The Effect of training materials to help color and light, on the amount of attention and learning Persian language lessons in elementary school girls in the first grade in Sharoud city

Dr. Hasan Asadzadeh [1], Dr. Nourali Farokhzadeh [2], Yasamin Amini Moghadam [3]

[1]Faculty of Psychology and Education , Allameh Tabatabai University ,Tehran, IRAN.
[2]Faculty of Psychology and Education , Allameh Tabatabai University ,Tehran, IRAN.
[3] Master of Educational Psychology, Faculty of Psychology and Education , Allameh Tabatabai University ,Tehran, IRAN.
moghadam_yasamin@yahoo.com

Abstract: The color images show more details and to raise levels of educational information and is effective in gaining a deeper understanding. Proper lighting also will enhance learning and performance and will help to individual and situational analysis. This study aimed to assess the impact of training materials to help color and light, the amount of attention and learning Persian language lessons in elementary school girls first base began. This type of research was the semi-experimental design in which pre-test - post-test with two independent experimental and control groups, was dealing with Sampling in this study, sampling wascluster. Thus, the first among fifty seven primary schools in two school girls anymore city were randomly selected. Then, between these two classes first elementary school, two classes were selected randomly. Sample obtained consists of two primary first class and the number of students per class, 24 people were. Experimental groups under the influence of experimental (materials and tools for color and light), and control group, influenced by factors different from those (materials and tools for Black and White and no special lighting) groups. Run the test period, 4 weeks and 3 sessions per week (total of 12 sessions for each group).Tool to collect data in this study were:1 - test the research and determine the learning process of students learning in the classroom. 2 - Attention test, to determine the amount of attention Dr fraynd students learning in the classroom. Then, statistical analysis, data collected from samples with statistical tests analysis of covariance were analyzed. In this study, using the scores obtained by students in the learning and test data from tests of attention, to assess student learning and attention was paid .Statistical analysis of data in both the research hypothesis, with 05/0 =α, were confirmed. Statistical results showed: 1-Average scores in the experimental groups according automatically mean scores significantly higher than in the control group was considering. This result shows the effect of light and color is increased attention to students.2 - Average scores of students learning in the experimental group significantly higher than average scores automatically learning students in the control group had. This result shows the effect of light and color is on increasing student learning. Since the color in the learning environment improves visual processing, visual thinking, problem solving process and increase Creativity. Also the proper light increases the body's level of consciousness and cognitive performance. Therefore, research on the effect of training materials to help color and light, on the amount of attention and learning will help significantly improve the quality of teaching and learning.

Keywords: color and light, attention, elementary school.

Introduction

In modern psychology "color" leaves a special mental and physical effect in people (luscher, 1373). When looking is passive color is the only thing which draws a lot of attention (fower, 1375). Using colors in education especially in elementary levels not only helps student focus more but also using it in a more complicated level can help the nervous system process better and more active. These positive effects and improvements in problem solving in learners, will prolong the learning stability (longo, 2001). Avoiding a steady environment, color prolongs the period of focus and attention, and through mental stimulation, increases the delicacy and use in students (fielding, 2006). Using color to draw attention and to strengthen new ideas is very useful. Also we can use color to emphasize the main ideas and contents with a greater importance. For instance, to give a phrase or a word, a greater importance with emphasis colors can be used (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 (worm 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 (sanhaufer 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 helps people for a better compatibility and conformity and increases learning and performance (luafur and hauras, 2009). Light deficiency, leads to decrease of performance and level of consciousness (Iscra and smith, 2008). Using natural lighting and optimal use of the artificial lighting in educational environments can help conscious and unconscious memory and increase 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, pellegrini, 2005).

Methodology
The population
In this study population consists of female students of first grade in elementary schools (1720 student) in the educational year of 1388-1389 in state universities. Sampling method in this study was multi-step cluster sampling. So, first two schools were chosen among the 57 elementary feminine schools. Then among the first graders two were chosen. The sample consisted of two classes and 24 student in which. Data gathering tools are:

self- made test by the researchers to determine the level of learning in the classroom. The questions were 20 questions which were set in accordance with the contents of the class. In this study, test group were subjected to experimental factors (colorful educational tools and material and light) and evidence group were subjected to different factors (black and white educational tools and material without lighting). Finally using the scores of students and other information gathered using the test the level of learning with and without lighting and color was studied. To set the content, experts had a say. To measure creditability, experts were consulted with. In the aspect of content 4 elementary school teachers analyzed every single question in the questionnaire (content creditability). Also to measure reliability re-testing was used. Thus, a week before the test a sample of 30 people was chosen and after a brief training test was ran. After two days the same participants were tested again. Correlation coefficient

gained between the two averages was 90% which means the reliability is quiet suitable.

Attention test to measure the level of students' attention in total process of learning in the classroom. Questions consisted of 10 questions to measure the attention level, with the general criteria of yes or no. it was marked and filled by the researcher. This test was designed by Mr. MohamadNia (1380) and the reliability and credibility are approved. first before teaching with colors and lights, pre-test was ran. Then researcher provided the teacher with the material and tools. Also the environment was found through locating 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. Also using the attention test's 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 we tried to control factors like gender, teaching hours, teaching duration each time, the teachers themselves, teaching methods of them, and 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.
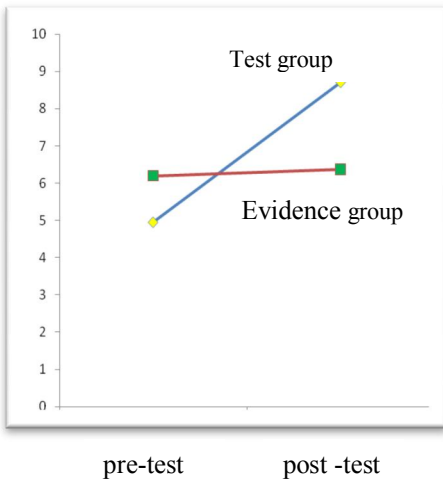
Table1: outlines the research

	pre-test	Independent variable	post-test	Randomly selected subjects
test group	T1	X	T2	RS24
evidence group	T1	Y	T2	RS24

Data description
Statistical indexes: in table 2 you can see the scores of attention for the two groups.(This Table is end of article). As you can see in table 2: 24 students were in test group and the same amount were in the evidence group. 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.

pre-test   post -test

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.
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
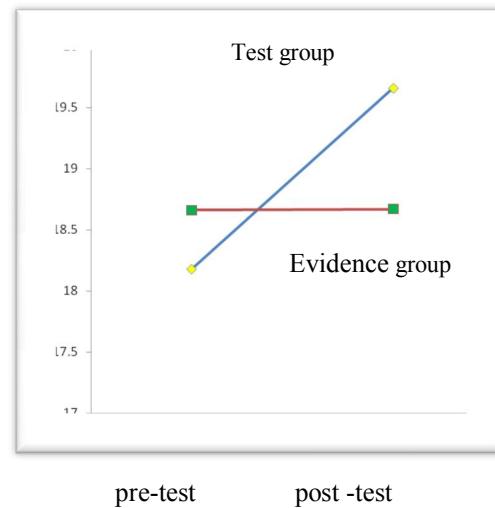
hypothesis covariance test was used. The results are presented in table 4. .(This Table is end of article).

Regarding the figures in the table 4, pre-test has greatly affected the post-test (p=0.001). 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 4-1, 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). Also you can see that after controlling the pre-test .... were .... that in .... s, the .... see in .... ntion .... 8.70 .... rages .... post- .... 1.55). .... ndent .... was

pre-test   post -test

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

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. .(This Table is end of article).

According to the results presented in table 5, pre-test has affected the scores significantly (p=0.001). 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 4-2 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). Also you can see that after statistical controls, pre-test's effect on the average score of the group (or independent variable) increased considerably (p=0.001). This means that in average,

post-test for the learning level was different between the two groups (as you can see in the table 4-3 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). The conclusion is that the interference of independent variable was effective and the second hypothesis is approved.

1.   .

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

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

Table 4: the 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 the center of focus by the people in charge. The degree by which an effective content can be achieved can be improved 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 is very important. Unfortunately there is a common mistake among the students who care much about spelling and reading and writing correctly but they do not think much about the contents of the books. This happens in elementary school students. Regarding the fact that about 75% of learning happens through sight, more color and

lighting leads to happiness and more understanding and also it increases creativity. And regarding the fact that knowing the advantages and using natural lighting beside optimal use of artificial lighting in the educational environment is of effective factors in learning quality and increasing 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 this conclusion that

colorful tools and lighting indeed have influence on learning and focus. Other studies in this field are in consistency with our results, and even in those which are not we can find some results which can be approval of ours. Therefore first we should use lighting and colorful tools to attract the focus and improve learning level. And then we can lead their education and have high hopes about their futures. Today having known the results of this study and others in this field, using colors and lighting in teaching is a necessity. Thus we wish to make this suggestion to the authorities, especially those involving designing the content, to use this results to improve education level both by quality and quantity.

Suggestions
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, the teacher and teacher's knowledge, was not an option in this study.
2. Controlling the relationships between then teacher and students and students with each other was not an option either.
3. The limitations in our actions in teaching with after school activities were out of control.

References
2. Agha Mohammad Nia, P.. (1380). "The effect of color images based on the content of teaching, learning and achievement for fifth grade students in English language teaching. "
3. Anderson JR. (1980). Cognitive psychology and its implications. San Francisco: Freeman.
4. Bascle, B.,Bernier, O.,Lemaire, V.(2005). A Statistical approach for learning invariants (application to image color correction and learning invariant to illumination).
5. Belfior,J.P, Grskovic, A.J. Murphy, M.P, Zentall, S.S . (1996). The effects of antecedent color on reading for students with learning disabilities and co- occurring attention- deficit hyperactivity disorder. Journal of learning disabilities.
6. Ethan, yohannes. (1967). Coloring Book, translated by Mohammad Hossein Halimi, Tehran: Ministry of Islamic Guidance
7. Favr, Jane Powell. (1375). "Color packaging", translated by shabnam farai, Tehran
8. Fielding, R. (2006). Learning , lighting and color (Lighting design for schools and universities in the 21 century). AIA.
9. Grangaar. D.E. (1995). Color and light effects on learning assocication for child hoed education international study conference and exhibition Washington.D.C.
10. Grangar.D .E. (1993). Effects of color and lighting on selected elementary students . Nevada university.
11. Holmes, M.R., Pellegrini, D. A., Schmidt, L.S. (2005). The effects of different recess timing regimens on preschoolers classroom attention. Monmouth university, new fersey, U. S. A, university of Minnesota, twin cities, compus, U. S. A.
12. Hrgnhan, no. RSS. And Olson, MS. HTML. (1386). "An Introduction to Theories of Learning", translated by Saif Ali ,Seventh edition, Tehran: Publication douran.
13. Irena, I. G., Smith, L. (2008). Daytime intermittent bright light effects on processing of laterally exposed stimuli, mood, and light perception, Institute of psychological science, university of leeds. United kington.
14. K., Ali Asghar. (1382). "Bright ideas in educational applications".
15. Khandan Dell behrooz. (1386). "The effect of color and special effects training videos on how students learn science, fourth grade", master's thesis, Allameh Tabatabai University.
16. Krall ,M.R., Christopher,E.J.,Atwood.R. (2009).Comparison of central Appalachian in –service elementary and middle school teacher understaning of selected light and force and motion concepts
17. Lizso, D. S., Lango, E., Laufer, M. A, Suplicz, M. S., Horvath, M. S. (2009). Psychophsiological, performance and subjective correlates of different lighting conditions. Department of ergonomics and psychologu, Budapest university of technology and economics.
18. Longo. J.P., (2001). What happens to student learning when color is added to a new knowledge representation strategy?
19. Lvchr, Max. (1373). "Color Psychology", translated by M. Vida abizadeh, Tehran: Dorsa.

20. May MA, Lumsdaine AA. (1958). Learning from Films. New Haven: Yale University Press;.

21. Mellinger BE. (1932). Children's interest in pictures. New York: Bureau of Publication, Teachers College, Columbia University

22. Parsons, Richard, and Hynsvn, Stephen, and Brown Sardo Dybvra. (1385). "Educational psychology: research, teaching, learning", translation doctor Asad Hassan Zadeh, Hossein Eskandari, Tehran: Abed.

23. Researchers from university of Nevada. (2010). Sensitivity of the test of memory and learning to attention and memory deficits in children with ADHD, Journal the clinical neuropshologist can be contacted at: Taylor & Francis group, Oxford ox14 4RN united kingdom.

24. Sandhofer, M.C., Doumas, A.L. (2008). Order of presentation effects in learning color categories . Journal of cognition and development.

25. Valanides, N., Angeli, C. (2008). Distributed cognition in a sixth- grade classroom: an attempt to overcome alternative conceptions about light and color. Journal of research on technology in education, University of Cyprus.

26. Vandermeer AW. (1954).Color vs. black and white in instructional films. Educational Technology Research and Development;2(2):121-134.

27. Warner, S. A., Myers, L. K. (2010). The creative classroom (The role of space and place toward facilitating creativity). The technology teacher.

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