974
Disko, 1974
Epting, 1972
Ernst, 1969
Jick, 1969
Macey, 1971
Mader, 1972
Marchand, 1974
Patterson, 1971
Schoen, 1971
Walter, R. L., 1972

College algebra

art. Bergen, M. C., 1938
Berger, M. L., 1950
Bryson, 1974
Dobyns, 1964
Elliott, 1958
Gaston and Kolb, 1973
Glucksman, 1973

art. Kellems, 1965
Keller, Shreve, and Reamers, 1940
Malthie, Savage, and Wasik, 1974
Marshall, 1939
Merritt, 1974
Miller, G. H., 1958
Nagel, 1967
Popejoy, 1963
Scott and Gill, 1941

dis. Aichele, 1970
Alton, 1966
Armstrong, R. O., 1972
Atkinson, 1974
Avila, 1969
Baley, 1973
Beck, M. C., 1971
Blanton, 1964
Blyth, 1950
Brown, J. C., 1974
Burnham, 1973
Carlson, P. R., 1971
Clucas, 1972
Coon, D. T., 1972
Corkern, 1971
Cunningham, 1973
Daniels, 1970
Dennis, 1972
Dobyns, 1963
Durkee, 1972
Elder, 1969
Elias, 1972
Evans, J. S., 1971
Ewing, 1974
Fuhrer, 1973
Gasaway, 1962
Goodman, 1967
Grasser, 1974
Graybeal, 1959
Harris, 1964
Hayes, D. T., 1972
Heimer, 1963
Hunt, 1973
Kellems, 1965
Key, 1965
Kinsey, 1972
Koehler, 1952
Lawrence, 1967
Lawrisuk, 1973
Little, C. E., 1965
Love, 1970

College algebra (continued)

dis. Malin, 1974
Mason, L. C., 1967
Mazanec, 1973
McBride, C. C., 1974
Merritt, P. W., 1973
Mick, 1973
Micklich, 1970
Mobley, 1971
Moore, H. R., 1974
Oldham, 1973
Paige, 1965
Partin, 1974
Patterson, 1971
Slay, 1972
Stuessy, 1970
Townsend, 1968
Ussery, 1974
Walter, R. L., 1972
(Waltmann, 1971)
Williamson, J. E., 1950
Wooldridge, 1964

ERIC Bannister, 1970
Lind, 1970
Sheldon and Miller, 1973

College intermediate algebra

art. Bartz and Darby, 1966
Elliott, 1958

dis. Arcidiacono, 1971
Chinn, 1973
Henry, 1973
Lawrisuk, 1973
Mazanec, 1973
Moore, F. N., 1970
Nystrom, 1969
Patterson, 1971
Shiflett, 1964
Simmons, 1958
Yeeselman, 1966

ERIC McDermott, 1973

College trigonometry

art. Bailey, 1932
Bergen, M. C., 1939
Maltbie, Savage, and Wasik, 1974
Popejoy, 1963
Wolfe, 1931a
Wolfe, 1956

dis. Allison, 1970
Armstrong, R. O., 1972
Avila, 1969
Bass, 1971
Brown, J. C., 1974
Calauro, 1953
Elias, 1972
Everett, 1973
Fuhrer, 1973
Hansen, D. W., 1972
Hayes, B. T., 1972
Malcolm, 1968
Mick, 1973
Sagan, 1971
Shiflett, 1964
Stokes, 1972
Sutton, L. N., 1963

ERIC Greenberg and Tuckfield, 1973

College calculus

art. Buchanan, 1965
Cummins, 1960
Davis, T. A., 1966
Dyer-Bennett et al., 1958
Francis, 1966
Hennemann and Geiselmann, 1969
Lucas, 1974
McKillip, 1966
Neatrour and Mullenex, 1973
Nott, 1971
Prouse and Turner, 1969
Robinson, W. B., 1970
Silver and Waits, 1973

College calculus (continued)

art. Steffani, 1971
Stockton, 1960
Van Druff, 1974

dis. Anderson, J. D., 1971
Anderson, O., 1971
Armstrong, R. O., 1972
Basil, 1974
Bell, 1970
Bingham, 1973
Bitter, 1971
Brasch, 1972
Burkhart, 1956
Chaney, 1968
Cohen, 1973
Coon, D. T., 1972
Coon, L. H., 1965
Cummins, 1959
Davidson, 1971
DeBoer, 1974
Dolney, 1972
Fiedler, 1969
Francis, 1966
Fry, 1973
Gibb, 1951
Gilbert, 1971
Graham, 1968
Grigsby, 1974
Hansen, D. W., 1972
Hartman, 1970
Hassinger, 1962
Hennemann, 1967
Hickman, 1969
Holden, 1967
Holoien, 1971
Howlett, 1966
Hunt, 1973
Ibraham, 1970
Ikard, 1971
Karantinos, 1973
Kaufman, D. M., 1974
Kuehls, 1972
Lang, 1974
Larsen, C. M., 1961
Larsen, L. M., 1967
Lindstrom, 1972
Lucas, 1972
Ludeman, 1970
Mach, 1964
Matthews, 1974
McBride, R. L., 1972
dis. McCool, 1974
McKillip, 1966
Miller, 1972
Mitchell, M., 1959
Monroe, 1966
Moulton, 1974
Myers, R. E., 1972
Paige, 1965
Paul, 1971
Pavlik, 1968
Picard, 1968
Pocock, 1974
Randall, D. R., 1972
Rice, B. A. P., 1974
Richert, 1973
Robinson, 1969
Roden, 1972
Ronan, 1970
Scannichio, 1969
Schmidt, 1974
Schowangerdt, 1970
Shelton, 1965
Smith, S. A., 1964
Sommers, 1974
Stannard, 1966
Steffani, 1970
Stock, 1971
Stumpff, 1969
Thesing, 1972
Tillotson, 1963
Townsend, N. R., 1972
Tuscher, 1972
Van Druff, 1973
Vervoort, 1971
Walter, 1970
Washinger, 1974
Webber, 1972
Wight, 1970
Zahroon, 1972
Zastrow, 1967

ERIC Bitter and Slaichert, 1970
Kohen, 1974
Rockhill, 1971
Schmidt, 1970

College descriptive geometry

dis. Amthor, 1967
Babcock, 1970
Baugher, 1973
Beck, E. J., 1969
Cossens, 1966
Earle, J. H., 1965
McCage, 1971
Wladaver, 1951

ERIC Stallings, 1968

College analytic geometry

art. Davis, T. A., 1966
Francis, 1966
Popejoy, 1963

dis. Armstrong, R. O., 1972
Cantor, 1973
DeBoer, 1974
Dolney, 1972
Douthitt, 1972
Fiedler, 1969
Francis, 1966
Gary, B. E., 1972
Hajek, 1971
Howlett, 1966
Knights, F. E., 1958
Larsen, L. M., 1967
Lee, 1965
McBride, R. L., 1972
Monroe, 1966
Nixt, 1973
Pettofresso, 1960
Richert, 1973
Schaumberger, 1963
Shelton, 1965
Smith, S. A., 1964
Sutton, L. N., 1963
Townsend, N. R., 1972

College linear algebra

art. Bittinger and Rudolph, 1974

dis. Armstrong, R. O., 1972
Bittinger, 1969
Ducherme, 1974
Volts, 1971

Technical mathematics

dis. Fuhrer, 1973
Kaufman, A., 1962
Kollin, 1971
Marcinowski, 1971
Stallings, 1970

ERIC Doversberger, 1970
Doversberger, 1971

Occupational, vocational-technical mathematics

dis. Bottorff, 1974
Geiselmann, 1956
Hanson, R. A., 1958

Business mathematics

dis. Brady, 1958
Carstens, 1972
Carver, 1970
Chase, 1966
Dickey, 1967
Feldman, 1958
Flatt, 1966
Hall, A. L., 1972
Kipps, 1966
McCready, 1959
McKnight, 1972
Myers, G. G., 1965
Pierce, 1970

Business mathematics (continued)

dis. Quinn, 1974
Scrittorele, 1973
Zahn, 1973

College remedial mathematics

art. Norman, 1973
Ottley, 1968

dis. Aichele, 1970
Arendsen, 1972
Arnsdorf, 1971
Beck, M. C., 1971
Burris, 1972
Clerk, L. M., 1968
Conroy, 1972
Drennen, 1972
Edwards, 1971
Fronaberger, 1951
Greves, 1972
Hunter, 1954
Jones, J. H., 1971
King, C. E., 1959
Klinger, 1974
Norman, 1972
Nott, 1971
Olsen, 1974
O'Regan, 1967
Peppin, 1974
Phillips, J. W. P., 1971
Poege, 1973
Randall, J. D., 1972
Schroeder, 1973
Segalla, 1973
Simpson, 1973
Sutton, R. H., 1971
Weber, W. I., 1971
White, C. C., 1970
Yonie, 1970
Zwick, 1965

ERIC Berger, D., 1971
Block, 1968
Bloomberg, 1971
Conroy, 1971

Adult basic education

dis. Carson, 1971
Mason, 1972
Neppe, 1972

General education

art. Beenken et al., 1956
Woodby, 1953

dis. Mires, 1957
Nazarian, 1967
Roethel, 1972
Schwartzfisher, 1974
Smith, G. J., 1974
Smith, R. F., 1955
Sowell, 1966
Underkoffler, 1970
Van Dam, 1968

ERIC Friesen, 1974

Other college courses

art. Ahmann and Glock, 1959
Aichele, 1971
Bhushan, 1966
Brown, K., 1948
Brown, K., 1950
Northup, Pingry, and Winsor, 1950

dis. (Blum, 1965)
Boclair, 1974
Bradley, 1961
Caponecchi, 1974
Crouch, 1971
Davis, T. E., 1970
Dockweiler, 1971
Dolney, 1972
Driscoll, 1970
Gaynor, 1973

Other college courses (continued)

dis. Hood, 1972
Hunt, 1973
Judd, 1970
Kimes, 1974
Leach, M. P., 1973
McBride, C. C., 1974
Micklich, 1970
Monks, 1967
Mulligan, 1960
Nelson, C. V., 1973
Oliver, 1970
Plachy, 1965
Sher, 1974
Smith, J. M., 1970
Smith, Q. C., 1968
Thatcher, 1972
Waits, 1970
Williams, R. H., 1965
Withers, 1971

Textbooks

ert. Chase, 1917
Filano, 1957
Flanagan, 1969
Hicks, 1968
Zahn, 1972
Zerbe, 1930

dis. Alton, 1966
Benning, 1972
Buchalter, 1969
Calloway, 1971
Cruikshank, 1969
Ducharme, 1974
Ehrenpreis, 1972
Evans, J. S., 1971
Grimes, 1971
Jones, G. L., 1963
Jones, W. C., 1974
Koehler, 1952
Moulton, 1974
Reeves, 1970
Roden, 1972
Yates, 1972

Workbooks, other printed materials

dis. Allison, 1970
Alton, 1966
Dukeshire, 1966
Feldman, 1958

Manipulative devices, games

art. Austin, 1974

dis. Addleman, 1972
Archer, J. A., 1972
Armstrong, L. H., 1974
Austin, 1972
Cantor, 1973
Clark, M., 1974
Fair, 1974
Hoffman, 1973
Joyner, V. G., 1974
McCege, 1971
Skipper, 1973
Smith, G. J., 1974
Weisman, 1973

ERIC Luger, 1974
Scheumburg, 1972

Audio-visual devices

art. Alexander, 1963
Alexander, 1965
Benner and Rogers, 1960
Byrkit, 1971
Dyer-Bennett et al., 1958
Elliott, 1958
Fujita and O'Reilly, 1970
Pethtel, 1968
Williams, 1963

dis. Alexander, 1962
Al-Hadad, 1973
Amthor, 1967
Austin, 1972

Audio-visual devices (continued)

dis. Backens, 1971
Baley, 1973
Basil, 1974
Boyd, 1964
Brown, E. J., 1971
Byrkit, 1968
Carver, 1970
Chase, 1966
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art. Barts and Darby, 1966
Bassler, 1966
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Davis, T. A., 1966
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Doasey and Henderson, 1974
Egan and Greeno, 1973
Hennemann and Geiselmann, 1969
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dis. Arendsen, 1972
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ERIC Bitter and Slaichert, 1970
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art. Hall, K. A., 1974
Riedesel and Suydam, 1967

dis. Armstrong, L. H., 1974
Bishop, 1971
Ibraham, 1970
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ERIC Judd, 1972
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dis. Washburn, R. M., 1970
West, A. S. W., 1970

ERIC Schmidt, 1970

Readability and vocabulary

art. Aiken, 1971a
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Chase, 1917
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Smith, Q. C., 1968
Vinskey, 1971
Whitaker, 1962
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art. Parkman and Groen, 1971
Peterson and Aller, 1971

dis. Burris, 1972
Crouch, 1971
Davis, J. D., 1974
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West, T. A., 1973

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Coit, 1928
Coit, 1929
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Keller, Shreve, and Remmers, 1940
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Northup, Pingry, and Winsor, 1950
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Lazorack, 1974
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dis. West, A. S. W., 1970

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Ottley, 1968
Suppes, 1964
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dis. Baley, 1973
Brock, 1972
Clark, M., 1974
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Groomes, 1972
Hunter, 1954
Landis, 1968
Lazorack, 1974
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Mason, 1972
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Sutton, R. H., 1971
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dis. West, T. A., 1973
White, C. C., 1970
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ERIC Krupka, 1969

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art. Kneita and Creswell, 1969
Merritt, 1974
Miller, G. H., 1958
Miller, W. L., 1974

dis. Ernst, 1969
Phillips, J. W. P., 1971
Yonis, 1970

ERIC Greenberg and Tuckfield, 1973
Schremmer, 1971

Slow learner

art. Schrank, 1969

dis. Berman, 1973
Fronabarger, 1951

Mentally retarded

art. Blount, 1967
Brekke and Williams, 1974
Maltbie, Savage, and Wasik, 1974
Matthews and Folk, 1964
Price, 1963

dis. Fair, 1974
Lepich, 1971

dis. Morley, 1974
Palmer, 1971
Stellar, 1974
Swanson, 1973
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ERIC Matthews, 1974

Tutoring

dis. Agan, 1971
Alton, 1966
Liguori, 1971
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Pacing options

art. Baum, 1958

dis. Brown, J. C., 1974
Coon, L. A., 1974
Cunningham, 1973
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Heimer, 1963
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Enrichment

art. Lewis and Flath, 1959

dis. Addleman, 1972
Atwood, 1959
Kozak, 1952
Matthews, 1974
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art. Lefkowitz, 1971

dis. Coon, L. A., 1974
Crosswhite, 1965
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dis. Abplanalp, 1973
Bailey, W. T., 1971
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Cummins, 1959
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dis. Mader, 1972
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ERIC Bloomberg, 1971
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Dreger and Aiken, 1957
Hedley, 1968
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Horn and Turner, 1974
Martin and Meyers, 1974
Milliken, 1964
Wolf and Weiner, 1972

dis. Brown, J. D., 1971
Butler, 1972
Carlson, S. L., 1971
Carson, 1971
Crouch, 1971
Downs, 1974
Farr, 1969
Finco, 1966
Fronabarger, 1951
Gallagher, 1968
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dis. Hills, B. B., 1961
Korb, 1974
McMahan, 1972
Mein, 1974
Mohr, 1971
Nash, 1970
Natkin, 1967
Nitsos, 1971
O'Neil, H. F., 1970
Pestrue, 1971
Sanders, E. M., 1959
Schwengerdt, 1970
Smotherman, 1951
Steinberg, 1969
Switzer, 1972
White, J. H., 1972
Wisniaski, 1971

ERIC Aiken, 1971
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art. Caldwell and Harnett, 1967
Eels and Fox, 1932
Horn and Turner, 1974
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McKeachie and Lin, 1971
Milton, 1957
Poffenberger and Norton, 1963
Sommer, 1958

dis. Aiken, 1961
Baskin, 1972
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dis. Anderson, T. M., 1959
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Mahaffey, 1969
Mohr, 1971
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ERIC Renbarger, 1969

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art. Berdie, 1955
Davis, W. E. et al., 1970
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Harris and Liguori, 1974
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Robertson, 1943

dis. Allen, M., 1972
Beeson, 1970
Butler, 1972
Corkern, 1971
Durkee, 1972
Fuhrer, 1973
Gary, C. F., 1973
Gasaway, 1962
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Mach, 1964
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Nair, 1950
Nystrom, 1969
Swanson, 1973
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art. Adam and Von Brock, 1967
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dis. Smith, J. K., 1967
Washinger, 1974
West, A. S. W., 1970
Watzler, 1973
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art. Bennett, 1944
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Durflinger, 1956
Geiselmann, 1956
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Kruglak, 1970
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Raiya, 1942
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dis. Asal, 1971
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Curtis, 1956
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Suelts, 1951
Upshall and Masters, 1934
Waits and Elbrink, 1973
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Birkhead, 1974
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art. Suppes and Binford, 1965

dis. Coleman, S. B., 1973
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art. Aiken, 1971a
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dis. Brand, 1952
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art. Abe, 1966
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dis. Stone, S., 1958
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art. Punke, 1939

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art. Baseham, 1962
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Houston and DeVault, 1963
Norris, 1969
Ruddell and Brown, 1964
Schunert, 1951
Shim, 1965
Upshall and Masters, 1934

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Cox, 1970
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ERIC Begle, 1972
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Transfer

art. Grossnickle, 1936
Haslerud and Meyers, 1958
Hendrix, 1947
Roughead and Scandura, 1968

dis. Rice, E. C., 1958
Smith, J. P., 1973

Retention

art. Dahlke, 1974
Harris and Liguori, 1974
Hendrix, 1947
Reed, 1924
Sommer, 1938
Summers and Hammond, 1966
Whimbey, Fischof, and Silikowits, 1969

dis. Celauro, 1953
McBride, R. L., 1972
Price, W. E., 1971

Generalization

art. Hendrix, 1947
Scandura, Woodward, and Lee, 1967

dis. Crowcroft, 1973
Elder, 1969
Guillotte, 1973
Konkle, 1969
Rice, E. C., 1958

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Ausubel, 1960
Egan and Greeno, 1973
Ehrenpreis and Scandura, 1974
Gaston and Kolb, 1973
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Johnson, B., 1938
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Kline and Anderson, 1926
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art. Scandura, 1968
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