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Incidental Learning from Visual Displays among Fourth Grade Students

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INCIDENTAL LEARNING FROM VISUAL DISPLAYS AMONG
FOURTH GRADE STUDENTS

THESIS

Submitted to the Graduate Committee of the Department of

Education and Human Development

State University of New York

College at Brockport

in Partial Fulfillment of the

Requirements for the Degree of

Master of Science in Education

by

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ABSTRACT

The purpose of this study was to find out whether fourth grade students can recall information from untaught visual displays. One hundred and forty three students in six different classrooms were given a pretest on the names of the three branches of government and the main task of each. The three week treatment was comprised of a poster with pictures and print displayed prominently on the walls. At the end of the treatment, the pretest was readministered as a posttest. A t test indicated that the students exhibited a significant growth in the amount of information they know. They recalled information that they had been exposed to only in an incidental manner.

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CHAPTER I

Statement of the Problem

Overview

Are teachers able to cover an ever-growing mandated state curriculum in a typical six-hour school day? This is the question that seems to be on every elementary educator's mind. In many instances, material is simply not taught because of a lack of time. However, this may be remedied simply by providing visual displays in a classroom. Considering the value of incidental learning, Stampe (1993) stated that the unhurried, flexible, self-directed nature of informal learning situations was congruent to a rich education.

It is known that children are naturally inquisitive. Therefore, educators may capitalize on this by providing valuable visual aids that will gain students' attention thereby enhancing the opportunity for learning to occur. There are numerous reasons as to why visuals are so important to learning. Visual communication is fundamental to humans in both an evolutionary and developmental sense. Evidence grows pertaining to the fact that humans communicated with gestures of objects and body developing verbal language. In fact, eighty percent of all information comes to us visually (Debes & Williams, 1974). The fact that learning from pictures can take

place without any formal training is an indicator of the tremendous potential that it has to limit cultural difference in all aspects of learning (Hurt, 1989).

Purpose

The purpose of this research project was to determine if fourth grade students can recall information from untaught visual displays.

Question to be Answered

Was there a statistically significant difference between the mean pretest scores and the mean posttest scores on identical tests of student learning?

Need for the Study

In education, the amount of curriculum that is required to be taught increases every year. However, the amount of time that a student is actually in school does not increase. Therefore, teachers must devise ways to ensure the learning of all required material in the most effective manner.

If students were able to internalize information that was posted on the walls of classrooms without the teachers having to actually “teach” it, then a great deal of knowledge could be instilled

by using this method. The task of teaching could be simplified, and more time could be spent on the actual analysis of the presented material.

Previous research seems to have only touched on the questions of students' independent learning from visual information.

Definition of Terms

Visual Stimuli - Anything that is present in the school setting from which the observer may discern something. Photographs, maps, signs, charts, lists, diagrams and illustrations are just a few examples.

Incidental learning - Learning which happens in the course of teaching something else, or simply by chance.

Summary

This research study's focus was on students' incidental learning from visual stimuli in the classroom. Valuable time and effort could be saved if students learned material that was simply posted. What is the extent of the visual information that students recall? This study's purpose is to answer if and how much students mastered.

CHAPTER II

Review of the Literature

Overview

Incidental learning starts from the time a child is born. Dr. Benjamin Spock (1997) said that incidental learning occurs through the lives of children, but is most profound in their younger years. Therefore, children entering school are already familiar with this valuable learning tool. Incidental learning is also a valuable component in the area of language acquisition in younger children (Elley, 1997).

Incidental learning is also a valuable mechanism in non-traditional classrooms. Espiritu (1987) states that this type of learning has been the most prevalent method of teaching cognitive concepts in elementary physical education. Visual stimulation offers an alternative for elementary physical educators with limited time. It also helps generate student interest and enhance motivation to participate in personal fitness pursuits (McCallister & Meyers, 1994).

Based on their review of the research in their area, Debes and Williams(1974) state that perhaps thirty percent of all children can learn more efficiently visually than verbally. Therefore, effective

use of visuals in our education system can only serve to further enhance a student's education development.

Properly planned bulletin boards or displays can be educational. Abstract concepts can be visualized and the general learning environment can become much more exciting (Randall & Haines, 1961). Learning can be enhanced through the use of bulletin boards. Mugge (1970) agrees that learning is enhanced through discovery, involvement, and participation. A well thought out bulletin board can offer the opportunities to learn by: observing, critical and creative thinking, following direction, and problem solving. In short, a well-designed bulletin board involves the reader.

Visual imagery plays an increasing dominant role in the acquisition of knowledge. Based on the review of research, Goldstone (1989) concludes that the majority of a child's time is spent interpreting the visual images of illustrations, advertisements, and television (Goldstone, 1989). In a similar study which examined at the effects of animated graphic presentations concerning Newton's laws of motion, seventy fourth-graders displayed an obvious pattern of incidental learning (Reiber, 1991). In addition, the motivation to inquire into the subject matter at a greater depth was enlightening.

A study which involved third graders and the recall of pictures was completed by Ghatala and Levin (1981). Their findings indicated that incidental memory for pictures was increased when an orienting task that emphasized the organization of the picture was used. It was found that three types of features are most likely encoded for pictures (visual, phonemic and meaning). Imagery was also found to have a positive effect on incidental learning material in the classroom in a study conducted by Goldberg (1974).

In a different study which involved pictures as stimuli, a group of children ages three to five were tested regarding incidental recall of oral words and oral words with pictures presented. It was discovered that the recall of the words that were presented with the pictures were higher than the words that were presented only orally (Kau & Winer, 1987). Furthermore, in a similar study, it was found that a group of first and fourth grade children who received information in both visual and verbal forms scored higher on immediate and long term retention than a group who received the same information in just one form (Vasu & Hoewe, 1989). One such study that focused on Indian and Inuit children concluded that Native children learn best from visual stimulation (Kaulback, 1984).

Visual displays enhance the educational experience for a wide range of learners. In a study conducted by Fox and Rotatori (1979) it was found that one hundred and twelve children with mental retardation learned material incidentally from bulletin boards. In addition, a similar study conducted by Elson (1995) focused on an intervention program involving visual stimulation on seven elementary students who were classified as having severe/profound mental retardation and multiple disabilities. After pretesting students' initial functioning, daily performance on the activities was documented, and a posttest assessing physical performance of the intervention activities was administered. Results indicated that the subjects increased their auditory and visual skills in most targeted areas. In another study, a group of educable mentally retarded 13 to 15 year olds and matched mental-age comparison subjects participated in a imagery-based, associative learning pictorial elaboration task, followed by a delayed test of incidental learning. Both groups were able to generate original elaborations, although fluency and incidental learning scores of non-EMR subjects were higher (Greenson & Vane, 1986). In fact, one such strategy which is presented as a way to help ADHD students succeed is the use of visuals to aid in incidental learning (Clawson, 1992). Results of yet another study illustrate that instructions to use imagery facilitate the intentional and the incidental learning of

both normal and educable retarded children (Yarmery & Bowen, 1972). Furthermore, teachers can maximize instructional time for mainstreamed learning disabled students by simply displaying visual materials (School & Cooper, 1983).

Based on past research however, not all findings regarding visual displays are positive. Creekmore (1987) concluded that the classroom environment has far too many distracters, which do not facilitate learning. Too many visual displays actually distract from teaching. He suggests setting aside one wall in the classroom to post materials that have previously been taught. He calls this the "maintenance wall." Another wall (which he refers to as the "dynamic" wall) should house seasonal displays, and thus be constantly changing. He states that a busy, over-stimulating room increased off-task behavior and detracts from a successful learning environment.

There is one type of child that does not function well with too many visuals in the classroom. Students with high functioning autism need to avoid over stimulation in order to perform to their capability level (Reed, 1996).

In a similar study, a group of migrant children in the Connecticut School program were placed in a program, which emphasized visual stimulation for the purpose of incidental learning. The research showed that basic skills in the students

improved very little. However, the children's attitudes about going to school were positively changed (McGowen, 1969).

“Sensory overload” is a condition that may affect many students. Before any real teaching can take place, teachers must combat “visual fatigue” in our visually overloaded society (Bercsi, 1987).

Summary

There is research that indicates that visual aids in classrooms can aid in the process of learning. In many cases, incidental learning does occur through the use of untaught visuals. Based on this review of the research, teachers should consider designing and using visual aids in the classroom in order to take advantage of this valuable teaching tool.

CHAPTER III

Design of the Study

Introduction

The purpose of this research project was to determine if fourth grade students can recall information from untaught visual displays.

Research Question

Is there a statistically significant difference between the mean pretest scores and the mean posttest scores on identical tests of recall from untaught visual displays?

Methodology

Subjects:

The subjects for this study were 129 fourth grade students from six classrooms in a suburban upstate New York school district. Students who missed either the pretest or the posttest were eliminated, as was any child who missed more than a week of school during the treatment.

Materials:

The materials included one poster, which measured two feet by three feet. The poster outlined the three branches of government and the major task of each. The poster was comprised of print, as

well as illustrations. The letters were approximately two inches tall and printed in black ink. The topic was purposely chosen due to the fact that it is covered in the fifth grade Social Studies curriculum, and therefore most students would not have been taught this.

Instruments:

The test was the same in both pretest and posttest form. It asked students to write the three branches of government and the main task of each.

Procedure:

For the pretest, each student was asked to list the three branches of government and their respective main tasks. They were told that a grade would not be given for this particular assignment and this it was just an information gathering tool for the teacher. The pretest will not be reviewed.

After waiting approximately two weeks (to allow recollection of material to fade) the poster was displayed in each classroom. A prominent location was chosen, in order for all students to have a clear view of the visual display.

The information on the poster was not taught. When the teacher was questioned by a student as to why the poster was displayed, the instructor simply replied that it was just something different to display on the bulletin board.

The poster was displayed for three weeks and taken down. After a time period of two weeks, the posttest was administered, which was identical in nature to the posttest.

Analysis

The pretest and posttest scores of the students were evaluated for significant variation using a correlated t test.

CHAPTER IV

Statistical Analysis

Purpose

The purpose of this research project was to determine if fourth grade students can recall information from untaught visual displays.

Null Hypothesis

There is no statistically significant difference between the mean pretest scores and the mean posttest scores on identical tests of recall from untaught visual displays.

Analysis of Data

The GB-STAT statistical software program was utilized in this statistical analysis.

On the pretest, students correctly answered from zero to four questions of the possible six. On the posttest, students correctly answered from zero to six questions.

The median on the pretest was 0, while on the posttest the median was 1. The mean score on the pretest was .605. On the posttest, the mean increased to 1.57. The standard deviation on the pretest was 1.06, and on the posttest it was 1.63.

Table 1 presents the results of the t -test analysis of the pretest and posttest scores.

Table 1

t -Test Analysis of Pretest and Posttest Scores of Information Recall

Test	Mean	SD	Calculated t
Pretest	.605	1.06	
Posttest	1.57	1.63	7.37

Critical t at .05 level = 1.96

The paired t test required a critical t value of 1.96 at the .05 level of significance. The calculated t value from the samples was 7.37.

The paired t test indicates that there was a statistically significant difference between the pretest and the posttest scores of the students. The statistical analysis suggests that the students did recall the untaught information that was visually exposed to them by the teacher.

CHAPTER V

Conclusions and Implications

Purpose

The purpose of this research project was to determine if fourth grade students can recall information from untaught visual displays.

Conclusions

This study of 129 fourth grade students in six classrooms showed that students did recall information from untaught visual displays. A statistically significant difference between pretest and posttest scores indicates that incidental learning did occur from untaught visual displays in the classroom.

The results of the research were not surprising. As a visual learner, it is easy to appreciate the effectiveness of visual displays. Moreover, Dr. Benjamin Spock states that children who are just entering school are already familiar with this learning tool (1997). It just seems natural to continue to take advantage of this type of learning once they commence their educational career.

Visual displays can prove to be advantageous in a classroom filled with students who master information in many different ways. Being aware of multiple intelligence among children is the wave of

the future. Teachers who are dealing with blended and integrated classes must try and find a way to reach all students. Visual displays may be one means in which they accomplish this. Elson's research in 1995 dealt with this issue and his findings indicated that children with severe mental retardation and multiple disabilities increased their auditory and visual skills due to visual stimulation.

It is not unexpected that a visually stimulating classroom environment improves a child's attitude towards learning. School becomes an exciting place to return to. McGowen's research (1969) verifies this.

In our ever-changing society which seems to rely more and more on visual stimulation in all aspects of life, it makes sense to extend this idea to the classroom. Based on Debe's and William's research in 1974, thirty percent of children learn more effectively visually than verbally. Actually, the results of this research seem quite conservative.

Classroom Implications

This research study indicates that visuals in the classroom should be utilized in order to enhance a child's learning experience. A student's visual environment should consist of a variety of information that needs to be memorized. This information should

be prominently displayed in order to capitalize on this valuable learning tool.

Visual information to be displayed can include items that the instructor has too little time and/or desire to teach. Students can recall a portion of the displayed information regardless of whether it is taught or not.

A variety of information could be presented via classroom visuals. In the lower grades a large poster displaying community helpers and their roles may be appropriate, as would a large map of the local community which highlighted important buildings in the community. Tasks which involve multi-level instructions would be better taught by displaying visual enhancements. Rules, maps, definitions, and any other material that requires memorization would be more easily comprehended if it were prominently displayed in the everyday classroom environment.

This particular study proved that a significant amount of information can be learned from untaught visual displays. However, it must be pointed out that there were very few students who displayed a mastery of the material displayed. A teacher's direct involvement may be required in order to reach the desired goal of mastery of the information. It is clear to this researcher that visuals should be used as often as possible.

Research Implications

In future research, there are many areas that could be investigated in regards to this topic. The utilization of different types of visuals used at different grade levels could be studied. Print size, amount of print and color of print could be tested and researched.

Gender recall of incidentally learned material could be researched. This would indicate whether boys or girls have a greater recall of untaught visual information.

Long term recall of incidentally learned information was not a focus of this research. This could be an area in which future researchers may be interested.

Students' anxiety level may be an important component for future researchers to look at. The students may have performed better on the posttest if they knew at the beginning of the study that they would be taking a posttest. In this research the children were not made aware of a posttest because of the need to test incidental learning.

A further investigation into the recall of information that is both taught and visually displayed could be conducted. This tends to be the case in most classrooms. Visuals are used to reinforce material that has previously been taught.

Researchers may choose to investigate these questions, as well as others, in future studies.

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