

The Effect of Applying Color and Light Training Materials on the Female First Grade Students' Learning Outcome of Persian Language Lessons in Sharoud

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ABSTRACT:

The color images raise the level of educational by providing more detailed information; therefore, these images are believed to be effective in gaining a deeper understanding of the lessons. Moreover, Proper lighting enhances students' learning and performance. This study aimed at assessing the impact of training color and light materials on elementary school girls' attention and learning in Persian language lessons. This type of research was the semi-experimental design in which pre-test - post-test were administered on two independent experimental and control groups. The data collection was done through random cluster sampling. To collect the required samples two primary first-grade classes were used. Experimental groups were under the influence of experimental materials and tools for color and light and control group influenced by materials and tools for Black and White and no special lighting. The test was administered in 12 sessions for each group. The following data collection tools were applied in this study:

- ✓ Research test (to determine students' learning process)
- ✓ Attention test (to determine students' learning attention)

The collected data were analyzed by covariance statistical tests. The scores obtained by students in the learning and attention tests were used to assessed their learning and attention The statistical analysis of data confirmed both the research hypotheses ($\alpha = 0.5$) as statistical results showed that:

- ✓ The effect of light and color would increase students' attention (the experimental group gained higher average scores)
- ✓ The effect of light and color would enhance students' learning (the experimental group gained higher average scores)

It is believed that further research on the effect of color and light training materials on students' attention and learning will significantly improve the quality of teaching practices.

Keywords: *Color and light, Attention, Elementary school*

INTRODUCTION

In modern psychology "color" leaves a special mental and physical effect on people (Luscher, 1373). When one looks at an object it is color which draws a lot of attention (Fower, 1375). Using colors in education especially in elementary levels not only increases student

focus level but also activates the nervous system processes. Moreover, the positive improvements in learners' problem solving skills will prolong the learning stability (Longo, 2001). By avoiding a steady environment, color prolongs the period of focus and attention and through mental

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stimulation increases the delicacy and use in students (Fielding, 2006). Using color to draw attention and to strengthen new ideas is very useful. It can be used to emphasize the main ideas and content (Warner and Meirs, 2010). Primary and secondary pure colors are strong attention drawers and strong carriers of the meaning (Basel and Bernier, 2005). Orange and red (warm and shining colors) draw attention more than any other color. It can be said that red is the color which draws attention the most and more than any other color (Sanhauser and Domas, 2008). Light affects the environment more than anything else. To see an object light must travel to the object and then reflecting light must come back to our eyes (McNal and Christopher, 2009). And color owes its life to the light. In fact, light and color have an interactive relationship with each other (Angeli, 2008).

Suitable light gives people a better compatibility and conformity ability and increases learning and performance (Luafur and Hauras, 2009). Light deficiency leads to the decreased performance and consciousness level (Iscra and Smith, 2008). Using natural lighting and optimal use of the artificial lighting in educational environments enforce conscious and unconscious memory as well as increasing the educational performance between 13-26% (Kobra, 1382). Attention affects non-oral memory, learning level, scores in exams and intelligence tests significantly (Researchers of Nevada University, 2010). It seems that for an optimal attention 10 to 20 minutes is enough, while 30-minute periods result in a higher rate of lack of attention (Holms and Pellegrini, 2005).

RESEARCH METHOD

The Population

In this study population consists of the female students in the elementary schools in the educational year of 1388-1389. A multi-step cluster sampling method was applied in the study. The study subjects were 48 students of two first grade classes. Data gathering tool were:

- ✓ Researchers-made test to determine the level of learning in the classroom: the test included 20 questions which were set in accordance with the contents of the class. The test group was subjected to experimental factors (colorful educational tools and material and light) and evidence

group was subjected to different factors (black and white educational tools and material without lighting). The level of learning with and without lighting and color was studied through the analysis the scores of students and other information. The experts, who had a say in defining the content, confirmed the test validity by analyzing every single question in the questionnaire. The researchers used re-testing to measure questionnaire's reliability. Correlation coefficient gained averages was 90% which meant the reliability was quiet suitable.

- ✓ Attention test to measure the level of students' attention in total process of learning in the classroom: the expert-made test consisted of 10 questions to measure the attention level, with the general criteria of yes or no. The text reliability and validity was approved. A pre-test was run before teaching with colors and lights.

Then researcher provided the teacher with the material and tools. The environment was a class with a great set of artificial and natural lighting. The curtains were of thick light brown type. They were replaced with light blue curtains which were very thin. The benches were placed in a place with good natural light and educational equipment like TV and alphabet chart were also placed in places which prevent staring and avoid reflecting. To combine natural and artificial lights, fluorescent light bulbs with the temperature range of 3500-4100 were used. To prevent disturbing lights on the board direct light in the aforementioned bulbs was used. At the end of education period post-test was ran and according to the results of pre-test and post-test and also scores from tests the effects of colorful material were studied (table 1). Using the attention test result from the two groups of test and evidence, the effects of lighting and colorful material on the attention level was studied. To coordinate the two groups of test and evidence the researchers tried to control factors like gender, teaching hours, teaching duration, teaching methods, physical quality of the classes like moving images, the quality of benches and other factors affecting learning level. After coordinating these factors teaching was started and lasted for 12 hours.

Table1: Outlines the research

	Pre-test	Independent variable	Post-test	Randomly selected subjects
Test group	T1	X	T2	RS24
Evidence group	T1	Y	T2	RS24

Table 2: Statistical indexes of scores of attention for the two groups

Group	Position	Number	Min	Max	Mean	SD	Standard error of the mean
Test group	pre-test	24	0	10	4.95	3.41	0.698
	post-test	24	5	10	8.7	1.45	0.297
Evidence group	pre-test	24	1	10	6.2	2.16	0.442
	post-test	24	0	10	6.37	1.55	0.520

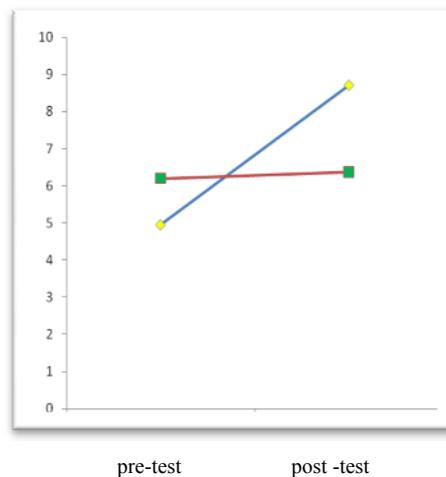


Figure 1: Mean of attention for the two groups in pre-test and post-test

RESULTS

Data Description

Table 2 indicates the scores of attention for the two groups. The least score in attention test of test group was 0 and the most was 10. The average attention test of test group in pre-test was 4.95 with the standard deviation of 3.41. In the post-test the least score in attention test of test group was 5 and the most was 10. The average score in attention test for the test group

was 8.70 with the standard deviation of 1.45 in the post test. For the evidence group the least score in the attention test was 6.20 with the standard deviation of 2.16 in the pre-test. And in the post-test the least and the most scores were 0 and 10 respectively. The average was 6.37 with the standard deviation of 1.55. (table 2 and figure 1).

Table 3 shows the learning level in the post-test and pre-test of the two groups. The least score for the teaching level of the test group in the post-test was 15 and the most was 20. The average score for the teaching level for the test in the test group was 18.18 with the standard deviation of 1.34. In the post-test the least and the most score for the teaching level in the test group were 18 and 20. Also the least and the

most score for the evidence group were 16 and 20. The average for the evidence group on the pre-test was 18.66 with the standard deviation of 1.60. In the post-test the least and the most scores were 15 and 20. The average for the teaching level for the evidence group in the post-test was 18.67 and the standard deviation of 1.50 (table 3 and figure 2).

Table 3: Statistical indexes of scores of learning level in the post-test and pre-test of the two groups

Group	Position	Number	Min	Max	Mean	SD	Standard error of the mean
Test group	pre-test	24	15	20	18.18	1.34	0.273
	post-test	24	18	20	19.66	0.545	0.111
Evidence group	pre-test	24	16	20	18.66	1.6	0.327
	post-test	24	15	20	18.67	1.5	0.306

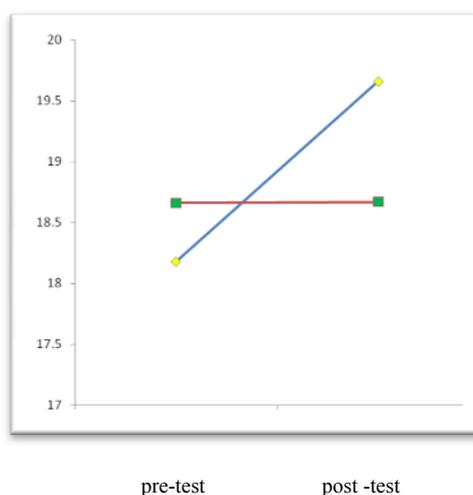


Figure 2: Mean of learning level for the two groups in pre-test and post-test

The First Hypothesis

Students using the greater lighting and colorful tools in the Persian literature paid more attention to the teacher than the students in the black and white environment. For the statistical analysis of the hypothesis covariance test was used. The results are presented in table 4.

Regarding the figures in the table 4, pre-test has greatly affected the post-test ($p=0.001$) (table 4). This means that in the pre-test the average of scores of the attention test in the two groups is different (as you can see in the table 2, the average score of attention test in pre-test for the test group was 4.95 standard deviation of 3.14 and the average score of the evidence group in the pre-test was 6.20 with the standard deviation of 2.16) (table 2). The averages were significantly affected after controlling the elements ($P=0.001$) (table 4). This means that in the averages of post-tests in the both groups, the averages are significantly different (as you can see in table 2, the averages in the scores of attention test in the evidence group in the post-test were 8.70 with the standard deviation of 1.45 and the averages of the attention test in the evidence group in the post-test were 6.37 and the standard deviation was 1.55) (table 2). The result is that the interference of the independent variable is effective and the first hypothesis was approved.

The Second Hypothesis

The level of learning Persian literature course is more in students who are learning through light and colorful objects in comparison with students who are learning in a non-lighting environment with black and white tools. Covariance coefficient was used to statistically test this hypothesis results of which are presented in table 5.

According to the results presented in table 5, pre-test has affected the scores significantly ($p=0.001$) (table 5). This means that in the pre-test the level of learning was different between the two groups of evidence and test (as shown in table 3 then average learning level for the test group in the pre-test was 18.18 and the standard deviation was 1.34 and for the evidence group they were 18.66 and 1.60 respectively) (table 3). Pre-test effect on the average score of the group (or independent variable) increased considerably ($p=0.001$) after statistical controls (table 5). This means that in average, post-test for the learning level was different between the two groups (as you can see in the table 3 the learning level in the test group in the post-test was 19.66 with the standard deviation of 0.545 and for the evidence group they were 18.67 and 1.50 respectively) (table 3). The conclusion is that the interference of independent variable was effective and the second hypothesis is approved.

Table 4: Results of covariance analysis to compare averages for the attention scores

Dependent variable	Source of Effect	Sum of square	df	Mean of square	F	Sig
attention	Pre-test	78.72	1	78.72	35.6	0.001
	Group	98.56	1	98.56	40	0.001
	Error	110.86	45	2.46		
	Total	2994	48			

Table 5: Results of statistical tests to compare the level of learning

Dependent variable	Source of Effect	Sum of square	df	Mean of square	F	Sig
Level of learning	Pre-test	37.95	1	37.95	82.45	0.001
	Group	19.56	1	19.56	42.49	0.001
	Error	20.71	45	19.56		
	Total	17704.4	48	0.460		

DISCUSSION

Designing and codifying educational content as one of the most important factors in teaching has always been in a major focus to the people in charge. The degree by which an effective content can be achieved can be improved through using colorful and attractive teaching material and tools which can draw students' attention to themselves. Also, the time and the energy put in the environment are very important. Unfortunately students in elementary school students usually care much about spelling and reading and writing correctly and do not think much about the contents of the books. As 75% of learning happens through sight, it is believed that more color and lighting leads to happiness and more understanding and increases students' creativity. The application of natural lighting beside optimal use of artificial lighting in the educational environments is an effective factor in learning quality as it increases students' concentration. This study was conducted having this hypothesis in mind that the learning level and attention is different between the two groups one of which uses colorful teaching tools and lighting the other one using black and white tools with no lighting. The results show that the learning level and attention level is significantly higher in students who are subjected to lighting and use of colorful tools. Having approved the first hypothesis, this results leads to the conclusion that colorful tools and lighting indeed have certain degree of influence on learning and focus. Thus the present study recommendations are the followings.

RECOMMENDATIONS

1. Comparing the effects of teaching with the use of lighting and colors on learning and focus between male and female students.
2. Studying the effects of teaching with the use of color and lighting on students with learning difficulties.
3. Studying the effects of teaching with the use of color and lighting on students of higher levels.

LIMITATIONS

Limitations out of control were as follows:

1. The control of personal differences like intelligence, motivation, and teacher's knowledge was not an option in this study.

2. Controlling the relationships between then teachers and students and students with each other was not an option either.
3. The after school activities were out of control.

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