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A Study of the Benefits that Audio-Visuals Have on High School Crafts Classes

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A STUDY OF THE BENEFITS THAT AUDIO-VISUALS HAVE ON HIGH SCHOOL CRAFTS CLASSES

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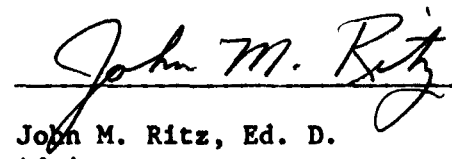

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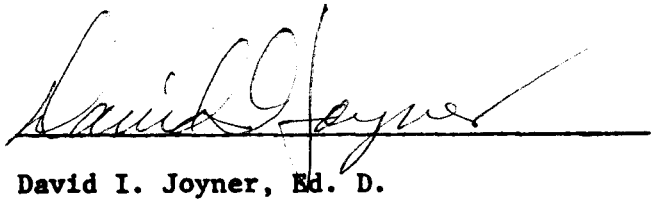

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CHAPTER I

INTRODUCTION

In the society of today, much negative feeling has come through the over indulgence in the visual media of television and movies. This feeling is often times transferred into the classroom. However, many people outside the educational field look at audio-visuals from a standpoint of entertainment rather than of their educational benefit. The classroom can become the ideal site for audio-visuals to be used to their fullest. Teachers of all subjects, especially Industrial Arts, can improve their teaching through the use of audio-visuals. The area of pottery making, where vessels are made on a potters wheel, is particularly adapt in using audio-visuals. The question of the benefits the student gains through learning by means of visual aids has been dealt with in this paper.

STATEMENT OF THE PROBLEM

The problem of this study was to ascertain the benefit that a slide-tape series had on wheel throwing in an Industrial Crafts class. The benefit of using visuals in wheel throwing and other related areas will be determined through the data provided in this study. The subsequent sections will discuss this basic research goal.

HYPOTHESES

The fundamental hypotheses of this study was:

Students who learn by the audio-visual technique will have a higher test score on "Throwing on the Wheel" than those students who learn by way of lecture/demonstration.

The benefits that come from the use of audio-visual equipment compared to the total outlay of money spent is a serious question that an educational system must answer (Main, 1977, pg. 167). The researcher feels an appraisal of the benefits of audio-visuals should be given. Background and significance of audio-visuals will follow in the next section.

BACKGROUND AND SIGNIFICANCE OF THE STUDY

Modern educators must exhaust all means to find the best possible method of teaching today's youth. The significance of this section is to help understand the best media programs.

Education discovered the child around the 1880's. Up to that time, the child was thought to be a miniature adult (Carlisle, 1976, pg. 149). Then and until today, lecture has been the major channel between the teacher and student. Today we are surrounded by visual stimuli of many kinds through advertising and the mass media. These kinds of visuals are everyday occurrences to everyone.

In a survey taken throughout the United States, visual-aids enthusiasts found the following information to be true:

We Learn:

1 % through taste

1.5 % through touch

3.5 % through smell

11 % through hearing

83 % through sight (Eble, 1976, pg. 83)

Through the survey it can be noted how education can benefit from the usage of visuals. It is the obvious avenue to take when looking for the best method to learn. Businessmen had used video tapes for teaching and demonstrations for many years with great success. It not only increases the constant for everyone learning the same information, but makes review and changing of formats easier.

Any method that works as a teaching tool should be facilitated to aid learning. Educators have long strived to find the best way for students to respond and receive feedback. This study is to prove how the use of visual aids improves learning.

Many sources can be found to provide good inexpensive visual aids. Government agencies, school systems, private industries and individual educators are just a few of these many sources.

Creating an audio-visual lesson or concept can be a learning experience in itself for the student. He will not only learn the information that will be taught through the instructional process, but gain insight through the actual involvement of "visuals" construction.

LIMITATIONS

If the student is not present during a visual or a lecture/demonstration, he will miss the total concept. This, in turn, will effect the findings and conclusions. Accurate attendance procedures will take place during both presentations and testing. All classes will take place in the morning to make certain fresh minds will be had by all involved. The two factors which cannot be foreseen are the classroom personality and the effort the students put forth. These both are not possible to measure.

PROCEDURES

The Industrial Crafts II program at Kempsville High School in Virginia Beach, was the site of the study. Four morning classes, of approximately 68 students, made up the test groups. These senior high students were taking this elective subject in the fall of 1979. For the most part, the students had little or no knowledge of the subject before entering the class.

The test groups were all morning classes to ensure fair and equal measuring of knowledge learned. The first and third classes were taught the steps involved in throwing on the potters wheel by means of lecture/demonstration. The second and fourth classes were taught the steps involved in throwing on the potters wheel by means of audio-visual, in this case, slide-tape presentation. Both classes were given the same test to survey their newly attained sophistication. Test scores were tabulated and tables constructed to measure the students knowledge.

DEFINITION OF TERMS

audio-visuals -- an instructional media that involves both sight and hearing

slide-tape -- a media using both sight and sound to convey a particular concept of instruction. These can be bought or made by the educator.

potters wheel -- a machine used to create handmade earthen vessels from various types of clay

visuals -- involving only the sense of sight as a teaching method

lecture/demonstration -- a teaching method which is first verbal in its instruction and then followed by an example of the concept or idea to be presented to the group or class.

instructional media -- a method used to inform or teach a subject or idea

vessels -- a container used for holding; made of clay

clay -- a soft pliable material which can be molded when wet and becomes hard and servicable when fired in heat

SUMMARY OF CHAPTER I

Throughout Chapter One, the value of audio-visuals, as an educational tool, has been discussed. The adaptation of visuals as an educational benefit have long been argued. This concept will be proven by means of the data gathered by this paper.

All other chapters will deal with the children being tested and measure how effective audio-visuals teach those students.

CHAPTER II

REVIEW OF LITERATURE

The speed of technological change strains the capacity of our educational systems to meet demands for new skills and abilities. In response to these demands, a flood of instructional materials is being produced and used by school systems, colleges, military institutions, and by commerical organizations. Many of these educational materials include audio tapes and/or pictorial presentations (Main, 1977, pg. 167). The literature reviewed dealt mainly with the use of audio-visual materials in education today and demonstrates the advantages of visuals in learning.

MEDIA USE IN EDUCATION

In the classroom, the traditional chalkboard has been supplemented by the slide projector, overhead projector and other visual medias (Maddox, 1977, pg. 602). Studies indicate that audio and/or pictorial presentations may increase learning by creating interest sufficient to motivate the student to study (Main, 1977, pg. 176). The motivation factor is ever more becoming a consideration of educators today.

A group of minority students received attention both in a classroom setting and through a series developed for educational television. The Multi-Cultural Project in the East Chicago City School District was intended to improve attitudes among racial and ethnic groups. Videotape and closed-circuit television brought the project into the lives

of the group. The "Infinity Factory", as it was called, was aimed primarily at black and Hispanic children. This television series was developed to help children ages 8 through 11 understand the everyday usefulness of some basic mathematics skills. The study had surveyed communities that had various amounts of exposure to television. The results indicated that visual media, especially television, is a major change agent in patterns of daily life (Educational Resources Information Center, 1977, pg. 211). Through this, it can be seen how the use of visuals, on all levels of learning can be enhanced and improved.

The finding that the addition of pictorial presentations improves the effectiveness of verbal instruction has been well documented. The addition of pictures aided story comprehension by fourth grade readers reported Peek (1974). Rasco, Tennyson, and Boutwell (1975) found that high school students had increased comprehension of mathematical concepts when pictorials were added to the lesson. Dwyer discovered that by adding pictures, the effectiveness of physiology instruction was improved, whether this was presented to high school students (1967) in texts or to college students in lectures (1968). The addition of pictorial presentations improved the effectiveness of an Air Force text on fire fighting, reports Sellman (1972) (Main, 1977, pg. 168). The findings of Nelson (1954) in art, Newhall (1959) in missle electronics, and Brydon (1971) in blueprint reading are all in agreement that learning of subject matter material was effectively increased by using visuals (Trohanis, 1975, pg. 403).

In a project sponsored by the National Institute of Education, a course in diagnostic and prescriptive reading instruction was presented by satellite to a group of educators. They observed cognitive, affective,

and classroom practice changes. The participants were kindergarten through third grade teachers in the Appalachian region. They demonstrated gains in performance on course objectives and a positive change in their attitudes toward concepts and principles presented in the course (Mayhew, 1976, pg. 349). Age therefore makes no difference as to the benefits of visuals as a benefit to faster and more long lasting learning.

With visuals so much a part of everyone's life, especially young people, the concept of using this media for educational purposes is never ending and should be used in all areas to entice learning. With modern up-to-date techniques, visuals enhance and contribute invaluably to learning experiences. Young people are consistently surrounded with the use of visuals, from television to the movies of the day, in their everyday life. This media often times used for entertainment, can and should be used for learning and educating.

EFFECTS OF VISUAL MEDIA

No one can seriously question the value of visual media. Words are poor substitutes for maps, diagrams, tables, and especially audio-visual media. While common objects, quantities, colors, and sizes can be readily described through speech, some things like shape, position, or spatial cannot (Maddox, 1977, pg. 601).

Sammuels (1970) reviewed studies concerning the effect that pictures have on learning and how they influence attitudes. These findings were supported later by Samuels, Biesbrock, and Terry (1974) showing that children much preferred stories with illustrations (Jahoda, 1976, pg. 296.

Along the same lines Magne and Parknas (1962) found a general superiority of pictorial over verbal learning. This study was done world-wide and was generally concluded that pictorial presentations were superior in all countries (Jahoda, 1976, pg. 306). "Given appropriate conditions, pictures enhance learning in all cultures. They do this either by directly aiding the acquisition of information, or by indirect facilitation of the learning process"(Jahoda, 1976, pg. 314).

Highet speaks of the natural pleasure of learning that becomes difficult only when made compulsory (Eble, 1976, pg. 196). By using a common media such as visuals, the learning becomes more of an enjoyment instead of a chore.

There are several theories as to the ease of learning by pictures and visual expressions. Some theorists have studied the possibility that pictures are memorable simply because they are less frequently encountered than words (Fleming, 1977, pg. 47). Another theory is that mental imagery facilitates learning because it involves the more fundamental feature of organization. Generally, organized presentations are easier to learn than unorganized or randomly ordered presentations, and thus interactive mental imagery (organized) would be expected to be better remembered than unorganized imagery (Fleming, 1977, pg. 48).

When only verbal instruction is being used for a lesson, only one sense is being used. By combining visuals with the verbal instruction you not only have both senses, but you have another mode of presentation. The visuals can draw attention to particular points of information, or they may emphasize functional or structural relationships that can often times become buried in the verbal content. In short, pictures have the ability to change the character of the information being presented (Main, 1977, pg. 168).

Audio supplements will have the same effect as the addition of visuals. In a study by Sellman, the effectiveness of a visual presentation was further enhanced and greater learning took place with the addition of audio. The audio can be used in such a way as to emphasize the importance of visuals (Main, 1977, pg. 168).

SUMMARY OF CHAPTER II

When visuals are compared to words as stimuli in experimental learning tasks, significant differences are usually found. Visuals result in a better performance in the recognition of memory tasks. (Snodgress, Volvovitz and Walfish, 1972, Standing, 1973) and as stimulus items in paired associate learning tasks. (Kopstein & Roshall, 1954; Jenkins, 1968) (Levie, 1975, pg. 81).

The learning environment can benefit greatly from the use of visuals not only by learning quicker and easier, but by motivating the students at a more enjoyable level in education.

Chapter III will deal with the methods and procedures used during this study.

CHAPTER III

METHODS AND PROCEDURES

In this experimental study, the researcher, through tests and evaluations, will determine what teaching method facilitates learning to a high degree, either lecture/demonstration or audio-visual. The methods and procedures of testing will be discussed in this chapter.

POPULATION

The students enrolled in Industrial Crafts II, at Kempsville High School during the fall of 1979, made up the subjects for the researcher's study on the value of audio-visuals. A total of 68 students were enrolled in the testing. The control group of two classes were being taught by the lecture/demonstration method, and the experimental group of two classes were taught by an audio-visual slide presentation made by the researcher.

The two groups came from the researcher's morning classes. The control groups were divided among the first and third bells; whereas the experimental group came from the second and fourth bells. Having both classes spaced throughout the morning hour invalidated any effect the time of day might have had on the results. Including working time, the study took place in a four day time span. Completing the instruction took two days. One day was used for review, and the fourth day was used to test the two groups, both of which used the same test.

During the study, all routine time schedules were adhered to. No variation took place involving school or teaching methods except for

the experimental group. The students were led to believe the four experimental days were typical days in an Industrial Arts classroom.

TEACHING PROCEDURE

To ensure unbiased testing and results, all routine times and schedules were adhered to for teaching a typical unit. The Industrial Crafts classes last for 55 minutes, with the first 25 minutes being used for instruction of the potters wheel.

During the instruction, both groups received the same information. The teacher made use of only the potters wheel and the chalkboard with the control group. The use of a teacher made slide tape series and visual posters were used by the experimental group.

TESTING PROCEDURES

On the fourth day of this experiment, a test was given to each student in both groups. This test was a typical end-of-unit measure of knowledge. All students, regardless of which group they were in, filled out classroom information in regard to bell and date. The control and experimental groups had a different code color on the top of their respective tests to facilitate which method they learned from. The students were unaware of any variation in colors.

Each test was made up of two types of questions, multiple choice and true and false. A general understanding of the potters wheel was needed to answer the questions. A sample of the test is found in Appendix A.

COLLECTION AND ANALYSIS OF DATA

The researcher reviewed and scored each test. Significance of difference testing was calculated. Fisher's "t" technique for independent sampling was used to test the significance of difference between the means obtained for the two test groups. The test scores were assumed to be normally distributed for the population for using the "t" test. The following formula was used in these calculations:

$$t = \frac{M_1 - M_2}{\sqrt{\left(\frac{\sum d_1^2 + \sum d_2^2}{N_1 + N_2}\right)\left(\frac{N_1 + N_2}{N_1 N_2}\right)}}$$

SUMMARY OF CHAPTER III

The question was, are the operations involved in wheel throwing learned more effectively. Tests were run to measure the results. Two groups were used for the testing, one experimental group and one control group. A routine schedule was kept to facilitate normalcy. The findings will be discussed in the next chapter.

CHAPTER IV

FINDINGS OF THE STUDY

Does a slide-tape series result in a better understanding of the operations involved in wheel throwing was the question to be answered during this study. The method of instruction would vary between the two test groups.

One group of students learned by the lecture/demonstration method while the other learned by means of visual aids. Each group was made up of two classes of high school students. Both groups were administered a test of 15 questions. These questions dealt with the operations involved in wheel throwing before satisfactory work could begin.

A review of the operations involved in wheel throwing were given to the classes prior to taking the test. The researcher gave the students a chance to ask questions and clear up any misconceptions they might have before the test began. The papers were passed out and the students were instructed to put forth a conscientious effort. The test lasted for approximately 15 minutes.

After testing was completed, the papers were collected and corrected by the researcher. The results were used to test the hypotheses.

Students who learn by the audio-visual technique will have a higher test score on "Throwing on the Wheel" than those students who learn by way of lecture/demonstration.

The following tables explain the information and data gained from the tests. Improved instruction by the use of audio-visual aids is

shown by the number of students who scored higher on the test noted in Table I. The frequency of scores received by both groups are shown in Table II. Grouped frequency distribution of both test groups is shown in the histogram explained in Table III. Table IV shows the two means of both groups. A significant difference between the two sample means are noted in the "t" scores shown in Table V.

SUMMARY OF CHAPTER IV

This study took place to find out if a higher quality of learning took place when audio-visuals were used as a teaching tool. The classes were learning to throw on the potter's wheel. Two groups of students made up the test groups; one group taught by lecture/demonstration and the other by the use of audio-visuals.

TABLE I

The Total Number of Questions Missed by Both Groups

Method	Wrong Answers	Total
Lecture/ Demonstration	-0	6
	-1	10
	-2	7
	-3	4
	-4	6
	-5	2
	-6	0
	-7	1
Total Tested		36
Audio-Visuals	-0	11
	-1	10
	-2	6
	-3	2
	-4	1
	-5	2
Total Tested		32

It can be discerned from the above table that the classes that were instructed by the lecture/demonstration method had a greater number wrong. It can also be noted that students instructed by the audio-visual method had fewer mistakes and higher scores accordingly.

TABLE II

Test Scores For Control Group of High School Students Instructed by the Lecture/Demonstration Method for "Throwing on the Potter's Wheel"

percent score (x)	frequency (f)
100	6
92	10
84	7
76	4
68	6
60	2
52	0
44	1

Test Scores for Experimental Group of High School Students Instructed by Audio-Visual Method for "Throwing on the Potter's Wheel"

percent score (x)	frequency (f)
100	11
92	10
84	6
76	2
68	1
60	2

TABLE III

HISTOGRAM FOR A FREQUENCY DISTRIBUTION (Grouped)

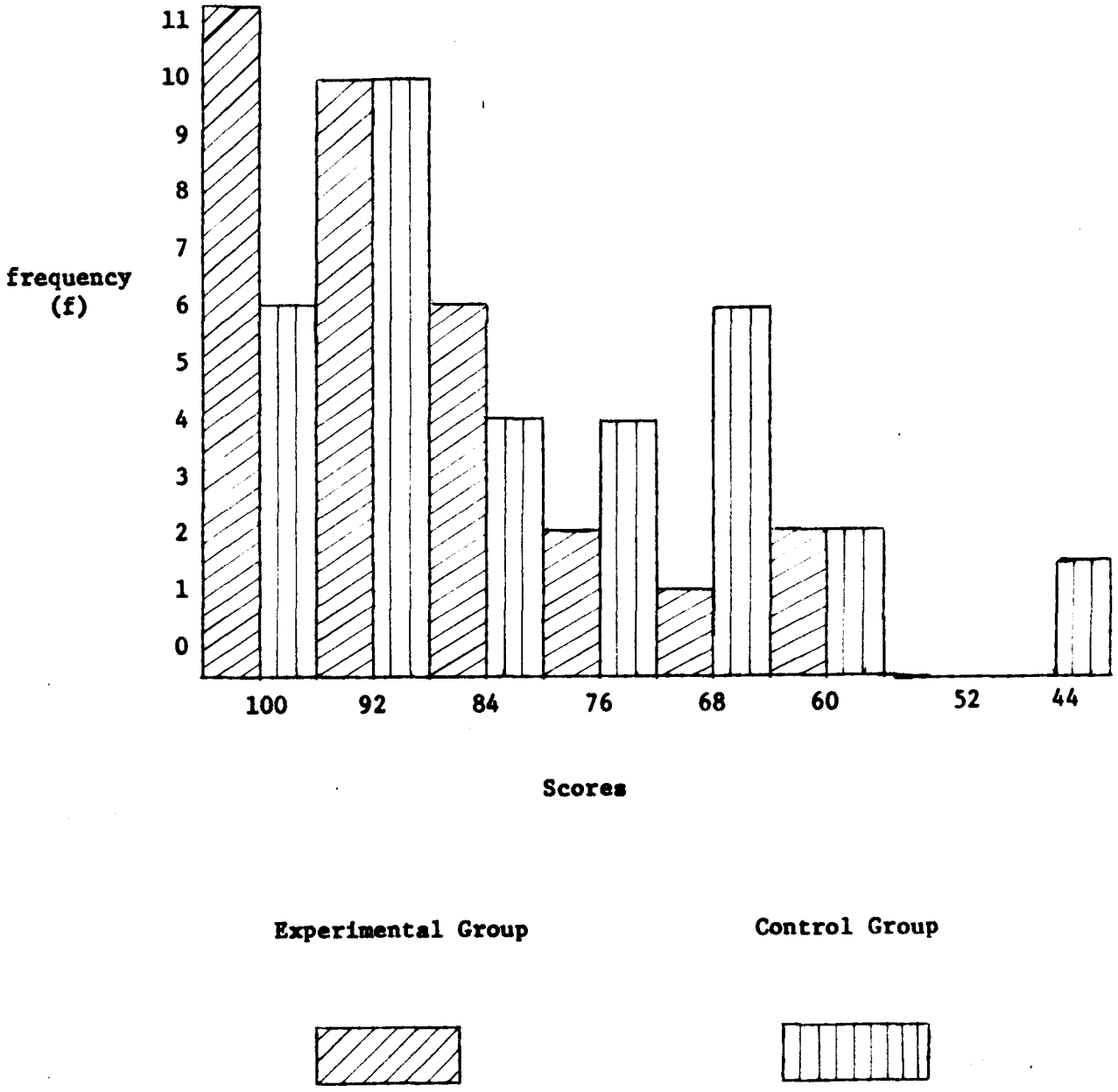

TABLE IV

MEASURE OF CENTRAL TENDENCY

(Mean)

The mean score of the experimental group (audio-visual method)

89.5%

The mean score of the control group (lecture/demonstration method)

82.9%

The above mean scores demonstrate that overall, scores are higher when the classes are instructed with audio-visuals than when the class is instructed with the lecture/demonstration method.

TABLE V

Fisher's "t" technique was computed and showed a significant difference between the experimental and control groups.

	Control Group (Set 1)	Experimental Group (Set 2)
N =	36.	32
Mean	82.9	89.5
d^2	6675.56	4024
	t = 2.12	

The "t" ratio of 2.12 exceeds 1.96, so we can assume the difference between the means are significant at the .05 level of significance. Therefore, the hypotheses is accepted.

Research in Education, Turney and Robb, The Dryden Press, 1971.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

This study showed the value of audio-visuals as an educational tool. It pointed out how learning is enhanced and better performance results from using visuals. Two groups were used for the testing. The experimental group was taught with the audio-visual method and the control group with the lecture/demonstration method. Testing demonstrated that a higher quality of learning took place through the use of audio-visual instruction.

CONCLUSIONS

This study shows that when visual aids are used, improved learning takes place. The "t" test demonstrates how instruction does indeed benefit when visual aids are used (Table V). The use of the visual aids cannot only improve instruction, but make learning more pleasant for the student. Individualized instruction can be optimized for every students speed of learning. Make-up work and review will no longer take valuable time away from teaching. All students will see and hear the same instruction when audio-visual aids are used in the classroom. Lectures and demonstrations can now be used to a minimum, allowing for individual instruction to help the students who might need extra help.

It was observed by the researcher that the experimental group was more eager to begin working, and in turn, did a better job after being

instructed by means of audio-visuals. Their understanding and assurance were noted in the quality of the work they produced. The slide-tape series was well accepted by the students and did in fact hold their attention better than a lecture/demonstration.

This study confirms that a higher degree of learning took place through the use of audio-visual instruction. This can be clearly seen by the mean scores of each group with the experimental group having a mean of 89.5 and the control group scoring lower with a mean of 82.9. It was determined that the "t" ratio of 2.12 exceeds 1.96, so we can assume the difference between the means are significant at the .05 level of significance.

RECOMMENDATIONS

The researcher proposes the following recommendations based on the information observed through this study:

1. The study should be repeated with other age students to demonstrate the potential that audio-visuals have on all ages.
2. A method should be devised to determine an IQ comparison between the two groups and it's effects on the testing.
3. This study should be extended to other competencies involving machines and tools to see if the learning increases.
4. Because of the various types of audio-visual equipment, there needs to be an evaluation of their effectiveness.
5. The study reinforces the need to integrate audio-visuals into all areas of education.

APPENDICES

APPENDIX A

NAME _____

BELL _____

DATE _____

"THROWING ON THE POTTER'S WHEEL"

A. Directions: Read each question and select the answer that best completes each statement. Circle your response.

1. What are the hand positions when centering the clay on the potter's wheel?

   a. 3 and 9 o'clock
   b. 2 and 7 o'clock
   c. 4 and 10 o'clock
   d. 12 and 6 o'clock

2. The main steps used for wedging the clay are

   a. cone
   b. tabs
   c. cylinders
   d. all the above

3. What positions should your hands be in when shaping the clay after opening the hole?

   a. 3 o'clock
   b. 6 o'clock
   c. 9 o'clock
   d. 12 o'clock

4. The foot statement is used to determine the

   a. size of the opening
   b. outside diameter of the vessel
   c. depth your thumb goes into the clay when you open the hole
   d. none of the above

5. Where should the pressure be placed with your left hand when centering the clay?

   a. 3 o'clock
   b. 6 o'clock
   c. 9 o'clock
   d. 12 o'clock

B. Directions: Read each question and decide if they are true or false. Mark your answer in the blank provided.

____ 1. You tuck your elbows against your body to insure good support while throwing.

____ 2. When attaching the clay to the wheel head, the bullet point goes up.

____ 3. Grog is added to your unwedged clay to give it more solidness.

____ 4. The walls of the pot should vary considerably from the top to the bottom.

____ 5. When you "choke" the walls of your opened pot, this will give it more height.

____ 6. It is necessary to trim the top of your pot even at all times to aid in trimming a foot on the bottom.

____ 7. The top rim should be on a slight level outward. This is pleasing to the eye when completed.

____ 8. Adding water to the clay, after it has become attached on the wheel head, will make slip and weaken the vessel.

____9. Removing the pot from the wheel head is made easier by means of a string and lifts.

____10. When you trim the uneven top off the constructed vessel, the pro-tool should point in the direction of the motor rotation.

APPENDIX B

KEY -- "THROWING ON THE POTTER'S WHEEL"

A. Multiple Choice

1. b
2. d
3. a
4. c
5. a

B. True and False

1. true
2. false
3. false
4. false
5. true
6. true
7. true
8. false
9. true
10. true

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