

A STUDY OF THE EFFECT OF SELECTED TEACHING STRATEGIES ON
CREATIVE THINKING ABILITY AND READING COMPREHENSION

THESIS

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Abstract

The purpose of this study was to determine if the creative thinking skills of third and fourth grade students could be enhanced by the use of selected teaching strategies designed to stimulate fluency, flexibility, originality and elaboration. A second purpose was to investigate the relationship between creative thinking and reading.

The subjects were third and fourth graders who were all members of the same racially integrated, homogeneously grouped classroom in an urban elementary school. A control group and a treatment group were formed. Both groups were found to be statistically equivalent in reading ability and creative thinking ability when pretested with the Torrance Test of Creative Thinking (TTCT) and the Metropolitan Achievement Test.

The treatment group participated in three twenty-five minute sessions per week for eight weeks designed to develop the skills of fluent thinking, flexible thinking, original thinking and elaborative thinking. Each lesson began with a relaxed attention activity. The control group received no instruction in creative thinking. They spent a comparable amount of language arts time listening to and reading literature.

At the end of the treatment period, both groups were posttested using the TTCT and the Metropolitan Achievement Test. The posttest results showed no significant differences in creative thinking ability between the treatment group and the control group. A significant correlation was found between reading comprehension and fluency for the treatment group.

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Chapter I

Statement of the Problem

Purpose

The purpose of this study was to determine whether the creative thinking abilities of third and fourth grade students could be enhanced through the use of selected teaching strategies. A second purpose was to investigate the relationship between creative thinking and reading.

Need for the Study

In times of conflict and change, states Skipper (1970), the educational system must help young people realize their full potential as curious, responsive, sensitive, imaginative human beings. Instruction in creative thinking may be one way to accomplish these goals.

Researchers differ in their opinions as to whether creative thinking can be taught. Maslow (1954) holds the view that creativity results from mental health. Therefore, the schools ought to be strengthening the mental health of students. Still others, states Gowan (1977), claim that creativity is nothing more than a psychological openness to preconscious sources.

Torrance (1972) maintains that it is indeed possible to teach children to think creatively. The most successful approaches, he states, seem to be those that involve both cognitive and emotional functioning, provide adequate structure and motivation and give opportunities for involvement, practice and interaction with others.

One of the most plausible analyses of abilities that may contribute specifically to creative behavior is that of Guilford (1962) who identifies the abilities of fluency, flexibility and originality. They may be strengthened, suggests Guilford, by giving students exercises similar to the tests measuring the particular abilities.

In the United States, most creative thinking abilities, as measured by tests, show growth from grades one through three, a sharp decline around the beginning of grade four and another rise during fifth or sixth grade (Torrance, 1969). Studies suggest, Torrance continues, that at least the drop which occurs in fourth grade is man-made, rather than a natural phenomenon.

Dudek (1973) does not believe there is a drop in creativity. She theorizes instead that there is a change in the quality of expressiveness by the eight to nine year old child.

The effectiveness of relaxation training is the subject of current study. Relaxed attention is essential for creative thinking (McKim, 1972).

Little attention has been given to the relationship between creative thinking and reading achievement. An increased awareness of this relationship is needed.

Torrance (1970) maintains that the creative reader, in his search for solutions, is involved in several activities: the production of a larger number of possibilities (fluency); the use of many different approaches or strategies (flexibility); the production of bold new ideas off the beaten path (originality); and the development of an idea, filling out the details, making an idea attractive or embroidering it (elaboration).

Questions to be Answered

The following questions were investigated:

1. Can the creative thinking abilities of third and fourth grade students be enhanced by selected teaching strategies designed to develop fluency, flexibility, originality, and elaboration?
2. Does a significant, positive relationship exist between results on a creative thinking test and a test of reading achievement?

Definition of Terms

The terms which require definition are: fluent thinking, flexible thinking, original thinking, elaborative thinking, attributes, examples of change, organized random search, creative writing skill, visualization skill and evaluation of situations.

Fluent thinking is the ability to think of the most responses (generation of a quantity, flow of thought, number of relevant responses) (Williams, 1970).

Flexible thinking is the ability to take different approaches (variety of ideas, ability to shift categories, detours in direction of thought) (Williams, 1970).

Original thinking is the ability to think in novel or unique ways (unusual responses, clever ideas, production away from the obvious) (Williams, 1970).

Elaborative thinking is the ability to add on to (embellish upon an idea, embroider upon a single idea or response to make it more elegant, stretch or expand upon ideas) (Williams, 1970).

Attributes are inherent properties, conventional symbols or identities, or ascribing qualities (Williams, 1970).

Examples of change activities provide opportunities for making alterations, modifications or substitutions (Williams, 1970).

Organized random search activities require the student to use a familiar structure to build another structure (Williams, 1970).

Creative writing skill activities assist the student in learning the skill of communicating ideas in writing; learning the skill of generating ideas through writing (Williams, 1970).

Visualization skill activities encourage the expression of ideas in visual forms, illustrating thoughts and feelings, describing experiences through illustrations (Williams, 1970).

Evaluation of situations activities require the student to decide upon possibilities by their consequences and implications; to check or verify ideas and guesses against the facts (Williams, 1970).

Limitations of the Study

This study was limited to 27 third and fourth grade students in one urban school district.

The data for this study were limited to results of whole-group testing.

Summary

A need for further study in the area of teaching creative thinking skills has been indicated. Of special concern is the eight to nine year old, as some research indicates a decline in creative

thinking skill at this age. Further studies also need to be conducted to determine the effects of relaxation training with children.

Although some research has been conducted to determine whether there is a relationship between creative thinking and reading, there is a need for further investigation.

This study was designed to determine whether the creative thinking abilities of third and fourth grade students could be enhanced through the use of selected teaching strategies incorporating relaxed attention activities. The relationship between creative thinking and reading was also investigated.

Chapter II

Review of the Literature

Purpose

The purpose of this study was to determine whether the creative thinking abilities of third and fourth grade pupils could be enhanced through the use of selected teaching strategies. A second purpose was to investigate the relationship between creative thinking and reading.

Developing Creative Thinking Skills

Educators have been debating the question of whether creative thinking can be effectively taught. They have disagreed as to whether imaginative ability in problem solving can be deliberately developed through instruction and practice.

Research on the development of creative behavior, states Skipper (1970), has been conducted on an increasing scale since J. P. Guilford, in 1950, pointed out the neglect of the study of creativity.

The first body of research emphasized the identification of creative talent, writes Skipper. This was followed by a concern for experimenting with teaching procedures intended to stimulate students to think independently, test ideas and communicate them to others.

Some researchers, states Gowan (1977), feel that creativity is nothing more than a psychological openness to preconscious sources. Maslow (1954) holds the view that creativity results from mental health.

He believes, therefore, that the schools ought to be strengthening the mental health of students.

Schools should be directing their efforts toward cognitive skills on which a broad spectrum of other potential achievements rests, states Wallach (1973). He maintains that creativity education is a frill. Schools should be emphasizing the teaching of reading. It is not necessary, he asserts, for students to read creatively. It is merely necessary for them, and particularly the low-income child, to learn how to read.

Lytton (1972) maintains that there are two main ways in which a school may hope to enhance children's creative abilities. One is to generate a creative spirit in the school and to adopt an experimental, creative, open-ended approach to learning in each individual field of the ordinary curriculum. What matters here is the way language, math, science, and other subjects are taught and the attitudes teachers adopt towards the process of education.

The other way in which a school may enhance children's creative abilities, continues Lytton, is to introduce special educational experiences for deliberately training creative thinking or problem solving skills as such, unrelated to normal school subjects.

Much research supports the view that creative thinking can and should be taught. It is the belief of these researchers that all normal children, if given a chance, can be creative.

According to Callahan and Renzulli (1977), research has shown that almost all children have the potential to think creatively, and

creative production can be improved by providing children with learning experiences that encourage them to use their imaginations. Studies by Cawley and Chase (1967), Rouse (1965) and Tisdall (1962) have found that children of all ability levels, including mentally retarded, are capable of creative thinking.

In summarizing the results of 133 studies designed to test approaches to teaching children to think creatively, Torrance (1962) maintains it is indeed possible to teach children to think creatively. The most successful approaches, he states, seem to be those that involve both cognitive and emotional functioning, provide adequate structure and motivation, and give opportunities for involvement, practice, and interaction with teachers and other children.

He further states that motivating and facilitating conditions certainly make a difference in creative functioning, but differences seem to be greatest and most predictable when deliberate teaching is involved.

Parnes and Brunerle (1967), in a review of 40 studies evaluating programs for teaching students to improve their fluency, flexibility, originality and elaboration, report that 90% of the total number indicate that the subjects' creative production levels were significantly increased by deliberate educational programs.

The results of Miller's (1975) study of third grade students indicate that lessons designed to train productive thinking skills can be effective. A study by Treffinger and Ripple (1968) shows that gains by fourth graders trained in productive thinking are significantly greater than the control group members.

Torrance (1969) states that from the best research evidence available and observations of many investigators, creative imagination during early childhood seems to reach a peak between four and four and one-half years. This is followed by a drop at about age five when the child enters school for the first time. In the United States, most creative thinking abilities, as measured by tests, show growth from grades one to three, a sharp drop around the beginning of grade four, a rise during fifth and sixth grade and another decline around seventh grade. This drop in creative thinking is not apparent among children of comparable ages in other countries, suggesting that the cause may be cultural and not developmental.

According to Torrance, studies involving deliberate attempts to keep alive creative growth in fourth grade suggest that at least the drop which occurs in fourth grade is man-made rather than a natural phenomenon. It is at this level that teachers are more concerned with content area subjects than are primary level teachers. Changes in methods and expectations are evident. This age level marks a turning point in social relationships. Peer pressure may inhibit creative development. In an effort to combat the fourth grade slump, Torrance and Gupta (1964) used experimental audiotapes to develop creative thinking among fourth graders. Positive results were reported when the subjects were tested with creative assessment devices.

The results of a study by Payne (1974) with fifth and sixth grade black children suggest that divergent thinking as an aspect of creativity can be fostered by the use of appropriate treatment regimes.

To simply encourage children to express themselves freely, states Passow (1977), is not enough. To exercise creativity, the individual must have a base upon which to build knowledge. An openness to experiences, an ability to play with ideas, elements, concepts and relationships, the potential for evaluating internally, are all qualities that must have a sound knowledge base.

Creativity and Relaxed Attention

The importance of relaxation and attention in the creative process has received much attention in recent years.

McKim (1972) maintains that relaxation and attention are mutually supportive. By relaxing unnecessary tension, individuals can release their full energy and attention to the task at hand. Relaxation is important to thinking generally, because individuals think with the whole body and not just their brain.

Relaxed attention, states McKim, is important to creative thinking. While subconscious incubation requires relaxation, without attention a sudden flash of insight is lost. Even more than most human skills, seeing, imagining and drawing require relaxed attention.

Generally, relaxation experts agree that the first step in eliminating excessive muscular tension is for the individual to realize that he is responsible for the excessive tension. The final step is to learn to voluntarily let go of tension.

According to McKim, letting go of neck and shoulder tension is a special problem for people who must do a lot of paper work. For many years, the human neck made possible side-to-side and up-and-down

head movements which were required for hunting and survival. Holding the heavy human head over a desk for long periods while looking rigidly straight ahead at paperwork places an extremely unnatural demand on neck and shoulder muscles. These areas need to be relaxed periodically, and always just before intense visual/mental activity.

The skill of voluntary attention can also be learned maintains McKim. It requires the individual to devote energy, freely and dynamically, to discover more about a single object, idea or activity that interests him.

Frederick (1975) maintains that relaxation training helps the individual learn to relax away needless tension in order that everyday activity might proceed with greater efficiency.

Frey (1980) studied the effects of autogenic relaxation training. Results indicated that children in the treatment group improved in their ability to relax and concentrate which led to greater academic progress.

In Padawer's (1977) study of the reading performance of relaxation trained children, the relaxation trained children demonstrated significantly higher performance on all dependent variables for word recognition and comprehension. They worked with less impulsivity, were more attentive and demonstrated greater flexibility of thought. They exhibited increased concentration and sophistication in problem solving skills.

The favorable results of a study by White (1977) suggest the importance of identifying the appropriate warm-up for the particular

child. It should be suitably timed, content oriented and should challenge the very best contributions the child has to offer.

Torrance (1962) maintains that a child is not likely to produce imaginative ideas in a busy classroom, so the teacher needs to provide periods of quiet and relaxation in order to aid creative thinking.

McKim (1972) asserts that relaxed attention should be taught. He sets forth several techniques for developing relaxed attention. Some of those techniques were employed in this study.

Creativity and Reading Achievement

A review of the literature revealed few references to the relationship of creative thinking skills to other areas of the school curriculum.

According to Dirkes (1977), Guilford maintains that reading depends largely upon the ability to produce transformations. When individuals understand what they read at a glance, they change, or modify what they knew previously. This is called learning. However, many concepts, functions and systems are not understood immediately through cognition. They require divergent and convergent production. Therefore, it is profitable to define learning as a construct which involves more than cognition and memory. Learning includes the divergent production of transformations. The creative factor enables individuals to produce independent responses to problems, challenges and opportunities whether or not they are part of our traditional notions of the academic domain.

It could be argued, contends Dirkes, that all learning, save repetition and simple cognition, is creative. A study of the total creative process discloses functions common to both creativity and learning.

A study by Circirelli (1965) resulted in a significant correlation between creativity and arithmetic achievement scores, but not between creativity and reading achievement. However, Begy and Hicks (1980) reported significant correlations between reading and creativity measures among fourth graders who had participated in eight weeks of creative thinking activities.

Parnes (1967) reviewed several studies in which the creative thinking training was incorporated in a subject-matter course or studied with respect to gains in normal academic areas. No losses were reported in any subject-achievement levels, and one study indicated gains in subject-matter for experimental students over control students, as well as gains in creative productivity.

A study by Veatch, reports Parnes, showed gains in reading when creative activities were part of the training.

The creative reader, in his search for solutions, is involved in several activities: the production of larger numbers of possibilities (fluency); the use of many different approaches or strategies (flexibility); the production of bold new ideas off the beaten path (originality); and the development of an idea, filling out the details, making an idea attractive or embroidering it (elaboration) states Torrance (1970).

Haggard (1977) found that the use of a Creative Thinking-Reading Activities (CT-RA) approach was effective as a means for improving reading comprehension and stimulating creative thinking. CT-RA was thought to serve as a warm-up or catalyst to creative reading.

Further research is needed to explore the relationship between creative thinking and reading comprehension.

Summary

Although there is some research which disagrees, there is much positive research which has shown that creative thinking can and should be taught. Several studies indicate that creative thinking skills can be significantly increased through deliberate instruction.

There is some evidence from research conducted in U.S. schools that a decline occurs in creative thinking ability around the beginning of grade four. Hence, this level needs special attention.

The importance of relaxation and attention in the creative process has received much attention in recent years. Torrance (1962) maintains that teachers need to produce periods of quiet and relaxation in order to aid creative thinking. McKim (1972) claims that relaxed attention should be taught.

Little research has been done to determine the relationship between creative thinking and reading.

Chapter III

The Research Design

Purpose

The purpose of this study was to determine whether the creative thinking abilities of third and fourth grade students could be enhanced through the use of selected teaching strategies.

The researcher also investigated the relationship between creative thinking and reading.

Hypotheses

The following null hypotheses were investigated:

There are no significant differences between the mean posttest scores of the control group and the treatment group on the Torrance Test of Creative Thinking (TTCT) following an eight week program incorporating selected teaching strategies.

There is no significant correlation between the posttest scores on the TTCT and the Metropolitan Achievement Test for the treatment group.

Methodology

Subjects

The treatment group consisted of six third graders and eight fourth graders. The control group consisted of nine third graders

and four fourth graders. They were all members of the same racially-integrated, homogeneously grouped classroom in an urban elementary school.

The average grade equivalent score for reading comprehension for each group on the Metropolitan Achievement Test in October 1979 was 6.2.

Instruments and Procedures

The Torrance Test of Creative Thinking - Verbal Form A was administered as both a pre- and posttest. The researcher administered both tests to the total group. Scores were obtained for fluency, flexibility, originality and elaboration.

The treatment group participated in three twenty-five minute sessions per week for eight weeks to develop skills in fluent thinking, flexible thinking, original thinking and elaborative thinking.

Six lessons, developed by Williams (1970), were presented for each of the four behaviors. Six teaching strategies, a different one for each lesson, were employed: attributes, examples of change, organized random search, creative writing skill, visualization skill and evaluation of situations.

Each lesson began with a relaxed attention activity designed by McKim (1972). Lesson plans are included in the Appendix.

The control group received no instruction in creative thinking skills. They spent a comparable amount of language arts time listening to and reading literature.

Both groups were also pre- and posttested using the Metropolitan Achievement Test Form JS to obtain a reading level for each subject.

Third graders were tested with the Primary II Level and fourth graders with the Elementary Level. A total comprehension score was obtained.

Statistical Analysis

The data were analyzed by comparing the mean posttest scores of the Torrance Test of Creative Thinking using a t test for independent means.

Spearman rho correlations were established between reading and creative thinking ability.

Summary

This study investigated whether the creative thinking abilities of third and fourth grade students could be enhanced by the use of selected teaching strategies. The Torrance Test of Creative Thinking was administered to assess the subjects' creative thinking abilities. Scores were obtained in fluency, flexibility, originality and elaboration. Students participated in activities designed to improve their creative thinking skills during an eight week program. The lessons were designed by Williams (1970). Each lesson began with a relaxed attention activity developed by McKim (1972). The data were analyzed by comparing the mean scores of the posttest using a t test for independent means. Correlations were established between reading achievement and creative thinking ability.

Chapter IV

Analysis of Data

Purpose

The purpose of this study was to determine whether the creative thinking abilities of third and fourth grade pupils could be enhanced through the use of selected teaching strategies.

A second purpose was to investigate the relationship between creative thinking and reading.

Findings and Interpretation of Data

The first null hypothesis in this study was:

There are no significant differences between the mean posttest scores of the control group and the treatment group on the Torrance Test of Creative Thinking (TTCT) following an eight week program incorporating selected teaching strategies.

Following the eight week treatment program, a t test for independent means was used to compare the mean posttest scores of the treatment group and the control group on the TTCT in the areas of fluency, flexibility, originality and elaboration.

Analysis of the data in Table 1 resulted in failure to reject the first null hypothesis. There were no significant differences between the mean posttest scores.

Table 1.

t test of Differences of Posttest Scores on Four Variables
of Creativity for the Treatment and the Control Groups

	Control		Experimental		derived <u>t</u> ratio
	Mean	s.d.	Mean	s.d.	
Fluency	66.62	19.47	63.43	19.39	.411
Flexibility	28.62	7.16	28.00	7.30	.214
Originality	58.77	23.30	57.00	36.30	.162
Elaboration	4.69	2.55	4.21	2.70	.436

critical t (25), $p < .05 = 2.06$

The second null hypothesis in this study was:

There is no significant correlation between the posttest scores on the TTCT and the Metropolitan Achievement Test for the treatment group.

Following the eight week program, the second hypothesis was tested by rank-difference correlation.

Analysis of the data in Table 2 resulted in a significant correlation between fluency and reading comprehension following the creative thinking treatment program ($p < .05$). There were no significant correlations between reading comprehension and flexibility, originality, and elaboration.

Table 2

Correlations Between Reading Achievement and Four Creativity
Variables on Posttest of Treatment Group

Creativity Variables	Correlations
Fluency	.590*
Flexibility	.515
Originality	.494
Elaboration	.075

*critical Spearman rho (14), $p < .05 = .544$

Summary

The findings of this study failed to reject the first null hypothesis. There were no significant differences between the mean posttest scores of the TTCT for the control group and the treatment group.

A significant correlation between reading comprehension and fluency was established. Significant correlations between reading comprehension and flexibility, originality, and elaboration were not established.

Chapter V

Conclusions and Implications

Purpose

The purpose of this study was to determine whether the creative thinking abilities of third and fourth grade students could be enhanced through the use of selected teaching strategies.

A second purpose was to investigate the relationship between creative thinking and reading.

Conclusions

The results of this study failed to reject the first null hypothesis that there would be no significant differences between the posttest scores of the Torrance Test of Creative Thinking (TTCT) for the control and treatment groups. The findings failed to show that the eight week program incorporating selected teaching strategies was effective in enhancing the creative thinking abilities of third and fourth grade students.

The results may be due to the length of treatment which was three twenty-five minute sessions per week for eight weeks. Also, this study did not take into consideration a measure of intelligence of the subjects. An individual's originality is related to the amount of information he has. It is possible there may have been significant differences in intelligence between the treatment and control groups.

It can also be noted that there were more third graders in the control group than fourth graders, and there were more fourth graders than third graders in the experimental group. Torrance (1969) found steady increases in the creative abilities of subjects from first through third grades and a decline at grade four.

The control group and the experimental group were members of the same classroom. It is possible that the control group grew in creative thinking abilities due to the atmosphere in the classroom, or the approaches the teacher used in other subject areas may have affected their creative thinking skills.

No significant correlations were found between reading comprehension and flexibility, originality, and elaboration. A significant correlation was found between reading and fluency. The creative reader seems to be aware of a greater number of possibilities for understanding the author's meaning.

Implications for Classroom Practice

Although this study failed to reject the null hypothesis that there would be no significant differences between the posttest scores on the TTCT for the control group and the treatment group, a review of the literature revealed many professional studies which indicated that creative thinking skills can be taught in the classroom.

The teaching of creative thinking skills should be an ongoing process. In order to avoid the slumps which occur at various levels, particularly at grade four, creative thinking skills should be

developed at all grade levels. The creative thinking skills lessons used in this study can be developed during the language arts time in the classroom.

Students should be encouraged to apply their creative abilities to the reading process. Torrance (1970) has pointed out the relationship of fluency, flexibility, originality and elaboration to the reading process. He maintains that the creative reader, in his search for solutions, is involved in several activities: the production of a larger number of possibilities (fluency); the use of many different approaches or strategies (flexibility); the production of bold new ideas off the beaten path (originality); and the development of an idea, filling out the details, making an idea attractive or embroidering it (elaboration).

The creative reader, then, reads differently. Further research needs to be conducted to determine whether this difference in approach results in higher levels of reading comprehension. It appears that the creative reader would use his imagination to search for the author's meaning and would become more involved in the situation about which he is reading.

Implications for Further Research

This study could be replicated using only third or fourth grade students rather than a combination of both. Because it is believed that third graders are at a peak in their creative thinking development and fourth graders may be in a slump, it would probably be advisable

to separate these groups unless there is an equal number in the control and experimental groups.

This study could also be replicated using a suburban population to determine the effectiveness of these strategies in a different situation.

Subjects could be administered a measure of intelligence to ascertain any possible effects of intelligence on creative thinking abilities.

Possibly the amount of practice time needs to be lengthened in order to show more significant gains. A long range study might help to determine this.

More insight into the relationship between reading and creative thinking would be beneficial. Few studies of the transfer effect have been conducted. A study might be conducted to determine what techniques creative children use in their reading.

The effects of peer attitude could be investigated, as well as teacher attitude toward creative responses.

Summary

Although the results of this study did not show significant differences between the posttest scores of the TTCT, teachers should not be discouraged from teaching creative thinking in the classroom. There is much general research which suggests that creative thinking can be taught in the classroom. The strategies employed in this study can still be beneficial to students.

A significant correlation was found between reading comprehension and fluency. Correlations between reading comprehension and flexibility, originality and elaboration did not reach significance. The relationship between creative thinking and reading is in need of further investigation.

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APPENDIX

Lesson Plans

The lessons that follow were used with third and fourth grade students to enhance their creative thinking skills. The lessons were designed by Williams (1980). The relaxed attention warmup activities were developed by McKim (1972).

Lesson 1

To Encourage: Fluent and Original Thinking

Using Strategies: Attributes

Warmup: Stretch

1. Close your eyes and sit quietly for several minutes. Allow your attention to systematically explore the muscle sensations of your body: your face muscles, neck muscles, shoulders, and so on down. Where are you excessively tense right now?
2. Now, stand up and stretch--slowly, gracefully, and luxuriantly, like a cat. As you do, inhale deeply and feel the tension in your body.
3. With a general sigh, exhale, sit down, and relax. As you do, feel the tension letting go. Sustain this passive sensation for several minutes.

Procedure:

1. The class will discuss and list as many descriptive and unusual words as possible which best describe these situations which should be on the chalkboard:
 - a dish breaking
 - children sliding on snow
 - an airplane flying over the school
2. The class will discuss the most unusual and imaginative words after each child gives his own reasons for selecting these words.

Lesson 2

To Encourage: Flexible Thinking

Using Strategies: Attributes

Evaluation of situations

Warmup: Stretch

Procedure:

1. Students will imagine what it would be like to be preparing for a trip to the moon.
2. The teacher will ask, "How many different kinds of things can you list that you would choose to put into the pocket of your space suit if you were going to the moon?"
3. Each child will list the kinds of things he would wish to take and give a reason for taking them.

Lesson 3

To Encourage: Elaborative Thinking

Using Strategies: Attributes

Organized random search

Warmup:

1. Stretch
2. Relax Neck and Shoulders
 - a. Very slowly bend your head forward three times, backward three times, and to each side three times. Then slowly circle your head through the same movements, clockwise then reverse, three times each. Go slowly and gently.
 - b. Pull your shoulders as far forward as you can, then as far up, as far back, as far down. Repeat three times.
 - c. With the fingers of both hands, massage the nape of your neck.
 - d. Take a deep breath and, with a sigh, let go excess neck and shoulder tension . . . more . . . more . . . passively let go.

Procedure:

1. The children will pretend to be book salesmen. They will select a book and while reading it collect interesting facts about the book which they can use to sell it to another person.
2. After they finish reading the book, they will list all the things they can about the book. They will pair off in twos and try to sell their book to one another by the most convincing sales pitch they can think of.

Lesson 4

To Encourage: Original and Elaborative Thinking

Using Strategies: Creative writing skill

Visualization skill

Warmup:

1. Stretch
2. Relax Neck and Shoulders

Procedure:

1. The children will be asked to create an original map of a make-believe country and to give their country a name. They will be encouraged to make their map as unique as possible so that it can be used as a setting for an exciting make-believe story. They should include cities, lakes, rivers, and highways, plus whatever else they think will add to their imaginative interest.

Lesson 5

To Encourage: Original and Elaborative Thinking

Using Strategies: Creative writing skill

Visualization skill

Warmup: Deep Breathing

Slowly and easily take a deep breath, filling the bottom of your lungs as well as the top. As you breathe in, whisper the syllable "re." Pause for a moment, then breathe out, whispering the syllable "lax." Don't force the air in and out of your lungs: let it flow slowly and naturally; re-e-e-e (pause) la-a-a-a-ax (pause).

Procedure:

1. The children will write a story using the maps they created for Lesson 4 as the basis.

Lesson 6

To Encourage: Original Thinking

Using Strategies: Attributes

Organized Random Search

Visualization Skill

Warmup: Relax Neck and Shoulders

Procedure:

The children will be given a choice of one of the following activities:

1. Design a newspaper ad that could be used to sell a book.
2. Draw a magazine ad to illustrate the contents of the book.

Lesson 7

To Encourage: Elaborative Thinking

Using Strategies: Examples of Change

Organized Random Search

Visualization Skill

Warmup: Deep Breathing

Procedure:

"Pass Along Pictures" can be made into exciting adventure stories.

1. Each child will begin with a sheet of paper and one crayon of his or her favorite color. They will use their imaginations to draw anything they wish for one minute at which time the teacher will ring a small bell.
2. At the sound of the bell, the children will be told to pass their paper to the next child to their right. This process will be repeated six times, and the teacher will ask them to add on to the picture as many details as they like to make it exciting.
3. At the end of the sixth "pass along" each child will prepare and tell a story about the final picture.
4. After many stories have been told, each picture will be returned to its original starting position so that the children can see what has happened to their pictures.

Lesson 8

To Encourage: Flexible Thinking

Using Strategies: Attributes

Examples of Change

Evaluate Situations

Warmup: Deep Breathing

Procedure:

The following thought will be presented to the group: "Suppose all our pencils were lost today. What would we do?"

1. The children will be encouraged to take a chance and try using crayons to write with.
2. Their stories, arithmetic and other papers will be done with crayon.
3. They should find that they can change their habits and develop confidence in using a different instrument to write with by thinking through first what they are going to do since the crayon can not be erased.
4. They will make decisions as to when it is best to use a pencil and when to use crayons.

Lesson 9

To Encourage: Fluent Thinking

Using Strategies: Attributes

Organized Random Search

Creative Writing Skill

Warmup:

1. Relax neck and shoulders
2. Deep breathing

Procedure:

In this lesson the teacher will present the class with the rules of writing cinquains, a non-metrical form of poetry composed of:

1st line - one noun

2nd line - 2 adjectives describing the noun in line one

3rd line - 3 words expressing an action

4th line - 4 words expressing a feeling

5th line - one noun which is a synonym to the single noun of line one

The teacher will give the following example:

snow

glistening, white

sliding, sitting, flowing

glittering, soft, feathery, drifting

flour

The students will be instructed to write their own cinquains.

Lesson 10

To Encourage: Fluent Thinking

Using Strategies: Examples of Change

Organized Random Search

Evaluation of Situations

Warmup:

1. Relax neck and shoulders
2. Deep breathing

Procedure:

1. Children will be involved in wondering about how many words they can think of by changing the initial consonants of a given word.
2. The teacher will give an example.
3. Students will list as many words as they can from 3 words that the teacher will place on the chalkboard.

Lesson 11

To Encourage: Original Thinking

Using Strategies: Examples of Change

Creative Writing Skill

Visualization Skill

Warmup: Deep Muscle Relaxation

1. Lie down in a comfortable and quiet place.
2. Systematically (a) tense a specific muscle group (listed in step 3), (b) study the feeling of tension, and (c) relax, studying the feeling of letting go. If possible, step 3 should be read to the individual who is relaxing, the reader giving the relaxer ample time (and occasional reminders) to become aware of the feeling of tension and of letting go in each muscle group. The slash (/) signifies a pause.
3. Clench fists / Flex wrists / Hands to shoulders, flex biceps / Shrug shoulders (touch ears) / Wrinkle forehead up / Frown / Close eyes tightly / Push tongue against roof of mouth / Press lips together / Push head back / Push head forward (chin buried in chest) / Arch back / Take deep breath, hold it, exhale / Suck stomach muscles (as if someone were going to hit) / Tense buttocks / Lift legs, tensing thighs / Point toes toward face, tensing calves / Curl toes down, tensing arches / Review each activity above, letting go tension in each muscle group even more. Feel the peaceful, positive feeling that accompanies deep relaxation.

Lesson 11 (Continued)

Procedure:

1. The class will plan together an outline of the story of the "Three Bears." The outline will be written on the board.
2. Then the class will discuss how the story might be changed to make it more interesting and fun to read.
3. Each child will rewrite the story making interesting and creative changes.
4. The stories will then be read to the group.

Lesson 12

To Encourage: Elaborative Thinking

Using Strategies: Attributes

Organized Random Search

Creative Writing Skill

Warmup:

1. Relax neck and shoulders
2. Relax arms and hands
 - a. Sit or stand erect. Let your arms and hands hang loosely at your sides, like wet spaghetti.
 - b. As loosely as possible, shake your right hand. Extend your action to your forearm, then your entire arm. Let your arm rise over your head shaking the entire limb loosely and vigorously.
 - c. Stop and compare the feeling of your right arm with that of your left.
 - d. Repeat with your left arm.
3. Deep breathing
4. Devoting attention
 - a. Select an object that pleases you.
 - b. See how long you can find something new about it.
 - c. View it from many angles. Explore it with all your senses. Imagine how it is made.

Lesson 12 (Continued)

Procedure:

1. The teacher will ask these questions: "How can a sentence give us a better picture? How can a sentence paint a word picture?"
2. Then the teacher will read the sentence, "The dog sat on the porch."
3. The instructions for the exercise are to re-write this sentence by adding more information to it. For example, the teacher may suggest possible attributes be considered in describing the dog's size, color, coat, ears, tail, temperament, collar, bark. Possible attributes of porch might also be considered--color, size, material.
4. Students will write other simple sentences of their own and then expand them.

Lesson 13

To Encourage: Fluent Thinking

Using Strategies: Attributes

Evaluation of Situations

Warmup:

1. Relax neck and shoulders
2. Relax arms and hands
3. Deep breathing
4. Devoting attention

Procedure:

1. Using cardboard cutouts of letters and a mirror, the children will be involved in discovering which letters will not appear different (reversed) when reflected in a mirror.
2. Students will first make predictions, then test their predictions by holding each letter in front of a mirror.
3. They will discuss reasons why some letters appear the same and some do not.

Lesson 14

To Encourage: Flexible and Original Thinking

Using Strategies: Evaluation of Situations

Warmup:

1. Relax neck and shoulders
2. Deep breathing
3. Devoting attention

Procedure:

1. The group will be asked to name as many different kinds of signs as they can.
2. The question will then be posed, "What unusual things might happen if all the signs in the world were destroyed?"
3. Students will be asked to produce a large number of different ideas. They will speculate regarding the numerous phases of life that would be affected by the absence of directional and other kinds of signs.

Lesson 15

To Encourage: Original Thinking

Using Strategies: Creative Writing Skill

Warmup:

1. Relax neck and shoulders
2. Relax arms and hands
3. Deep breathing
4. Devoting attention

Procedure:

1. Each child will be asked to pretend he or she is a pet and to write a story about his or her life in some unusual manner.

Lesson 16

To Encourage: Elaborative Thinking

Using Strategies: Organized Random Search

Creative Writing Skill

Warmup:

1. Relax neck and shoulders
2. Relax arms and hands
3. Deep breathing
4. Devoting attention

Procedure:

1. Each student will re-read an old favorite short story.
2. They will re-write it using different kinds of descriptive words to make it as invigorating and exciting as possible.

Lesson 17

To Encourage: Flexible Thinking

Using Strategies: Creative Writing Skill

Warmup:

1. Relax neck and shoulders
2. Deep breathing
3. Devoting attention

Procedure:

1. After discussing a rainshower, the question will be asked, "How do you think you would feel about rain if you were some object like a pair of rain boots or some other thing?"
2. Each child will be asked to use his or her imagination by pretending to be something different and write about how he or she would like the rain.
3. Then the group will guess what thing each child has written about as they read their stories aloud.
4. Then each child will make a colored paper cutout of the "thing" he or she pretended to be.
5. These can later be made into a bulletin board.

Lesson 18

To Encourage: Original Thinking

Using Strategies: Organized Random Search

Creative Writing Skill

Warmup:

1. Relax neck and shoulders
2. Deep breathing
3. Devoting attention

Procedure:

1. The children will be asked to prepare an entertaining story from magazine pictures by assuming the identity or personality of something in the picture. They should make their stories as unique as possible.
2. They will read their stories to the group.

Lesson 19

To Encourage: Fluent Thinking

Using Strategies: Creative Writing Skill

Visualization Skill

Warmup:

1. Deep breathing
2. Devoting attention

Procedure:

1. Students will list all the superstitions they can think of.
2. They will discuss them in terms of how they came about.
3. Then, together, the children will develop an exciting make-believe story about one superstition.
4. Each child will have a chance to illustrate his own story in some fashion.

Lesson 20

To Encourage: Flexible Thinking

Using Strategies: Organized Random Search

Evaluate Situations

Warmup:

1. Deep breathing
2. Devoting attention

Procedure:

1. The teacher will show the class two pictures.
2. The teacher will ask the class to stretch their imaginations and wonder about as many different things as they can that might have happened just before these pictures were taken and to write about their ideas.
3. Many different ideas and possibilities should be offered.

Lesson 21

To Encourage: Elaborative Thinking

Using Strategies: Visualization Skill

Warmup:

1. Deep breathing

Procedure:

1. The children in the group will be given 8 1/2" x 11" white sheets of paper.
2. They will be asked to use their imaginations to fold it so that 12 squares would result.
3. Next they will be asked to write a very complete and accurate description about any wild animal they can visualize.
4. The children will read their descriptions to the group.
5. The listeners will be asked to use their imaginations and draw the animals on each square of the paper. They will be told to draw accurately only those physical characteristics mentioned by the reader.
6. After the squares have been filled, class members will attempt to name the animals.

Lesson 22

To Encourage: Fluent Thinking

Using Strategies: Creative Writing Skill

Warmup:

1. Deep breathing
2. Devoting attention

Procedure:

1. Children will have a choice of writing about one of the following questions:
 - a. When do ghosts have the most fun?
 - b. How many kinds of explosions are caused by people?
 - c. If you were an elephant what would "big" mean to you?
 - d. Think of all the things that are stored in . . . cans, bottles, tubes, boxes, etc. . . . and in what else?

Lesson 23

To Encourage: Flexible Thinking

Using Strategies: Visualization Skill

Warmup:

1. Deep breathing
2. Devoting attention

Procedure:

1. The teacher will ask the class to think of as many different words as they can that express one kind of feeling. As an example, the feeling of happiness can be discussed. The words "happy means" will be placed on the board. The group will brainstorm all of the different words they can think of that might be used to mean happy.
2. Then eight different kinds of emotional feelings will be selected and each will be used to brainstorm a long list of synonyms.
3. These will then be illustrated and each child will draw a picture of his own feelings about each list of words using his imagination as to how such feelings might be visualized.