

The Effect of the Color Alert Strategy on English Language Achievement among Fifth-Grade Female Pupils

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- Abstract :

The research problem lies in the low level of achievement of English among female pupils in grade five as well as the use of traditional teaching methods without effectively activating the attention of the students and organizing information. This calls for the use of a more effective instructional strategy such as the Color Alert Strategy. This study aims to investigate how effective this is to improve pupils' achievement in English. The experimental design type used is partial control with the sample (66) pupils where they were divided into two groups, which is an experimental group and a control group. The Color Alert Strategy was used to teach the experimental group and the traditional method to the control group. To assess the pupils' performance at the end of the experiment an achievement test was produced. It was checked for validity and reliability and data was analyzed accordingly to the appropriate statistical methods. Results showed statistically significant differences in favor of the experimental group suggesting that the Color Alert Strategy increased academic achievement. Furthermore, the strategy boosted pupils' motivation, gave visual input to information and to improve interaction in the class. From the above results it is recommended that this method is applied in the teaching of English in primary schools and the teachers are trained in the use of this method.

-Keywords: Color Alert Strategy, Achievement, Primary Stage.

أثر استراتيجية تنبيهات اللون في تحصيل مادة اللغة الإنكليزية لدى تلميذات الصف الخامس الابتدائي
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المستخلص : تكمن مشكلة البحث في انخفاض مستوى التحصيل الدراسي في مادة اللغة الإنكليزية لدى تلميذات الصف الخامس الابتدائي، فضلاً عن استخدام الطرائق التدريسية التقليدية دون تفعيل فاعل لانتباه التلميذات وتنظيم المعلومات المقدمة لهن. وهذا ما يستدعي اعتماد استراتيجية تدريسية أكثر فاعلية مثل استراتيجية تنبيهات اللون. ويهدف هذا البحث إلى التحقق من أثر هذه الاستراتيجية في تحسين تحصيل التلميذات في مادة اللغة الإنكليزية. وقد استخدم تصميم تجريبي ذي ضبط جزئي، إذ بلغت عينة البحث (٦٦) تلميذة، وزعن على مجموعتين: تجريبية وضابطة. واستخدمت استراتيجية تنبيهات اللون في تدريس المجموعة التجريبية، في حين درست المجموعة الضابطة بالطريقة الاعتيادية. ولتقويم أداء التلميذات في

نهاية التجربة، أُعد اختبار تحصيلي، وتم التحقق من صدقه وثباته، ثم عُولجت البيانات باستعمال الوسائل الإحصائية المناسبة. وأظهرت النتائج وجود فروق ذات دلالة إحصائية لصالح المجموعة التجريبية، مما يشير إلى أن استراتيجية تنبيهات اللون أسهمت في رفع مستوى التحصيل الدراسي. كما ساعدت الاستراتيجية على زيادة دافعية التلميذات نحو التعلم، وتنظيم المعلومات بصرياً، وتحسين التفاعل داخل الصف الدراسي. وفي ضوء هذه النتائج، يوصي البحث باعتماد هذه الاستراتيجية في تدريس اللغة الإنجليزية في المدارس الابتدائية، فضلاً عن تدريب المعلمين والمعلمات على كيفية توظيفها في العملية التعليمية.

■ **الكلمات المفتاحية:** استراتيجية تنبيهات اللون، التحصيل، المرحلة الابتدائية.

Chapter One: Introduction to the Research

First: Research Problem

English is regarded as one of the foundation subjects at every stage of schooling as it is crucial for learners to establish language competence and communicate to learn new words and language structures that are essential for successful learning. The educational situation in Iraq showed that students' achievement in the subject was weak, especially at the primary level, which is a sign of the weakness of the teaching methods used.

This is confirmed in Iraqi studies, in which Yasin (2016) found that students' English language achievement dropped, and comprehension and understanding problems were found, and there were clear difficulties in students' oral skills in school. This indicates that the issue is ongoing at various educational levels. The results also show that the traditional teaching method is still dominant, in which the students rely on memorization and repetition without applying any modern teaching method that fosters the activation of the student's attention and information organization.

From the researcher's observation and experience, it is clear that pupils have problem understanding the meaning of the words and language structures in the learning process, resulting from poor interaction in the classroom and overlapping the information in learning by the teacher, which leads to low learning achievement.

Given the above, it is evident that methods of modern teaching that use visual organization and attention enhancing techniques, such as the Color Alert Strategy, should be used to improve comprehension and academic achievement.

Thus, the problem statement of the research is presented as a question:

-Does the Color Alert Strategy have an impact on the English language performance of 5th grade female students?

Second: Importance of the Study : Education is a system of learning that is designed to cultivate the minds, emotions, and abilities of individuals. Education goals are the primary ways in which teaching is manifested. Today, the concept

of teaching is not just about transferring knowledge, but is perceived as a process of interaction with students, wherein students actively build knowledge, develop their intellectual abilities. Hence, the need for using modern teaching strategies to attain objectives of learning effectively is an absolute need (Zaytoon, 2007, p. 18).

In this view, achievement is seen as a measure of how much and how well the learner has learned, and thus is considered one of the most significant indicators of educational success. There are various factors that affect achievement, and teaching methods, and learner participation, play a central role. From the available educational literature it has been found that the traditional teaching-learning approach that depends on memorizing and reciting data in a classroom causes a decrease in student achievement, while the modern teaching-learning approach that is interactive and uses instructional stimuli increases the achievement of students. This underscores the need for the use of novel teaching methods that can somehow overcome such shortcomings (Abu Jado, 2003, p. 18).

The concept of instructional strategies is significant in this context, because is they offer a systematic framework that helps teachers' classroom actions and at the same time they manage interaction among the components of the educational process, in order to achieve the desired learning goals. The modern education trends have emphasized the importance of strategies that can capture students' interest, structure information and support learning processes. One of these strategies is the Color Alert Strategy which helps students differentiate between concepts and find the key elements of the instructional content and therefore increase their understanding and achieve academic success (Attia, 2009, p. 18).

This orientation is even more important when taking into account the nature of the primary stage that forms the basis on which learners' knowledge and language skills are built. Therefore, instructional practices at this level need to be appropriate for the developmental characteristics of the learners, and need to make the most of their visual learning style and interest in activities that capture their attention. In addition, if there is a lack of achievement in one of these levels, this could impact on pupils' achievement in future levels of education. It is thus crucial to use contemporary pedagogical methods that can help overcome the aforementioned weaknesses at an early stage (Qatami, 2005, p. 18).

It is clear that this is a significant issue when considering only fifth grade primary school children. In this stage, students will be faced with a more significant level of English vocabulary and more complicated language patterns, therefore the supportive learning process that is provided must be based on the modern approach of learning that can increase students' attention and improve the effectiveness of learning. In this perspective, the Color Alert Strategy can assist in the acquisition of vocabulary and language structures, increase understanding and retention, and ultimately boost students' academic performance (Al-Zayyat, 2001, p. 18).

The importance of the current research can be summarized as below:

The post-modern view of education considers teaching to be an interactive activity which seeks to foster active learning and not simply the transfer of knowledge.

Academic achievement is a key indicator of educational success and the instructional approaches that are used have a direct impact on achievement.

The Color Alert Strategy helps focus the pupil's attention, structure information and improve learning.

The primary stage is a very important base for language development, and therefore requires the utilization of modern teaching methods and techniques that are compatible with learners' developmental characteristics.

Fifth-grade primary school pupils require engaging instructional strategies that can help improve their achievement in English language learning.

Third: Research Objective and Hypothesis

The present study aims to investigate the effect of the Color Alert Strategy on the achievement of fifth-grade primary school pupils in English language. This is achieved by examining the extent to which pupils are able to acquire, comprehend, and apply vocabulary and language structures when taught through the Color Alert Strategy compared with the conventional method of instruction.

To achieve this objective, the following null hypothesis was formulated:

There is no statistically significant difference at the (0.05) level between the mean achievement scores of the experimental group, which will study English language using the Color Alert Strategy, and those of the control group, which will study the same subject using the conventional method, on the achievement test prepared for the purposes of this study.

Fourth: Delimitations of the Study

Human Delimitation: Fifth-grade primary school pupils.

Spatial Delimitation: Primary schools affiliated with the Directorate General of Education, Baghdad / Al-Karkh Second.

Temporal Delimitation: The first semester of the academic year 2025–2026.

Content Delimitation: The prescribed topics included in the English language textbook for the fifth grade of primary school that will be taught during the experimental period.

Fifth: Definition of Terms

Effect : Theoretical Definition: Effect is defined as “the amount of change that occurs in the dependent variable as a result of the influence of the independent variable” (Al-Saadoun, 2012, p. 23).

Operational Definition: In the present study, effect refers to the degree of improvement in the achievement of fifth-grade primary school pupils in English language resulting from the use of the Color Alert Strategy.

Color Alert Strategy : Theoretical Definition: The Color Alert Strategy is an instructional strategy that employs colors in a purposeful and systematic manner to highlight important information and direct learners' attention to key elements

within instructional content, thereby facilitating comprehension and retention (Ambu Saeedi & Al-Hosni, 2016, p. 102).

Operational Definition: In this study, the Color Alert Strategy refers to the instructional procedure employed by the researcher in teaching English language to fifth-grade primary school pupils through the use of specific colors to distinguish vocabulary items, language structures, and grammatical rules during classroom instruction in order to enhance attention and improve learning.

Academic Achievement

Theoretical Definition: Academic achievement is defined as “the degree to which a learner acquires the knowledge, skills, and educational experiences specified in the instructional objectives” (Albrecht, 2004, p. 23).

Operational Definition: Academic achievement refers to the total score obtained by fifth-grade primary school pupils on the achievement test prepared by the researcher to measure their understanding of the instructional content following the implementation of the Color Alert Strategy.

Fifth Grader in Primary School : Theoretical Definition: Fifth grade is a grade in primary education that is the first of the grades following the fourth, in which students are taught basic knowledge and skills in a range of subjects taught at school.

The Operational Definition is the children of the fifth grade Primary schools who officially enrolled in the schools included in the study during the school year 2025-2026 and who would be included in the study procedures.

Chapter Two: Theoretical Framework and Previous Studies

Theoretical Framework and Previous Studies

First: Constructivist Theory

Constructivist theory is considered one of the most influential theories of modern education that explain the process of the formation and development of knowledge in the learner. In his work in developmental psychology, Piaget showed that cognitive development is a gradual and sequential process. From this point of view, learning is not simply the storage and retrieval of information; it also involves actively building knowledge from previous learning and experiences. Such a process helps improve the learning abilities of learners in comprehending information, processing knowledge, and solving problems effectively (Babis, 2013, p. 78).

However, from a different point of view, the psychologist, Wilhelm Wundt was also instrumental in the development of structuralism, which sought to analyze conscious experience and the basic elements of mental process such as sensations, feelings, and mental images. Structuralists were especially interested in the way these elements co-operate to create human awareness. This was an introspective method whereby people reflected on and examined their own experiences in order to derive the principles of knowledge organisation, similar to scientists analyzing the elements of natural phenomena (Bada, 2015, p. 87).

Constructivist theory is based on the idea that knowledge cannot be taught directly from teacher to learner. Instead, learners actively build knowledge from their existing schemas as they interact with the new experiences. This interaction allows them to restructure their thinking and come to a cognitive balance. As a result, learning is not just fact giving, but an act of meaning building and conceptualization (Bonwell, 2017, p. 31).

Constructivist theory has implications for the use of educational activities that involve students in various learning tasks while placing them at the heart of learning. These practices support student construction of knowledge, and have positive implications for achievement. The Color Alert Strategy adheres to constructivist principles because it allows students to continually track their learning as well as their understanding of it and their self-confidence in meeting the learning objectives. Consequently, it facilitates meaningful participation and active learning in English language learning classes.

Second: The Color Alert Strategy

The Color Alert Strategy is a new teaching method that allows students to actively engage in the process of self-assessment, to express their degree of understanding and confidence in relation to their learning objectives or answers to questions asked in class. The strategy is based on the use of colored cards resembling traffic-light signals, allowing teachers to diagnose students' learning status quickly and efficiently while providing learners with opportunities for self-reflection and self-regulated learning.

The primary purpose of this strategy is to develop students' self-management skills and encourage them to monitor their own academic progress. In addition, it enhances self-confidence and promotes responsibility toward the learning process. The strategy also enables teachers to identify learners' strengths and weaknesses and to take appropriate instructional actions to address them within the classroom environment (Ambu Saeedi & Al-Hosni, 2016, p. 102).

Steps for Implementing the Color Alert Strategy

1. Lesson Presentation

The teacher presents the lesson content using the instructional method deemed most appropriate. Afterward, students are asked to indicate the degree of confidence they have in achieving the lesson objectives by using the designated colored cards.

2. Determining Confidence in Achieving Lesson Objectives

At the end of the lesson, each student individually raises a card that reflects her perceived level of achievement, as follows:

a. Green Card:

Students raise the green card when they feel highly confident that they have achieved the lesson objectives and understood the content effectively.

b. Yellow Card:

Students raise the yellow card when they believe that they have achieved only part of the lesson objectives and still require further clarification or review.

c. Red Card:

Students raise the red card when they feel that they have achieved only one objective, or none of the lesson objectives, and their confidence in understanding the material remains low.

3. Determining Confidence When Answering Questions

When the teacher asks a question during the lesson, students indicate their confidence level through one of the following responses:

a. Green Card:

Raised when the student is confident that her answer is correct and that she can respond completely and accurately.

b. Yellow Card:

Raised when the student possesses only partial knowledge of the answer or is uncertain about some aspects of it.

c. Red Card:

Raised when the student does not know the answer or feels unable to respond to the question presented by the teacher.

e- Discussion and Feedback

In both situations—whether students are evaluating the extent to which they have achieved the lesson objectives or indicating their confidence in answering classroom questions—the teacher engages them in discussion and provides appropriate feedback. The teacher also works to address areas of weakness and reinforce areas of strength, thereby contributing to the improvement of learning outcomes and the enhancement of students' academic achievement (Ambu Saeedi & Al-Hosni, 2016, p. 102).

Third: Academic Achievement

One of the key elements of the effectiveness and success of the educational process is the level of academic achievement. It is also one of the basic objectives that educational institutions work toward, due to its huge importance in fostering learners' competence and in supporting their learning process. Academic achievement is generally viewed as the outcome of the knowledge, skills, and experiences acquired by learners through organized educational experiences over a specified period of time. Consequently, it is regarded as one of the most important educational outcomes sought by both learners and educators.

Furthermore, academic achievement serves as a major criterion for evaluating educational performance and determining the extent to which educational objectives have been accomplished. Owing to its importance in identifying changes in learners' behavior and performance levels, it has attracted considerable attention from researchers and educators. Understanding these changes can assist in improving current educational objectives and developing new goals that are more responsive to learners' needs (Al-Fakhri, 2018, p. 49) .

Academic achievement is used to determine the degree of success attained by a learner in a particular subject area or field of study. It represents the final outcome of the learning process and is influenced by a number of interrelated factors that directly or indirectly affect learners' academic performance. Although academic achievement is often associated with examination and test results, its scope extends to various aspects of learned behavior that can be measured and evaluated.

Among the most important factors influencing academic achievement are the following:

Intelligence: Cognitive abilities vary from one learner to another, resulting in individual differences in achievement levels.

Motivation: It is very important factor which influences learners' actions and use of their abilities to fulfill educational purposes.

Self-Regulation and Self-Concept: These factors play an important role in organizing learning processes and enhancing academic achievement.

The Degree of Aspiration: Learners' aspirations have a great impact on their effort to succeed and excel.

Home and School Environment: The factors that exist in the educational or social environment of the home or school can either support or impede learning. (Zayer & Samaa, 2023, p. 150)

Fourth: Previous Studies : The researcher was unable to find any previous studies that specifically examined the effect of Color Alert Strategy on achievement in English language among fifth-graders in primary school within the limits of the literature he reviewed.

Chapter Three

Research Methodology and Procedures

First: Research Methodology

Research methodology refers to the systematic scientific plan adopted by the researcher for collecting, analyzing, and interpreting data in order to obtain accurate findings that contribute to addressing the research problem and answering its questions.

To achieve the objectives of the present study, the researcher employed the experimental method because it is considered the most appropriate approach for the nature and objectives of the study. This method is widely recognized for its ability to identify causal relationships among variables and to measure the effect of an independent variable on a dependent variable under controlled and organized conditions.

The researcher adopted a post-test-only experimental design involving two groups: an experimental group and a control group. The experimental group was taught English language using the Color Alert Strategy, whereas the control group was taught the same subject through the conventional teaching method.

This design was employed to investigate the effect of the independent variable (the Color Alert Strategy) on the dependent variable (the achievement of fifth-grade primary school pupils in English language), as illustrated in Figure (1).

Group	Equivalence	Independent variable	Dependent variable	Research Instrument	Significance
Experimental	-Prior Knowledge (20 multiple-choice items).	The Color Alert Strategy	Academic Achievement	Achievement Test	Not sig
Control	-The Daniels Intelligence Test, consisting of 45 items	Traditional Method			

Figure-1-:The adopted experimental design

Second: Population and Sample of the Research

First: Research Population The research population consisted of all fifth-grade primary school female pupils enrolled in governmental daytime primary schools affiliated with the General Directorate of Education in Babylon Governorate/Center during the academic year (2025–2026). The selected school was required to have at least two fifth-grade classes to ensure the applicability of the experimental design adopted in the study.

Second: Research Sample

Al-Azdehar Primary School for Girls was purposively selected as the site for conducting the experiment due to the availability of the necessary requirements for implementing the research procedures, in addition to having two fifth-grade classes. The total number of pupils in the two classes was (69), distributed between Class (A) and Class (B), with (36) pupils in Class (A) and (33) pupils in Class (B).

Using random assignment, Class (A) was designated as the experimental group and was taught English using the Color Alerts Strategy, whereas Class (B) was assigned as the control group and was taught the same subject using the conventional teaching method.

After excluding the repeating pupils from both groups, whose number reached (3) pupils—one pupil from the experimental group and two pupils from the control group—the final sample consisted of (66) pupils, including (35) pupils in the experimental group and (31) pupils in the control group.

Table (1) illustrates the final distribution of the pupils in both the experimental and control groups according to the variables adopted in the study

Group	Independent Variable	Number of Students Before Exclusion	Number of Excluded Students	Number of Students After Exclusion	Total Final
Experimental	The Color Alert Strategy	36	1	35	35

Control	Conventional Method	33	2	31	31
Total	-	69	3	66	66

Third: Equivalence Between the Two Research Groups The researcher was keen to establish equivalence between the experimental and control groups in a number of variables that might influence the research outcomes, thereby ensuring the validity of the experimental procedures and the accuracy of the results. The equivalence variables included prior knowledge in English language and the Daniels Intelligence Test, which consists of 45 items. Both instruments were administered to the pupils of the two research groups prior to the implementation of the experiment. The collected data were then statistically analyzed using the t-test for two independent samples.

It was found that the obtained results did not show any statistically significant difference between the two groups in the above-mentioned variables at a value of 0.05. The calculated values of t for both experimental and control groups were found to be less than the tabulated value of t at 64 degrees of freedom in Table (2) meaning that both experimental and control groups were statistically equivalent with respect to these variables.

Table (2): Independent Samples t-test Results for the Equivalence of the Two Groups in Prior Knowledge and Intelligence Test

Variable	Date of Equivalence Testing	Group	Arithmetic Mean	Standard Deviation	df	The two t-values		Sig
						t-calculated	t-tabulated	
Prior Knowledge (20 multiple-choice items)	23/9/2026	Experimental	11.97	2.43	64	0.52	2.00	Not Significant
		Control	11.61	2.48				
Daniels Intelligence Test (45 items)	24/9/2026	Experimental	30.26	4.37		0.63	2.00	Not Significant
		Control	29.58	3.12				

It is evident from the results presented in Table (2) that the experimental and control groups were equivalent in both the prior knowledge and intelligence variables. No statistically significant differences were found between the two groups in these variables. This equivalence enhances the internal validity of the experimental design and supports the assumption that any differences observed in the post-achievement test can be attributed to the effect of the Color-Cueing

Strategy rather than to extraneous variables or pre-existing differences between the groups.

Fourth: Control of Extraneous Variables :The researcher sought to control a number of extraneous variables that might influence the results of the experiment in order to ensure the validity of the experimental procedures and the accuracy of the findings. These variables included the following:

A. Incidental Events During the Experiment:

No unexpected events or external circumstances occurred during the implementation of the experiment that could have affected its procedures or outcomes.

B. Experimental Mortality:

No cases of withdrawal, transfer, or prolonged absence were recorded among the pupils of either research group throughout the experimental period.

C. Sample Selection:

The experimental and control groups were intentionally selected from Al-Azdehar Primary School for Girls. Their equivalence in the variables related to the study was established before the implementation of the experiment.

D. Physical Conditions:

The experiment was conducted on fifth-grade primary female pupils within the same school. The researcher taught both groups personally while maintaining similar classroom conditions in terms of lighting, ventilation, seating arrangements, and instructional environment.

E. Measurement Instrument:

A unified achievement test was administered to both groups at the end of the experiment to assess the effect of the independent variable on pupils' achievement in English language.

Fifth: Preparation of the Research Requirements

To implement the experiment, the researcher prepared the following requirements:

1- Determining the Instructional Content:The instructional content consisted of the topics prescribed in the English language textbook for the fifth primary grade during the first semester of the academic year (2025–2026), within the limits of the current study.

2- Formulating Behavioral Objectives:

Bloom's cognitive taxonomy was adopted in formulating the behavioral objectives. The objectives were limited to the first three cognitive levels: remembering, understanding, and application. A total of (150) behavioral objectives were developed to cover the instructional content included in the experiment.

3- Preparing Lesson Plans: A set of instructional plans was prepared for both the experimental and control groups in accordance with the specified instructional content. The lesson plans for the experimental group were designed

according to the Color-Cueing Strategy, whereas those for the control group were prepared according to the conventional teaching method.

Sixth: Research Instrument (Achievement Test)

1. Objective of the Achievement Test: The achievement test was designed to measure the achievement of fifth-grade primary female pupils in English language after the completion of the experimental period.

2. Number of Test Items: The achievement test consisted of (40) multiple-choice items, each accompanied by four alternatives.

3. Preparing the Table of Specifications: A table of specifications was constructed in light of the English language topics included in the experiment and the first three levels of Bloom's cognitive taxonomy (remembering, understanding, and application). The relative weights of both the content and the behavioral objectives were considered in determining the distribution of the test items. Accordingly, the final form of the achievement test consisted of (40) items distributed systematically across the instructional content and cognitive levels to ensure adequate representation and content validity. This distribution is presented in Table (3).

Table (3): Specifications of the Achievement Test

Seq	Content (Units)	Pages (No. of Pages)	Relative Importance	Percentage of Levels			Total Questions
				Knowledge	Comprehension	Application	
				45%	35%	20%	
1	Fourth	8	35%	6	5	3	14
2	Fifth	6	26%	4	4	2	10
3	Sixth	5	22%	4	3	2	9
4	Seventh	4	17%	3	2	2	7
Total		23	100%	17	14	9	40

3-Preparing the Test Blueprint:

Preparing the Table of Specifications (Test Blueprint) The researcher prepared a table of specifications for the achievement test in light of the instructional content included in the experiment and the first three cognitive levels of Bloom's taxonomy: remembering, understanding, and application. Relative weights were assigned to the instructional content, behavioral objectives, and teaching time in order to achieve balance and comprehensive representation of the subject matter when constructing the test items.

4- Constructing the Test Items The researcher developed the test items in a multiple-choice format to measure the levels of remembering, understanding,

and application among fifth-grade primary school female pupils in the English language subject.

5-Test Instructions Clear instructions were prepared for the achievement test. The pupils were instructed to read each item carefully, select the correct answer from among the four alternatives provided, and record their answers in the designated answer sheet.

Test Validity The face validity of the test was established by presenting it to a panel of specialists and experts in curricula and teaching methods, English language education, and educational measurement and evaluation. The percentage of agreement regarding the suitability of the test items ranged between (85%–100%), indicating that the items were appropriate for measuring the intended objectives. Content validity was also ensured through constructing the test according to the table of specifications and the previously formulated behavioral objectives, thereby guaranteeing adequate representation of the instructional content.

Pilot Administration of the Achievement Test

First Pilot Administration (Clarity of Items and Testing Time) The achievement test was administered to a pilot sample consisting of (30) fifth-grade primary school female pupils selected from outside the research sample. The purpose was to verify the clarity of the test items and instructions and to determine the time required to complete the test.

The results indicated that the test items were clear, understandable, and free from ambiguity. The average time required to complete the test was approximately (40) minutes.

Second Pilot Administration (Item Analysis) The test was administered to a second sample consisting of (100) fifth-grade primary school female pupils from outside the research sample for the purpose of item analysis and determining the psychometric properties of the test.

The results revealed the following:

A. Difficulty Index

The difficulty indices of the test items ranged from (0.42) to (0.74), which fall within the educationally acceptable range.

B. Discrimination Power

The discrimination indices ranged from (0.29) to (0.68), indicating that the test items possessed good discriminatory ability among pupils of different achievement levels.

C. Effectiveness of Distractors

The statistical analysis showed that the incorrect alternatives attracted a greater proportion of pupils in the lower-performing group than those in the higher-performing group, indicating that the distractors were effective and therefore retained without modification.

D. Test Reliability

The reliability coefficient was calculated using the Kuder–Richardson Formula 20 (KR-20) and reached (0.85), which is considered a good and acceptable level of reliability in educational research.

Procedures for the Final Administration

The pupils of both the experimental and control groups were informed of the date of the achievement test one week prior to its administration. The test was then administered simultaneously to both groups after the completion of the experimental period in order to ensure equivalent testing conditions and fairness between the two groups.

Final Form of the Test

After establishing the validity and reliability of the test and completing the statistical analysis of its items, the achievement test was finalized in its final form, consisting of (40) multiple-choice items. The test was subsequently administered to the pupils of both research groups.

Seventh: Statistical Methods

- t-test for Two Independent Samples: To examine equivalence between groups and test post-test differences.

Formula: $t = (\bar{X}_1 - \bar{X}_2) / \sqrt{(S_1^2/n_1) + (S_2^2/n_2)}$

- Degrees of Freedom: To determine critical t value.

Formula: $df = n_1 + n_2 - 2$

- Arithmetic Mean: To calculate average scores.

Formula: $\bar{X} = \Sigma X / N$

- Standard Deviation: To measure dispersion around the mean.

Formula: $S = \sqrt{\Sigma(X - \bar{X})^2 / (N - 1)}$

- Difficulty Index: To determine item difficulty.

Formula: $P = (R_u + R_l) / N$

- Discrimination index: employed to distinguish between high and low performers.

Formula: $D = (R_u - R_l) / (N/2)$

- Effectiveness of distractors: the ability of incorrect options to effectively differentiate responses within test items.

Formula: $E = (W_l/N_l) - (W_u/N_u)$

- KR-20 reliability coefficient: applied to determine the internal consistency of the test.

Formula: $KR-20 = (k/(k-1)) (1 - \Sigma p_q / S^2)$

- Effect size: used to determine the magnitude of the strategy's impact on the dependent variable.

Formula: $ES = (\bar{X}_1 - \bar{X}_2) / S_2$

- Cooper's formula: applied to compute the percentage of agreement for face validity assessment.

Formula: Cooper = $A / (A + D) \times 100$ (Fraenkel et al., 2022:225)

Chapter Four: Presentation and Interpretation of Results

First: Presentation of the Research Results

The findings indicated that the experimental group pupils, who were taught English using the Big Picture Strategy, obtained higher scores in the post-achievement test than those in the control group who received instruction through the traditional method. This suggests that the strategy exerted a positive effect on academic achievement.

This improvement can be attributed to the strategy's role in enhancing pupils' understanding of instructional content, activating their prior knowledge, and facilitating the integration of new information with previously acquired knowledge, which was reflected in their performance on the post-test.

The following table presents the results of the comparison between the two groups.

Table (4): Arithmetic Mean, Standard Deviation, Calculated and Tabulated t-values for the Experimental and Control Groups' Scores in the Achievement Test

Statistical value Group	Number	Arithmetic Mean	SD	df	The two t values -		Sig
					Calculated t-value	Tabulated t-value	
Experimental	35	31.74	4.12	64	4.38	2.00	Statistically significant
Control	31	26.58	5.21				

Second: Interpretation of the Results

This finding is consistent with several educational studies that have confirmed the effectiveness of active learning strategies in improving students' academic achievement compared with traditional teaching methods. This superiority can be attributed to the interactive classroom environment fostered by these strategies, which enhances students' participation during lessons, stimulates thinking processes, and supports deeper and more stable knowledge construction, unlike traditional approaches that rely mainly on memorization and passive reception of information.

Furthermore, the use of the Color Alert Strategy contributed to increasing pupils' motivation toward learning English by enhancing attention, organizing information through color cues, and helping learners distinguish and categorize linguistic content more effectively. It also activated prior knowledge, enabled the identification of cognitive gaps, and supported bridging these gaps through guided classroom interaction. Consequently, this led to a better understanding of

the subject matter, which was reflected in higher levels of academic achievement.

Third: Effect Size Calculation

The effect size was calculated by dividing the difference between the mean scores of the experimental group ($n = 35$) and the control group ($n = 31$) by the standard deviation of the control group. The obtained value (1.15) indicates a strong effect of the Color Alert Strategy on pupils' academic achievement in English. According to the adopted benchmarks for interpreting effect size values, this result falls within the high effect range, confirming that the Color Alert Strategy had a clear and significant positive impact on improving the academic achievement of fifth-grade pupils.

Table (5): Interpretive Values of Effect Size and Magnitude of Impact

Effect Size (ES)	Interpretation (Magnitude of Effect):
0.01 – 0.09	Very negligible effect
0.10 – 0.29	Small effect
0.30 – 0.49	Moderate effect
0.50 – 0.79	Large effect
0.80 and above	Very large effect

(kiess , 1996 : 164)

Third: Conclusions

1- The use of the Color Alert Strategy had a clear and positive effect on improving the English language achievement of fifth-grade female pupils compared with the traditional teaching method.

2- The strategy contributed to making the learning environment more interactive and organized, which helped develop pupils' thinking skills and increased their participation during the lesson, leading to improved learning outcomes.

Fourth: Recommendations

1- It is recommended to adopt the Color Alert Strategy in teaching English at the primary stage due to its positive impact on enhancing pupils' academic achievement.

2- It is also recommended to include this strategy within teaching methods courses in Colleges of Education and Basic Education, in order to prepare and train teachers to employ it effectively in classroom instruction.

Fifth: Suggestions

1-The effect of the Color Alert Strategy on developing scientific thinking among primary school female pupils in science.

2- The effectiveness of the Color Alert Strategy on English language achievement among intermediate school female students.

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