RES MILITARIS
REVUE EUROPEENNE D ETUDES EUROPEAN JOURNAL OF MILITARY STUDIES
Social Science Journal

The Effectiveness Of The Spatial / Visual Intelligence Strategy In The Achievement Of The Students Of The Institutes Of Fine Arts For Boys And Girls In The Subject Of The Foundations Of Design

By

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Abstract

Design Foundations is one of the main subjects in the Design Department as well as the Institute of Fine Arts, and It was found that the students struggle in understanding this subject due to its difficulty, which prompted the researcher to experiment with the spatial/visual intelligence strategy in simplifying this subject. The study aimed to identify the effectiveness of the spatial/visual intelligence strategy in the achievement of male and female students of the Institute of Fine Arts in the basics of design subject, as well as the differences in achievement according to the gender variable, and for this purpose three hypotheses were formulated. The study was limited to the students of the Institute of Fine Arts / the first stage for the academic year 2022/2023, in addition to the vocabulary of the foundations of design, as it is found in their curriculum.

The study was conducted on three samples from the students of the two institutes of fine arts, the first stage. The first sample was an exploratory sample with a population of (80) male and female students (40 male and 40 female students), the second sample was an experimental sample, and the third was a control sample, each of which had a population of (20) students (10) male and (10) female students, all of whom were taken randomly. In the current study, one tool was used, which is a test that was built according to the steps of the tests, and the number of its paragraphs which was (30) items. The study concluded that the experimental group, which was trained using the spatial/visual intelligence strategy, was superior to the group that was taught by the lecture method. The researcher made several recommendations, including the use of this strategy in teaching difficult subjects.

They suggested conducting a study entitled (The effectiveness of using the strategy of spatial / visual intelligence in the achievement of students of the Department of Art Education in the subject of pictorial composition.

Keywords: visual intelligence strategy; Fine Arts; girls in the subject

Introduction

1- The methodological framework of the research

1-1 Research problem

Male and female students of the Institute of Fine Arts in Diyala Governorate suffer from the difficulty of understanding the foundations of design, and the researcher stood on this while conducting a scientific study on male and female students, as told by those who study this subject in the first stage, as well as in teaching it to girls, and after completing the study, the researcher proceeded to conducting another study that is manifested by

experimenting with a teaching strategy that is the strategy of spatial / visual intelligence, which is one of the strategies of multiple intelligences instead of the method of lectures in which they were studying this subject. مرحبا Therefore, the researcher defined her research problem as (the effectiveness of the spatial/visual intelligence strategy in the achievement of the students of the Institutes of Fine Arts for boys and girls).

1-2 The importance of research and the need for it:

The importance of the research was manifested in the following:

1-2-1 It is the first scientific study to be conducted on the topic of spatial / visual intelligence strategy, according to the knowledge of the researcher in the foundations of design.
1-2-2 The Ministries of Education and the Ministry of Higher Education and Scientific Research benefit, as the former will benefit in the field of developing programs for preparing students of the Fine Arts Institutes, and the latter will benefit in developing art education programs in general - and the fields of design in particular.
1-2-3 The current study constitutes an addition to knowledge in the field of plastic arts in general, and the foundations of design in particular.
1-2-4 This study is of special importance because this course (Foundations of Design) is taught in all departments of fine arts.
1-2-5 The importance of this study comes in part from the fact that its results may serve as an evaluation of the method of lectures that teachers use in teaching these subjects, including the foundations of design in terms of whether they are effective or not.

As the proven effectiveness of the spatial/visual intelligence strategy indicates the ineffectiveness of the lecture method.

1-1 Research objectives:

The current research aimed to know the following:

1-3-1 The effectiveness of the spatial / visual intelligence strategy in the achievement of the students of the Institute of Fine Arts in the basics of design course.

For this, the following hypotheses were formulated:

There are no significant differences at the level (0.05) between the achievement of the students of the Institute of Fine Arts and the achievement of its students in the foundations of design in the pre-test.

There are no significant differences at the level (0.05) between the achievement of the students of the experimental sample and the achievement of the students of the control sample in the foundations of design in the post-test.

There are no significant differences at the level (0.05) between the achievement of the experimental sample students and their female students in the foundations of design in the post test.

1-1 Research limits: The current research is defined as follows:
1-4-1 Students of the two institutes of fine arts in Diyala from the first stage, morning study and in both sexes.
1-4-2 Students of the two institutes of fine arts in Diyala for the academic year 2022-2023.
1-4-3 The basics of design subject as found in the curriculum.
1-2 Defining terms: (effectiveness, design principles, achievement)
1-5-1 Effectiveness: (Davis) defined it in the year (2001) as achieving a desirable thing in behavior according to a specific plan. (Davis, 2001, p192)

And in Al-Mu'jam Al-Waseet (2004), is mentioned as (a description of everything that is active) (The Arabic Language Academy, 2004, p. 665)

In the field of education, (Al-Zoubi and Abdel-Rahman) saw it in the year (2011) as referring to progress, advancement, intellectual, educational and social development, and the degree of achieving the desired goal in the educational process (Al-Zoubi and Abdel-Rahman, 2011, p. 4). From observing the definitions above, the researcher decided that (Davis) year (2001) is the closest to the current study, so she adopted it in the current study.

1-5-2 Design Principles

(Al-Husseini) defined it in (2002) as (the principles and laws of the structural relationship of the artwork, and the organization plan that decides the method in which the elements must be collected, to produce a specific effect. (Al-Husseini, 2002, p. 13)

As for (Abdul Karim) in the year (2006), he saw it as (the rules that describe the relationships between design elements). (Abdul Karim, 2006, p. 13).

And identified by (Ghazwan) in (2001) as (organizing the mechanism of the elements in order to add an expressive value, and a goal related to the function first, and then to the aesthetic. (Ghazwan, 2010, p. 43)

From the observation of the above definitions, we find that the definition of (Ghazwan) (2010) is the most comprehensive of these definitions and the closest to the nature of the current study, so the researcher adopted it in the current study.

1-5-3 Achievement :

(Shehata) defined it in the year (2003) as all that students write, and the skills and methods of school subjects and their adoption by the grades obtained in the tests. (Shehata Al-Najjar, 2003, p. 73)

As for (Obaid) in the year (2004), he saw the achievement as (what the student acquires in terms of knowledge, skills, methods of thinking and abilities to solve problems, the direction of the study decides what, and the achievement is measured by the relationships that he obtains in the test. (Obaid, 2004, p. 317)

And (Abdul-Rahim) in the year (2010) saw it as (the accumulative rate that a student obtains in an educational stage, which expresses a specific outcome of information and the extent of its absorption in terms of its quantity and quality. (Abdul-Rahim, 2010, p. 210).

From the observation of the above definitions, we find that the definition of (Abdul Rahim) (2010) is the most comprehensive and accurate of these definitions and fits the current study, so the researcher adopted this definition in the current study.

2. A Theoretical Framework And Previous Studies

2-1 Theoretical Framework

2-1-1 Spatial and visual intelligence strategy:

This strategy is one of the educational strategies for multiple intelligences, and it appeared for the first time in the year (1983) by the American scientist (Gardner). Multiple intelligences consist of a number of intelligences, including spatial / visual intelligence.

Spatial and visual intelligence requires the availability of a number of requirements, including a degree of sensitivity to natural forms, beauty, and the relationships of consistency between these elements. (Saada, 2018, p. 574).

All these requirements are very similar to the requirements of learning the foundations of design and its laws, and how each of these foundations is formed in the design work or the artwork, which makes research in such a field very enjoyable.

And inferred in the spatial / visual intelligence in the ability of the individual to perceive the visual-spatial world, sensitivity to colors, lines and shapes and the awareness of the relationships between things in the place and not just a vision of them and the visual perception of the place and its forms and the relationships between them. Al-Askari, 2016, p. 291).

There are teaching methods related to this type of intelligence, including:

Visual analysis: This method is based on converting a written text into an imaginary painting, as the teacher asks his students to store pictures and shapes in their minds, and thus enables them to display what is in their minds for any material they remember.

Color alerts: This method focuses on encouraging students to use colors to color the study material, because high sensitivity to colors is often one of the most important features of those who have spatial / visual intelligence, and this method is distinguished by motivating students to develop their spatial / visual intelligence as well as it helps them review the study materials.

Pictorial metaphor: in which the extraction and use of metaphorical images from texts, for example, are constrained to the development of this type of intelligence, as this helps to stimulate the imagination of students and motivate them.

Figurative symbols: This method requires students to draw, as pictures and drawings are of great importance in students' understanding of the topic of the lesson, and the researcher has invested this matter in her teaching of the subject.

Drawing the idea: in which the students use simple drawings that help them understand the main ideas and concepts (Saada, 2018, pp. 575-576).

2-1-2 Design Principles

It is mentioned in the specialized sources that the foundations of design are seven foundations, which are (balance, harmony, contrast, Dominance , rhythm, unity, proportion), however, the curriculum prescribed for students of the first grades in the Institute of Fine Arts counted them (6) foundations and neglected the last (ratio and Proportionality) and the following is a brief explanation of each basis.

Balance: Balance is a state in which the opposing forces are equal, and this is done by feeling the equality of the parts of the artwork, which makes it balanced (Ghazwan, 2010, p. 45).

Balance provides visual distrust to the recipient’s eye, which makes the individual realize the expressive message in the artwork. There are several types of balance, including:

- Balance in color: warm colors are more visible than cool colors, and the greater the color bubble or its brightness, the greater the sense of form (Nobler, 1987, p. 501).

Every design must make a person feel stable and balanced in values and colors, and that a good design must have stability between its different parts so that they appear balanced and stable with each other, as it must be from an element coordinated with the rest of the elements or discordant with them according to its location in the design (Al-Bazzaz, 2001, p. 30).

Harmony: Every work of art has a process of harmony and a process of apparent or hidden contradiction, but some works have the predominance of the phenomenon of harmony and others have the predominance of the phenomenon of contrasts, and that depends on the aesthetic of the design, the nature of the designer, his style and his performance of the meaning (Al-Bazzaz, 2001, p. 36).

And harmony is when the design elements are harmonious in their common characteristics, and harmony mediates two cases, the first is the predominant similarity between the elements, which causes boredom due to the repetition of those elements that bear the same characteristics.

And the second: is the dissonance that causes surprise (Ali, 2011, p. 64).

Contrast: It is the opposite of harmony, and it is considered one of the main pillars in the design work with what it achieves of diversity and visual pleasure, as the contrast means diversity, as it gives life to the design and adds to productive elements that make the design attractive, and that diversity is in size, shape and color (Al-Bazzaz, 2001, p. 39).

Dominance: is one of the important foundations of organization, as it imposes a state of consistency for any part with the overall body according to a specific arrangement. p. 44)

Dominance and focus is achieved through a numerical point that identifies the text with the center of interest in the design, as it is the center of attracting attention. Therefore, the designer puts a specific idea or a dominant line that gives it all the attention and attracts attention (Ali, 2011, p. 65).

Rhythm: Rhythm means the repetition of movement on a regular basis, combining unity and change (Shawki, 1998, p. 224).

Rhythm works to add an atmosphere of dynamism and diversity to the design, as it is the repetition of certain units, shapes or degrees in the design in order to create a link between the units included in the design and the rhythm of several types:

- Monotonous rhythm: in which both the shape and the floor are proportional, and they are completely similar in terms of size, shape and place.
- not Monotonous rhythm : and they are similar in shape to each other without the shapes being similar to the floors.
- Free rhythm: in which the forms of the units differ with each other, with the difference in the form of communication.
- Contrasting rhythm: It is when the floor is stable with a contradiction in the size of the shapes, or vice versa.
- An increasing rhythm: in which the units are repeated in an increasing manner (2007, p. 47).

Unity: Achieving unity in the artwork with the basic requirements, and unity means in its simplest form the unification of all parts or their compatibility, solidarity and cohesion with the overall system of design, meaning that it tends to relate the part to

the part and the relationship of the part to the whole, and it is thus an integrated compatibility to perform the formative function and the expressiveness and aesthetics of the design as well as the artistic work acquires the aesthetic value in the unity that links the elements of the work together. (Ali, 2011, p. 66).

Unity goes beyond the collection of formal elements to include the unity of thought, the unity of form, and the unity of style in the unity in formation, so it cannot be called formation without unity (Shirzad, 1985, p. 53).

2-2 Previous studies

The researcher conducted a field survey in the field of specialization, and she did not find any study that used the strategy of spatial / visual intelligence and its effectiveness in the achievement of students of the Institute of Fine Arts in the subject of the foundations of design, which means that this study is a pioneer in this field.

3. Research methodology and procedures

3-1 Research Methodology: In the completion of the current research, the experimental research method was used, and the method of two-sample experimental and control subjects with visual tests and tight control was used.

3-2 Research Community: The research community was determined by male and female students of the 1st stage in the Institute of Fine Arts for boys and girls in Diyala Governorate, the morning study. The number of students for the first stage was (68) students distributed in (4) departments, while the number of female students was (75). Female students distributed in (5) departments, according to the statistics of the General Directorate of Education in Diyala Governorate for the year 2022.

3-3 research procedures

3-3-1 Research samples: Three types of samples were used in the current research: a sample for the exploratory study and two samples for the basic study, the first is an experimental sample and the second is a control sample, as follows:

3-3-1-1 The sample of the exploratory study: It consisted of (80) male and female students, with (40) male and (40) female students from the first stage. They were taken randomly, and this formula was used in building procedures (Table-1).

3-3-1-2 The experimental sample: It consisted of (20) male and female students (10 male and 10 female students) from the first stage students who were chosen randomly. The researcher used this sample to conduct the experiment on it after controlling all the variables (table-1)

Table 1

Gender, number, Total	Gender		Total
	Male	Female	
The survey sample	40	40	80
experimental sample	10	10	20
The control sample	10	10	20

3-3-1-3 The control sample: It consisted of (20) male and female students (10 male and 10 female students) from the first stage students, who were chosen randomly. The researcher used this sample as a control sample in the research (Table-1).

3-4 Exploratory Study

The researcher intended to conduct this study for the purpose of constructing the achievement test, as well as extracting the validity and reliability of this achievement test, according to the following steps:

- The researcher identified the foundations of design according to what is found in the textbook of the Institute of Fine Arts, and these foundations reached (6) foundations, as the researcher found that the authors neglected the seventh foundation, which is proportion), so the researcher relied on what is in the curriculum and to avoid any problems they may have.
- The researcher intended to formulate optional paragraphs with (5) paragraphs for each of the foundations, so the number of test items was (30) items.
- The test paragraphs were distributed as (10) paragraphs (multiple choice), (10) paragraphs filled in by the male or female student, and (10) paragraphs (true or false).
- One point is given for each correct answer, while (0) is given for each wrong answer.

3-4-1 Validity of the test: The test items were presented in a special form to a committee of experts whose number reached (5) experts in the fields of art education to extract the apparent validity of the test (Appendix -1-). The percentage of experts' agreement on the test items reached (100%) and (80%) as the researcher modified some of the paragraphs according to what the experts decided, and thus the test has become valid, which is called (virtual validity) and can be relied upon.

3-4-2 The stability of the test: What is known as (the stability of the test correction) was extracted for the test, as the researcher proceeded to apply the test to all members of the survey sample, whose number was (80) male and female students (40 male and 40 female students), and then corrected those forms. After that, she randomly took (20%) of these questionnaires, which totaled (16) questionnaires, and handed them over to two correctors, each separately, so that they would grade these forms.Then, the correlation coefficients were extracted between them and the first corrector, then between them and the second corrector, and then between the first corrector and the second, and all of these coefficients were of the same great significance, which affects the stability of the correction for this test (Table-2).

Table 2

Correlation coefficients and their indications	correlation coefficient	indication
between the researcher and herself after 14 days	0.928	The signifier is at 0.01
Between the researcher and the first corrector	0.904	The signifier is at 0.01
Between the researcher and the second corrector	0.896	The signifier is at 0.01
between the first researcher and the second	0.892	The signifier is at 0.01

3-5 Rewarding the experimental and control samples: After the researcher extracted the validity and reliability of the correction for the test, the researcher proceeded to reward the two samples of the basic study, the experimental sample and the control sample, each of which had a population of (20) male and female students, with (10) male and (10) male students.

And it adopted the procedure of subjecting the two samples to a pre-test on the subject of design foundations, and then proceeded to correct their answers according to the test items

of (30) items, by giving one degree for each correct answer and (zero) for each wrong answer, then subjected their degrees to statistical analysis using the (t) test shows that the calculated value of (t) amounted to (0.052), while the tabular value of (t) with a degree of freedom (38) was (1.687), and because the calculated (t) value appeared, each of the (t) values was greater, and this is not the case. The differences between the scores of the two samples in the pre-test are not significant at the level (0.05), which indicates that the two samples are equivalent in terms of design principles in the pre-test, and thus the first hypothesis was accepted (Table-3).

Table 3

The nature of the sample	Number	Average	standard deviation	Calculated value	tabular	The significance at the level of 0.05
The experimental sample	20	12.12	3.422	0.037	1.687	non-significant
The control sample	20	13.08	3.22			

6- The main study

The researcher proceeded to conduct the basic study after she was sure of the validity and stability of the correction of the research tool, as well as rewarding the samples of the study in the variable of previous experience (the foundations of design). She conducted her study according to the following:

The researcher taught the two samples herself, according to a schedule, on the same day, and for the same lecture.

The study lasted for a period of (8) weeks, at the rate of one lecture per week for both samples, as the researcher taught the experimental study sample on the time of the spatial (visual) intelligence strategy, while the control sample was taught by the lecture method, and the study extended from the date / / 2022 until / / / 2022.

The researcher proceeded to teach the experimental sample according to the mechanisms and steps of the spatial (visual) intelligence strategy, because she explains to them each of the foundations of the design and then asks them at the end of the lecture to draw that basis through their imagination and in abstract forms that they distribute in the space of the painting while they do not ask for that from the control sample, but it suffices to explain that basis.

At the end of the experiment, which was eight weeks, in which each of those (6) foundations was explained, as the first lecture was taken as an introduction to the subject, while the second lecture was the end of the two experiments typical answers for the test (the key to correction), so each male or female student has a score in the foundations of design out of (30), and these scores have been subjected to statistical analysis as scores used in calculating the research results according to the hypotheses that have been set for them.

3-7 Statistical means

The researcher used the following statistical methods:

3-7-1 Coeer's equation was used in calculating the apparent exchange rate for the test, and the equation was used:

$$Pa = \frac{Ag}{Ag+Dg} * 100$$

(Cooper, 1974, p39).

3-7-2 Correlation coefficient (Pearson) was used to calculate the stability of the test
r =

$$r = \frac{N\sum xy - \sum x \sum y}{\sqrt{[N\sum x^2 - (\sum x)^2][N\sum y^2 - (\sum y)^2}}$$

Al-Kinani, 2009, p. 78

3-7-3 (t) test This test was used in calculating the differences between the averages in rewarding the two main study samples (experimental and control) and in calculating the research results.

3-7-4 Equation (n) to denote the correlation coefficients (Pearson) and it was used to define the significant significance of the (Pearson) correlation coefficients when calculating the stability of the test.

$$t = \sqrt{\frac{N-2}{1-r^2}}$$

Ferkson, 1990, p. 241
t =

3-7-5 The standard deviation equation was used to calculate the standard deviations of the scores of the experimental sample and the control sample.

(Al-Sayyid, 1979, p. 156)

$$\sqrt{\frac{\sum(F*D)2}{N}} = \text{standard deviation}$$

3-7-6 The test (man and woman) was used to calculate the differences between males and females of the experimental class, and the following was used:

J = N1N2
n = n1n2
(Al-Sayyid, 1979, p. 489).

4- Research Results And Discussion

4-1 The first hypothesis was verified and accepted in the third chapter when the two samples of the basic, experimental and control study were rewarded (there were no significant differences in the achievement of the nature of the experimental sample, the achievement of students in the experimental sample, and the achievement of students in the control sample in the foundations of design in the pre-test in The level (0.05) showed that there were no differences, so the hypothesis was accepted.

4-2 The second hypothesis (there are no significant differences in the achievement of the students of the experimental sample and the achievement of the students of the control sample in the principles of design in the post-test at the level (0.05).

The statistical analysis of the research data (the basic study) resulted in the presence of significant differences in the achievement of the two samples of the basic, experimental and control study, and in favor of the experimental one. Therefore, this hypothesis was rejected, as it was found that the value of (n) calculated is greater than the value of (n) tabular, and this indicates the presence of Significant differences at the level (0.05) in the achievement of the two study samples (Table -4).

Table 4

number, average and standard deviations	Number	Average	Standard division	N value		The significance at 0.05
	20	21.642	4.292	Calculated	Tabular	
Control sample	20	15.384	3.844	4.744	2.093	Significant

4-1-3 The third hypothesis: There are no significant differences in the achievement of male and female students in the design principles in the post-test at level (0.05).

The statistical analysis of the study data showed that there were no significant differences at the level (0.05) in the achievement of male and female students in the design foundations subject in the post-test, so this hypothesis was accepted (Table-5)

2- Discussing the results of the research:

From the observation of (Table-4), we find that there is a significant difference at the level (0.05) between the experimental sample and the control sample in students' achievement on the basis of design. This was indicated by the fact that the calculated (n) value amounted to (4.744), which is higher than the tabular (n) value of (2.093). Which made them outperform the control sample in the post-test, for whom the researcher contented herself with using lectures only in their teaching of design foundations.

And if we reflect on (Table-5), we find that there is no significant difference in the level (0.05) between the male and female students of the experimental sample in their achievement in the foundations of design subject, which is evidenced by the fact that the value of the minimum (j) (25.5) is greater than the value of (J) Table (23), which indicates that there is no difference between male and female students of the experimental sample at the level (0.05) (Table-5).

Table 5

value and ranks	Number	The total ranks	E value			The significance at 0.05
Male students	10	142	Major	Minor	Tabular	
Female students	10	140.5	29.5	25.5	23	Non significant

4-3 Conclusions:

The researcher concluded the following:

4-3-1 The use of the multiple intelligence strategy (visual intelligence) makes the students of the Institutes of Fine Arts for boys and girls understand the foundations of design in an easier and more useful way than the lecture method.

4-3-2 The difference of sex has no effect on the effectiveness of using the strategy of visual intelligence in the achievement of the students of the Fine Arts Institutes for boys and girls.

4-4 Recommendations:

The researcher recommended the following:

4-4-1 Using the visual intelligence strategy in teaching other sample subjects.

4-4-2 Using the multiple intelligence strategy in teaching, regardless of the nature of gender, as it is suitable for both male and female students.

4-5 Hypotheses:

The researcher hypothesized to conduct the following study:

4-5-1 The effectiveness of using the strategy of visual intelligence in the achievement of the students of the Department of Art Education at the Faculty of Fine Arts in the subject of graphic composition.

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Appendix -1

Members of the expert committee

Mahmoud Hammadi returned / plastic education / retired.

Raad Aziz Abdullah / art education / retired.

Ali Abdul Karim Reda / Art Education / College of Education for Human Sciences / Karbala University.

Hamed Hussein Khudair / Fine Education / College of Fine Arts / University of Babylon.

Imad Khudair Abbas / Teaching Methods / College of Fine Arts / Art Education / University of Diyala.