



Pre-K–Elementary Dissertations

- Author: Appell, Claudia Jane
- Title: The Effects of the 4MAT System of Instruction on Academic Achievement and Attitude in the Elementary Music Classroom
- School/Degree: University of Oregon/Ed.D.
- Date: 1991
- Abstract: The primary purpose of this study was to evaluate the effects of the 4MAT System of Instruction on student achievement and attitudes. The subjects were fifth grade students who attended schools outlying the metropolitan area of Portland Oregon. Eight teachers were randomly placed in either the 4MAT or textbook group. Four teachers and 87 students were in the textbook and the additional four teachers and 67 students participated in the 4MAT group.
- The 4MAT lessons were based on Bernice McCarthy's eight step instructional model. The textbook lessons were structured as the lessons in the Centennial Edition (1985), Silver Burdett, grade 5, rhythm unit. The eight lessons were taught in nine consecutive instructional sessions. Attitude was measured using an instrument designed by the author.
- The achievement hypothesis was investigated using two group, pretest, posttest experimental design. The results of the pre- and post tests and the attitude survey were analyzed using a t-test with significance established at the .05 level for one-tailed comparisons. The mean difference in achievement scores between the two groups indicated the students in the 4MAT group achieved significantly greater gains than students in the textbook group. There was no significant difference between attitudes in both groups.

Research in Pre-K through 12 School Settings

- Author: Bowers, Patricia Shane
- Title: The Effect of the 4MAT System on Achievement and Attitudes in Science
- School/Degree: The University of North Carolina at Chapel Hill/Ph.D.
- Date: 1987
- Abstract: The purpose of this study was to investigate the effects of the 4MAT instructional system on achievement and attitudes in science. Fifty-four academically gifted sixth grade students in three schools in the Chapel Hill-Carrboro (North Carolina) City Schools were randomly assigned to two groups: a 4MAT Group or a Restricted-Textbook group that utilized only left-hemisphere activities. Both groups were taught a three-hour unit on Newton's First Law of Motion.
- The dependent variables for investigating the effects on achievement were the overall score and the knowledge and critical thinking subscores on an investigator-made achievement test given at the conclusion of the unit of study. Group means were compared using a one-way analysis of variance. Significant differences favoring the 4MAT group were found for overall achievement ($F(1,52) = 6.19, p < .05$) and on critical thinking questions ($F(1,52) = 13.07, p < .001$). No significant differences were found on knowledge-level questions.
- The dependent variables for investigating the instructional effect on attitudes were the ratings on unit-specific statements and statements about science in general. Mean group ratings for each score were compared using a one-way analysis of variance. Significant differences favoring the 4MAT group were found when analyzing the unit-specific statements. Significant differences favoring the Restricted-Textbook group ($F(1,52) = 5.33, p < .05$) were found when analyzing the unit-specific statements. Significant differences favoring the Restricted-Textbook group ($F(1, 52) = 5.33, p < .05$) were found when analyzing the statements about science in general.

Research in Pre-K through 12 School Settings

- Author: Hancock, Carol Wilcox
- Title: Impact of the 4MAT Lesson Planning System on the Number of Times a Teacher was Off-task in a Fifth, Sixth and Seventh Grade Classroom
- School/Degree: Baylor University, Ed.D..
- Date: 2000
- Abstract The primary purpose of this study was to evaluate the effects of the 4MAT Lesson Planning system on the number of times a teacher was off-task in a fifth, sixth or seventh grade classroom. Three classroom teachers, one at each level, were observed over a 20 day period by three trained observers to obtain data describing the actual number of times each teacher was off-task in a 25-minute period. Off-task teacher behavior was defined as any redirection of teacher attention by a student that pulls the teacher's focus from the topic he or she was currently teaching or discussing. The program under review was the 4MAT Lesson Planning System designed by Bernice McCarthy (1980) to reflect current brain theory and research, learning styles, and left and right modalities in a lesson planning system. A review of the current literature revealed that brain research on how students learn, brain hemisphericity, and learning styles contributed to an enhanced view of how learners actually learn. Teacher accountability and student off-task , disruptive behaviors have been areas of great concern in education. Teacher off-task behavior has been tied to student off-task behaviors which consumes teacher time and attention during class. Research demonstrates that student off-task disruptive behavior was reduced when students are actively engaged in lessons. This study demonstrated a reduction in the number of off-task behaviors in the classrooms where the teachers were using the 4MAT System Lesson Planning System. Implications exist for the use of organize, structured lesson plans focused on student engagement .

Research in Pre-K through 12 School Settings

Author: Madsen, Kim Ann, Ed.D.
Title: An Examination of Multiple Intelligences Exhibited by Preschool Children in a Child Care Center
School/Degree: University of Nebraska/Ed.D.
Year: 1996
Abstract: The purpose of this qualitative study was to determine if multiple intelligences were exhibited by preschool children between the ages of two and four while attending a child care center in western Nebraska.

The research goals for this qualitative study were to discover whether preschool children exhibited preferences for multiple intelligences (especially the seven intelligences identified by Howard Gardner) and if those preferences parallel a specific style of learning (especially the 4MAT learning style model developed by Bernice McCarthy).

The qualitative research process involved the following objectives:

1. Examine multiple intelligences through actual observations, videotapes, and interviews while preschool children were actively engaged in a child care center during self-selection time.
2. To analyze the multiple intelligences of preschool children between the ages of two and four, and identify a probable preference in learning style using the 4MAT model.

A total of twelve children between the ages of two and four were selected to make up the population of this study. The grounded theory qualitative analysis involved the collection of data during self-selection time held between 7:15 and 9:00 a.m. in the child care center. All field work and collection of data through character descriptions, videotapes, logs, observations, and interviews took place in the Chadron State College Child Development Center as preschool children were actively engaged in experiences.

In order to develop the researcher's theory that intelligences may be exhibited by preschool children as young as age two, the researcher documented know characteristics of Howard Gardner's multiple intelligences theory that focused on children almost five years old and older. A documentation of Bernice McCarthy's 4MAT learning styles model was also utilized to assist with determining another portion of the researcher's theory that a relationship exists between intelligences and learning style characteristics.

Based on the findings of this study, it was concluded that individual preschool children exhibited characteristics for at least three multiple intelligences that can be interpreted to describe a relationship between individual or personal learning study.

Research in Pre-K through 12 School Settings

Author: Vaughn, Vicki Lynn Fulton
Title: A Comparison of the 4MAT System of Instruction with Two Enrichment Units Based on Bloom's Taxonomy with Gifted Third-Graders in a Pull-Out Program
School/Degree: Purdue University/Ph.D.
Date: 1991

Abstract: Pull-out programs are the most widely used models in gifted education and are viewed to be quite controversial. A meta-analytic review of the literature on pull-out programs yielded significant effect sizes for the variables of achievement, critical and creative thinking. The purpose of this study was to determine if The 4MAT System of Instruction would improve the achievement, retention, and creative products of gifted third-graders in a pull-out program when compared to the traditional method of instruction based on Bloom's Taxonomy.

A quasi-experimental design was used for the 99 third-grade students identified as gifted by their school system. Two units of instruction ("Mysteries of the Deep/Oceanography" and "Hans Christian Andersen and Fairy Tales") were taught by teachers trained in gifted education and The 4MAT System.

Pretests, post tests, and long-range post tests developed for the study were administered for each unit. A repeated design measure analysis of variance found no differences between the 4MAT group and the group receiving the traditional method of instruction on achievement or retention. However, a moderate effect size was found on tested achievement for the Fairy Tale Unit. Student projects were rated by the teachers and final unit products were judged by independent raters in an attempt to measure higher-level thinking (synthesis) and creativity. The 4MAT group scored higher than the controls on the final product. Talent Pool teachers were interviewed and the students were surveyed to determine their instructional preferences. Teachers preferred the traditional method of instruction but noted that 4MAT helped to focus their teaching to the important concepts. Students preferred the units and activities using The 4MAT System.

Although The 4MAT System produced no effect for either achievement or retention, it did appear to influence the factor of creativity in the final student products for the Fairy Tale Unit, and students preferred the units that used this method of instruction. Further research is needed to determine if 4MAT can benefit gifted students in a pull-out program.

Research in Pre-K through 12 School Settings

Author: Wilkerson, Rhonda Morgan
Title: An Evaluation of the Effects of the 4MAT System of Instruction on Academic Achievement and Retention of Learning (Hemisphericity)
School/Degree: The University of North Carolina at Chapel Hill/Ph.D.
Date: 1986

Abstract: The purpose of this study was to evaluate the effects of The 4MAT System, a method designed to address learning styles and hemispheric preferences, on (a) academic achievement and (b) retention of learning. Also examined were (a) students' interest in the content of instruction, science and attitudes toward the unit of study, and (b) teacher perceptions regarding the instructional approaches and student behavior.

The subjects were 50 randomly selected students who attended a public school in the Piedmont region of North Carolina. The students were taught eight one-hour lessons on simple machines. The experimental group was taught using The 4MAT System; the control group was taught using a textbook approach.

After completion of the unit, a two-part achievement test was administered to the two groups. Part A measured achievement classified as knowledge comprehension, application, and analysis; Part B measured achievement classified as synthesis and evaluation. Group means on Part A were compared using a one-factor analysis of variance; significant differences were found favoring the 4MAT group ($F_{1, 44} = 4.06, p < .05$). Student performance on Part B was scored by raters; group means were compared using a one-factor analysis of variance. There were no significant differences between the means on Part B ($p > .05$).

Thirty-five days after the conclusion of the unit, the same form of the test was administered to both groups. Group means on Part A were compared using a one-factor analysis of variance; significant differences were found favoring the 4MAT group ($F_{1, 46} = 10.10, p < .05$). Student performance on Part B was compared using a one-factor analysis of variance; no significant relationship was indicated ($p > .05$).

Students' interest in science and attitudes toward the instructional activities were examined using journals and a questionnaire. An analysis of the data indicated that students in the 4MAT group were more interested in the unit, had a more positive attitude toward the lessons, and demonstrated more on-task behavior than did the students in the textbook group.

Pre-K–Elementary Additional Studies

- Author: Benezra, Susan Horner
- Title: Bernice McCarthy's 4MAT Learning Style Adaptations in Middle School Life Science
- School: Suburban Middle School in St. Louis County, Missouri
- Date: 1985
- Abstract: The purpose of this study was to determine the effect of The 4MAT System on the achievement performance of middle school students. Using seventh grade life science classes in a suburban St. Louis County middle school, the effect of McCarthy's 4MAT System was studied. Comparisons of pre and post achievement scores on a district criterion-reference test indicated improvement in science achievement for all groups. Results of these comparisons also indicate an increase in positive student comments and greater elaboration of projects.

Research in Pre-K through 12 School Settings

- Author: Hinds, Kelly
- Title: The Effects of 4MAT/Talents Unlimited on Students/Achievement and Attitude
- School: Northern State College, Aberdeen, South Dakota
- Date: August, 1992
- Available From: Northern State College, Aberdeen, P O Box 629, So Dakota, 57401
c/o Dr. Jerry Harmon
- Abstract: This Masters Thesis studied the effects of 4MAT/Talents Unlimited on Students' Achievement and Attitude
- Fifty-one fifth grade students were randomly chosen and divided into two groups. One group was taught with a textbook approach, the other with 4MAT. The content was a science unit on energy, taught daily for forty-five minutes over a three week period.
- The results suggest that the 4MAT/Talents Unlimited approach to teaching is an effective instructional model for students. Students taught using the 4MAT approach:
1. showed statistical significance in the area of higher level thinking skills over the control group.
 2. responded more favorably toward the lessons.
- Students preferred higher level thinking skills over textbook knowledge and applications.

Secondary School Dissertations

Author: Jacobsen, Gary-Hans

Title: Incorporating Learning Styles in Mastery Learning Classrooms.

School/Degree: Montana State University/Ed.D

Date: 1986

Abstract: During the first semester of the 1986-87 school year, the researcher conducted an experiment in the Colstrip Public Schools in Colstrip, Montana. The study involved seventh grade students attending the Frank Britton Middle School. The problem of this study was to determine if student achievement could be improved and/or the number of remediations required for mastery reduced by incorporating learning styles into initial instruction in a mastery learning classroom.

Six teachers, representing the subject areas of math, geography, art, industrial arts and language arts were chosen to participate in this study. Each teacher taught an experimental class and a control class. The teachers incorporated learning styles into initial instruction, using Bernice McCarthy's 4MAT System in the experimental group. The control groups were taught initial instruction without learning styles. At the end of the first semester the students were given a CRT achievement test to determine student achievement. The students were also given an attitude instrument to determine if there was a difference in attitude between the experimental and the control groups. The teachers recorded the amount of time taken for initial instruction and the number of remediations required for the students to achieve mastery of the material.

An analysis of variance showed an improvement in achievement in industrial arts, but there was no improvement in achievement in any of the other subject areas. In math, language arts II, art and industrial arts there was a reduction in the number of remediations required for mastery, while in geography and language arts there was no difference in the number of remediations between the experimental and the control group. There was no learning style preference-treatment interaction, nor was there any gender-treatment interaction.

Based on this analysis, the researcher concluded that by incorporating learning styles into initial instruction in mastery learning classrooms, the number of remediations necessary for mastery could be significantly reduced.

Research in Pre-K through 12 School Settings

- Author: Palatto-Fontaine, Debra
- Title: Effects of the 4MAT System of Instruction on the Self-Esteem and Behavior of Ninth Grade Students (4MAT System of Instruction)
- School/Degree: The University of Connecticut/Ph.D.
- Date: 1989
- Abstract: This study evaluated the effects of The 4MAT System of Instruction on self-esteem and behavior in the classroom. The 4MAT System is an instructional model that provides a systematic approach to organizing and delivering instruction that addresses the learning styles and hemispheric preferences of students.
- The 4MAT Model is one way that educators can ensure success in the classroom and raise competencies that will lead to enhanced self-esteem. Also, when students' unique learning characteristics are recognized, it is assumed that a positive self-esteem will be promoted along with minimal behavioral distractions.
- This study utilized a nonequivalent control group design to examine the impact of The 4MAT System on self-esteem and behavior. The subjects were ninth-grade students attending a public high school in Connecticut. Groups were taught an earth science curriculum using different methods of instruction: The 4MAT System and a traditional lecture/textbook approach.
- The Hypothesis pertaining to overall self-esteem was tested using Analysis of Covariance procedures. No significant differences were found after adjusting the group means, thus the null hypothesis was not rejected.
- To test the hypothesis for determining whether the frequency of high, medium, and low ratings for classroom behavior differed between the two groups, a single-sample chi-square test was performed. Analysis revealed significant differences between the groups and the null hypothesis was rejected.
- Qualitative methodology was included in this study to examine four areas of self-esteem. Data were collected through semi-structured interviews. Differences in themes in the academic area of self-esteem were revealed between the two groups.
- This study has significant implications for educators in the areas of curriculum development, staff development, school effectiveness, and multicultural education.
- Recommendations for further research include replication with students in other grade levels, other subject areas, and the use of additional outcome measures.

Research in Pre-K through 12 School Settings

Author: Sanborn, Stephen D.

Title: A Study of the Effects of Cross-Age Tutoring Versus Learning Styles Instruction in a Heterogeneous Classroom of Higher Risk Students

School/Degree: The University of Vermont

Date: 1994

Abstract: The purpose of this study was to examine the effect of different instructional strategies on the performance of higher risk secondary school students. The strategies chosen to be studied were cross-age tutoring, an instructional strategy accomplished outside of the regular classroom and 4MAT learning style instruction in a heterogeneous classroom as part of every day instruction. Students from three sophomore global history classes at a local Vermont high school were used for the study. Tutors were education majors from a local university.

A causal/comparative method of study was chosen to investigate the relationship between instructional strategies and student learning attitudes, study skills and academic achievement. Using student grade point averages, the results of the California Achievement Test and the results of the Learning and Study Strategies Inventory (LASSI) data analysis revealed that cross age tutoring had a positive impact upon information processing skills and one measure of academic achievement. *4MAT learning styles instruction had a positive impact upon ten of the fourteen variables used to measure the success of high risk students.*

Research in Pre-K through 12 School Settings

Author: Susabda, Esther

Title: The Relationship Between Matched/Mismatched Students' Learning Styles To Faculty Teaching Style and Academic Performance in Christian Secondary Schools In Southern California.

School/Degree: Talbot School of Theology, Biola University/Ed.D.

Date: 1992

Order Number: ADG92-24458. 9305.

Abstract: The purpose of this study is to investigate the relationship between students of matched/mismatched learning style and their preferred faculty teaching style with their academic performance among Christian high school students in Southern California. The instruments used were D. Kolb's Learning Style Inventory (LSI) and B. McCarthy's Teaching Style Inventory (TSI).

This study confirmed the findings of the previous studies.

Different students have different abilities and learning styles. Learning style of the average and below average students tended to be more concretely dimensional while superior students tended to be more abstract in their thinking.

The study found that mismatched students with superior academic performance were less dependent on their preferred teaching style than those of matched students with average or below average academic performance. It seemed that superior mismatched students were more independent and able to integrate application and experience by themselves.

Although matched students might adapt to the instructor's teaching style in abstract dimensions, this did not give support to their academic performance. It was indicated that underachievers had different learning style characteristics from those of high achievers. [214 pages]

Research in Pre-K through 12 School Settings

Author: Szewczyk, Lester

Title: Effects of 4MAT, an Experientially-Based Teaching Method Upon Achievement and Selected Attitudinal Factors of High School Geometry Students

School/Degree: Northern Illinois University/Ed.D.

Date: 1987

Abstract: This study considers the following question: What are the effects of 4MAT, an instructional system integrating experience and perceptual preference upon achievement, attitude, and enrollment intention in advanced mathematics courses of students in secondary school geometry classes?

To investigate this question, four intact geometry classes (80 subjects) from a medium-sized high school near Chicago were assigned to one of two groups, experimental or control, and taught for one semester using either 4MAT processes or traditional methods, respectively. The 4MAT System of teaching/learning was developed by Bernice McCarthy based upon prior work by David Kolb and others. Eight hypotheses were developed reflecting the primary variables of method, achievement, attitude and enrollment as well as secondary attributes of genes, brain hemisphericity and learning style classification. Achievement was measured by a teacher-constructed departmental final examination in geometry; attitude was pretested and post-tested by the Mathematics Attitude Inventory (MAI); enrollment was obtained from school records and by personal communication; cerebral hemisphericity reflected scores on Paul Torrance's Style of Learning and Thinking (SOLAT), Youth Form; and learning styles were categorized according to the Learning Style Inventory (LSI) developed by David Kolb.

The quasi-experimental factorial research format primarily incorporated ANOVA with two-way classification. Post hoc comparison testing utilized the Scheffe method. No interactions were noted, but significant main effects indicated that: (1) the experimental group substantially outperformed the control subjects on the second-semester final examination in geometry; (2) there was differential achievement with respect to learning style classification; (3) posttest attitude factor scores were, to some extent, dependent upon treatment group, gender, SOLAT and LSI; and (4) active-processors differed by treatment group in terms of their enrollment patterns.

Research in Pre-K through 12 School Settings

Author: Thompson, Roger-Lee

Title: American Music: A Humanities Teaching Model for the Alternative School With Special Focus on Learning Styles

School/Degree: University of Minnesota/Ph.D.

Date: 1986

Abstract: The purpose of this project was to develop a teaching model for a humanities oriented course in American music. This model was used to teach a course in the Highview Alternative School in the District #281, Robbinsdale, Minnesota Area Schools from March 25 to May 31, 1985. The Bernice McCarthy 4MAT System was used as the pedagogical base.

The goal was to teach the eclectic nature of American music and how events of history affected the evolution of art, music and literature in the United States. Primary influences taught were English through the Pilgrims, Spanish/Mestizo through the Caribbean, and African through the slaves. These influences were traced through history and the course was concluded with students analyzing Twentieth-Century American popular music as to its musical content and historical roots.

The pedagogical basis for the course was The 4MAT System by Bernice McCarthy published in 1980. The book named four learning types called Innovative, Analytical, Common Sense and Dynamic. According to McCarthy, a person must first have a concrete experience followed by reflective observation, abstract conceptualization and active experimentation. The goal was to make learners comfortable at least twenty-five percent of the time.

The course in American music was especially appropriate for students at Highview as it offered them the opportunity to discuss and analyze “their music.” They became adept at recognizing the musical roots of current popular songs and were able to discuss and analyze “their music,” and were able to discuss the musical elements necessary to determine the style and era of a composition. The 4MAT System addressed student needs and helped them work in all learning styles. There was sufficient evidence to support the need for and acceptance of a humanities course in the alternative school.

Research in Pre-K through 12 School Settings

Author: Ursin, Valerie Dee

Title: Effects of the 4MAT System of Instruction on Achievement, Products and Attitudes Toward Science of Ninth-Grade Students

School/Degree: The University of Connecticut

Date: 1995

Abstract: The purpose of this study was to assess the effects of the 4MAT System of Instruction on students' achievement, products and attitudes in science. The 4MAT model (McCarthy, 1987) is an organized method of instruction which recognizes students' learning or cognitive styles. The subjects were 48 students who were randomly assigned from a rural, public high school in Connecticut. The students were taught and advanced Earth Science curriculum for one semester. The experimental group was taught using the 4MAT System; the control group was taught using a textbook.

Quantitative methodology was used in this study. Data were collected and analyzed using Analysis of Covariance and Analysis of Variance to evaluate students' attitude toward science and achievement, respectively. An analysis of variance on the product scores of a valid and reliable product assessment was also performed.

The hypothesis pertaining to students' attitudes toward science was tested using Analysis of Covariance procedures. No significant differences were found, thus the null hypothesis was rejected. However, the experimental group did have positive gains in attitude on the posttest. A two-way Analysis of Variance by sex and class showed no significant differences between males and females in both groups on total attitude score. Therefore, the sub hypothesis was also not rejected.

A t-test revealed no significant differences between groups on achievement scores as measured by a criterion reference test. An Analysis of Covariance procedure showed no significant difference for the groups. Thus, the null hypothesis was not rejected. *However, post achievement means scores indicated that the experimental group scored higher on the posttest. There was a gain score increase of 9.94 points in the mean on the post-test for the experimental group females. Experimental group males had a mean score increase of 6.41 points. A t-test revealed significant differences on the achievement posttests for males and females in the experimental group.*

Analysis of Variance on the product scores for the Student Product Assessment Form for total assessment were also not significant. Therefore, the null hypothesis was not rejected.

Descriptive data tables were constructed to show the preferred learning style of the students in the control and experimental groups. Analysis indicated that 79% of the experimental group students stayed within the same preferred learning style on the posttest as they did on the pretest. The control group had 75% of the students exhibit the same preference on learning on the posttest.

Research in Pre-K through 12 School Settings

Author: Young, Jr., Donald Blakeslee
Title: Administrative Implications of Instructional Strategies and Student Learning Style Preferences on Science Achievement of Seventh Grade Students
School/Degree: University of Hawaii/Ed.D.
Year: 1986

Abstract: This study evaluated the effectiveness of an instructional model derived from the research on learning styles, science curriculum development, and the development of thinking skills that implied that a specific sequence of instructional strategies that included a discrepant event, discussion, experimentation, practice, and application would result in significantly higher achievement among students of all learning styles preferences when compared to traditional science instruction relying primarily on textbook and lecture.

Using an experimental randomized block design, seventh-grade students (125 males and 128 females) were randomly assigned to the two treatments for a total of 24 weeks. Dependent variables included student mastery of science concepts as measured by the Stanford Achievement Test; basic thinking skills as measured by the Comprehensive Test of Basic skills, (CTBS) science test; and creative thinking as measured by the Torrance Tests of Creative Thinking.

Multivariate analyses of covariance were used to examine the dependent variables with treatment, student learning style preference, and sex as independent variables, and CTBS pretest as a covariate. No significant interactions were found. Main effects of learning style and sex were not statistically significant. The main effect of treatment was statistically significant ($p < .001$) affecting a linear combination of dependent variables composed of CTBS, Verbal Originality, and Figural Elaboration.

The study demonstrated that using a variety of instructional strategies in a pre-planned sequence in science significantly affects student achievement of basic thinking skills, verbal creative thinking, and figural creative concepts, regardless of sex, for students of all learning style preference, confirming McCarthy's 4MAT model of teaching hypothesis.

The study has significant implications for school administrators in the areas of staff development, curriculum development, supervision, and evaluation. Recommendations for further research include replication with other students, other grade levels, and other subject areas.

Secondary School Additional Studies

Author: Howard, Shelley

Title: The Art of Teaching Aesthetics

Order Number: AAD13-55825

School/Degree University of Northern Colorado/M.A.

Date: 1993

Abstract: Discipline-based Art Education prescribes aesthetics in an art curriculum to ensure that students obtain knowledge and participate more fully in a complete artistic experience. The purpose of this document is to provide secondary art educators with a structure for using inquiry as a basis for the study and implementation of normative aesthetics in their curriculum. The most important feature is the incorporation of the 4MAT system developed by Dr. Bernice McCarthy as the teaching strategy for the presentation of the topic.

Research in Pre-K through 12 School Settings

Author: Lieberman, Marcus

Title: Report on the Fairfax County Area III 4MAT Geometry Project

School: Fairfax County Public Schools, Fairfax, Va

Date: 1988

Abstract: Students taught with 4MAT showed significantly greater knowledge of middle school and high school geometry, and middle and high school science concepts than comparison groups. Students gave significantly more applications of knowledge learned than comparison groups. Students enjoyed learning the concepts more than comparison groups.

Study available from About Learning, Inc. at our Wauconda office.

Research in Pre-K through 12 School Settings

Author: Lieberman, Marcus

Title: Report on the Fairfax County Area III 4MAT Pre-Algebra Project

School: Fairfax County Public Schools, Fairfax, VA

Date: 1988–89

Abstract: 200 pre-algebra students in an 18-week unit showed statistically significant gains from a comparison group of approximately the same number when taught with 4MAT lessons constructed by teachers who had received 4MAT training. This report is a summary of data analyses performed on measures. Study available from About Learning, Inc. Wauconda office.

Research in Pre-K through 12 School Settings

- Author: Lisoskie, Patricia Smith
- Title: Experimental Teaching of Right and Left Hemisphere Methodology Using Biology as a Content Area (Right Hemisphere)
- School/Degree: Pacific Lutheran University/M.A.
- Date: 1989
- Abstract: A great percent of high school teaching today is through lecture, discussion, and objective testing to the left hemisphere. Research shows, however, that many students are operating at least part of the time in the right hemisphere mode when they process information. In addition to auditory processing, these students need to receive information visually and kinesthetically. This thesis discusses the history and application of right hemisphere teaching methods. The design of an experimental situation for four high school biology classes using Bernice McCarthy's 4MAT System is investigated. This system teaches to the four learning styles in both the right and left brain modes. The result of the investigation shows that students taught with The 4MAT System, when tested objectively, score an average of ten points higher than existing scores. Students subjectively rated the teaching methods better and stated that they enjoyed the subject more.

Research in Pre-K through 12 School Settings

Author: May, Alberta Otis
Title: The Learning Styles, Personality and Temperament Types of Eight and Twelfth-Grade Urban African-American and White Students: A Comparative Study.
School/Degree: Seattle University/Ed.D.
Date: 1991
Order Number: DA9135972

Abstract: This research study sought to determine if there were differences in the learning styles, personality and temperament types of eighth- and twelfth-grade urban African American and caucasian students.

The research methodology included administering the Myers-Briggs Type Indicator (MBTI) and the Murphy-Meisgeier Type Indicator for Children (MMTIC).

One of the major findings of the study was the difference in the sensing-perception (SP) temperament between both eighth- and twelfth-grade African American and caucasian students. For example, for the eighth-grade sample SPs comprised 49.06 percent of the total eighth-grade sample, 100 percent of eighth-grade African American males, 70.59 percent of eighth-grade African American females, 30.77 percent of eighth-grade caucasian males, and 50.00 percent of eighth-grade caucasian females. Conversely, for the twelfth grade sample SPs comprised 25.19 percent of the total twelfth-grade sample, 50 percent of twelfth-grade African American males, 21.95 percent of twelfth-grade African American females, 21.95 percent of twelfth-grade caucasian males, and 22.86 percent of twelfth-grade caucasian females. Statistically significant differences were also found in the SJ and NT temperaments for both the African American and caucasian samples.

The findings from this study lend support to other research on learning styles, personality and temperament types and reaffirms the need for additional research in this area in relation to academic achievement. [253 pages]

Research in Pre-K through 12 School Settings

- Author: McCoun, Paula and Kay Criswell
- Title: Gender Differences in Attitudes, Spatial Visualization Ability, and Learning Styles of Remedial Mathematics Students (Mathematics Attitudes)
- School/Degree: Texas Tech University/Ed.D
- Date: 1993
- Order Number: ADG93-25778. 9311.
- Abstract: A study involving 90 students enrolled in four sections of a remedial mathematics course was conducted to determine if gender differences in the non-remedial and general population also appeared in the remedial mathematics population. Students were administered three instruments: an attitudes survey consisting of four scales of the Fennema-Sherman Mathematics Attitudes Scales, the Differential Aptitudes Test (DAT), Space Relations Subtest, and Kolb's Learning Style Inventory (LSI).
- Two significant gender differences were found: males scored significantly higher on the DAT Space Relations Subtest, and females scored significantly higher on the Reflective Observation mode of Kolb's LSI.
- The suggestion was made that remedial mathematics teachers work to increase students' spatial skills and decrease their dependence on the Reflective Observation mode. [132 pages]

Research in Pre-K through 12 School Settings

Author: Monroe, Mark S.

Title: An Analysis of High School Seniors' Learning Styles as They Relate to Student Achievement and Attrition in the Science Curriculum.

School/Degree: Memphis State University/Ed.D.

Date: 1992

Order Number: ADG92-24283. 9210.

Abstract: Researchers have noticed that students avoid the disciplines of the sciences, both life and physical sciences. This study was designed to ascertain if a relationship existed between science curriculum achievement/choices and the student's preferred learning style. The study addressed two specific relationships. One was the relationship between learning style and achievement in science as measured by scores on the natural science section of the ACT and by the student's cumulative high school science GPA. Also, focus was given to the relationship between the student's learning style and the number of acquired science semester credits. Results from statistical analyses indicated that several learning style groups differed significantly when comparing scores on the natural science section of the ACT. The accommodator group had significantly lower scores than those of the converger group or those of the assimilator group. The same two pairs, accommodator-assimilator and accommodator-converger, had significantly differing means of the number of science credits acquired. Results of the ANOVA did not indicate a significant relationship between the seniors' learning style and their cumulative high school science GPA. Implications for Teacher Education were addressed. Specifically, a continued awareness of learning style theory was felt warranted because students perceive and process information uniquely, applying a specific configuration of tactical problem-solving techniques. Some students, such as those with an accommodator learning style profile were not as science orientated. The use of a deductive instructional approach, as well as the more traditional inductive methodology, was suggested to assist the accommodator group, characteristically deductive learners. Recommendations for further research were listed. [87 pages]