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The Effect of the Jigsaw Cooperative Strategy and the Conventional Method on Handicraft Skills for Female Students at the Institute of Fine Arts

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ABSTRACT: The research strives to:

Assess the effects of the Jigsaw cooperative learning strategy on the manual skills of third-year students at the Institute of Fine Arts. To achieve this objective, the researcher formulated the null hypothesis:

At the 0.05 significance level, no statistically significant difference was observed between the post-test mean scores of students instructed using the Jigsaw cooperative strategy and those taught by the traditional method in manual skills assessment.

The experimental approach consisted of a two-group (experimental and control) post-test design. The research sample included 20 students from the Institute of Fine Arts. The researcher created six lesson plans that were taught by the researcher. The post-test was administered to both groups. Various statistical tools were applied in the study, including the T-test and Pearson correlation coefficient.

The most important findings of the research are:

The experimental group who was taught using the Jigsaw cooperative strategy outperformed the control group taught by the conventional method. This indicates that the teaching strategy positively influenced the students' manual skills outcomes.

Keywords: jigsaw cooperative study, cooperative learning, handicraft skills, traditional teaching methods.

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1. Introduction

First: Research Problem

Educational curricula were formerly designed for a stable, gradually evolving world. Our society currently exists in a swiftly evolving environment characterized by both local and global challenges, notably the proliferation of knowledge, technological advancement, and increased global interconnectedness facilitated by rapid communication and transportation, rendering the world akin to a small city. This necessitates the cultivation of reflective minds capable of transformation, which is the current responsibility of education. Researchers and scholars have emphasized the need to diversify the use of methods and strategies that suit students' abilities and levels, and to select types of tasks appropriate to the teaching method—methods that develop and encourage learners to think, infer, and hypothesize to discover facts and achieve better learning. One of the solutions is to apply teaching strategies, models, and theories, including the Jigsaw cooperative strategy.

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Al-Sayeh (2001) defines cooperative learning as "a pedagogical model wherein students collaboratively apply acquired skills, exchanging insights, dialogue, and information pertinent to those skills." They assist one another in the learning process, and through this engagement and effective interaction, they cultivate positive personal and social competencies." (Al-Sayeh, 2001, p. 117).

The researcher conducted a survey by posing specific questions to a sample of female students that attend the Institute of Fine Arts, Department of Plastic Arts, to inquire about two matters. The first was the current teaching methods and their types; (10) out of (10) respondents indicated that the prevailing teaching method is the traditional lecture. The second matter concerned the extent of benefit the students gain from this type of teaching. The survey sample clarified that they need greater effort to understand the study material and practical manual skills.

Through her extensive experience in the educational field, the researcher observed that the curricula do not meet the needs required to develop the intellectual and skill capacities of the students. This can cause boredom for learners with high or even average intellectual ability, as well as lead to weak cognitive and creative development. Therefore, it is necessary to focus on and utilize non-traditional programs and teaching methods to benefit the students.

Thus, the research problem centers on answering the following questions:

To identify the impact of the Jigsaw cooperative strategy and the approach used on manual skills and cognitive achievement in the art education lesson for third-year students at the Institute of Fine Arts.

Accordingly, the researcher decided to study which is better: the Jigsaw cooperative strategy or the conventional teaching methods followed in manual skills and cognitive achievement in the manual arts lesson for third-year students at the Institute of Fine Arts.

Second: The Importance of the Research

Performance variability can be attributed to individual differences that can be addressed through the appropriate teaching method employed by the teacher or school during practical lessons. The use of suitable teaching methods depends on the interactive relationships between the teacher, the student, and the learning objectives. This will reflect specific teaching behaviors and particular learning behaviors. Each method has its own goals and applications and must align with the learner's level, educational stage, age, and suitability for the required effectiveness or skill.

The research's importance is shown in these points:

1. Several factors have converged, most notably the demand for better positive outcomes in the technical and skill-based learning process and making its results compatible with the requirements sought by society due to the increasing number of students. The modern scientific trend opposes traditional methods used in education on one hand, and the progress achieved in the study of various sciences on the other. This has led to the consideration of developing strategies, methods, and teaching approaches that align with scientific developments and modern technologies. This motivation has driven the researcher to develop a method that contributes to enhancing the abilities of female students in the Department of Fine Arts (Handicrafts) to fulfill the requirements of the handicrafts course prescribed for this stage.
2. The use of the Jigsaw strategy in education in general, and in various arts disciplines in particular, contributes to presenting the requirements of handicraft tasks to the students and recording their responses through its application. It also allows for diversifying the experiences offered to them to align with their needs, requirements, and readiness. Additionally, it enables the utilization of multiple educational tools through the presentation of various educational technologies (Multi-Media).

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3. Designing an educational program assisted by the Jigsaw strategy allows for student participation in learning, which helps maintain their continuous inclination toward learning. It considers their abilities and readiness, stimulates and attracts the student's attention throughout the learning period, increases their motivation, and facilitates their comprehension of basic artistic tasks and designs. It also helps them acquire artistic skills that assist in fulfilling the requirements of handicraft work.
4. Given the student's intellectual abilities and positive creative attitudes, she can accept the creative process through engaging in educational teaching activities. The student's ability to understand the requirements of the arts subject correctly and to apply them through mental practice, which carries an aesthetic quality added to the form of artistic performance, is crucial. This ability, combined with the student's possession and mastery of the skills of this subject, leads to the creative aspect, which is a requirement of artistic work.
5. The results of the research may benefit the educational institutions related to artistic work and their application in fulfilling the requirements of handicraft tasks. Notably, the researcher used the Jigsaw educational model in teaching this subject, which is a modern scientific learning method that attracts the student's attention and incorporates accuracy, speed, and the provision of feedback.

Third: Research Objective

The research seeks to determinate the effectiveness of the Jigsaw strategy in developing the skills of female students in handicrafts at the Institute of Fine Arts for Girls – Baghdad, Al-Karkh First.

To verify the research objective, the following two hypotheses were formulated:

a) The Jigsaw strategy in the pre-test shows no statistically significant differences between the mean scores of students exposed to the training program and those not exposed at the 0.05 significance level.

b) The Jigsaw strategy in the post-test shows no statistically significant differences between the mean scores of students exposed to the training program and those not exposed at the 0.05 significance level.

Fourth: Research Boundaries

- Human domain: Female students of the Institute of Fine Arts in Education – Baghdad, Al-Karkh First.
- Temporal domain: Academic year 2022 – 2023.
- Spatial domain: Handicrafts Hall – Institute of Fine Arts.

Fifth: Definition of Terms

- Effectiveness:

The amount of change caused by the teaching content according to the Jigsaw strategy among female students at the Institute of Fine Arts for Girls.

- Strategy:

A set of specific procedures carried out by the educator to make the learning process faster, easier, more enjoyable, and more self-directed, as well as adaptable to new situations. (Abourash, 2007, p. 206)

- Handicrafts:

The effective and impactful use of information with high technical skill to accomplish or develop a specific work in the arts, involving speed, ease, flexibility, and precision in performing a manual task (Mousa, 2000, pp. 59-60).

Joudi defined it as "the education of individuals through the development of their artistic manual skills and

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the enhancement of their innovative activity practiced at home and school" (Joudi, 1981, p. 65).

- Jigsaw Strategy:

One of the active and effective cooperative learning strategies that contributes to supporting learning as one of the contemporary educational and psychological approaches with significant positive impact on the learning process. It shifts the teacher's role from a passive transmitter of information and knowledge to a facilitator and guide in student learning, as students work in small groups on curriculum tasks (Al-Ayasrah, 1998, p. 65).

2. Theoretical Overview of the Main Concepts

First: Cooperative Jigsaw Strategy

Despite the benefits of cooperative learning, educators and psychologists in Austin, Texas, devised an improved approach known as the Jigsaw method, which mirrors the configuration of a jigsaw puzzle. The objective was to enhance relationships among students of English, Hispanic, and African American backgrounds to mitigate racial tensions (Al-Qasirin, 1998, p. 67). The application of this method demonstrated that English-speaking students excelled in Jigsaw classrooms. At the conclusion of the study, camaraderie and benevolence among group members and other students in the class were significantly enhanced compared to the period prior to the study's initiation. This method produced favorable outcomes in academic performance, attitudes, and behavioral activities; fostered student collaboration and teamwork; and dismantled personal barriers among students (Al-Hilah, 2005, p. 95).

Maximizing outcomes—such as academic achievement, positive attitudes toward learning, and critical thinking skills—offers benefits that extend beyond their inherent value. Although these outcomes are valuable, knowledge and skills are of little use if the learner cannot apply them in cooperative interaction with others. The ability to perform technical skills such as reading, speaking, listening, writing, arithmetic, art education, and problem-solving is beneficial; however, these skills are of limited value if the individual cannot apply them within cooperative interactions with others. It is not effective to train a teacher, engineer, or secretary if the person lacks the collaborative skills necessary to apply knowledge and technical skills in cooperative work relationships. Students who learn cooperatively are more capable of acquiring this strategy, transferring its impact, and applying it in their academic and practical lives. Consequently, they become role models for their future students whom they will teach (Al-Hilah: 2000, p. 87).

The Jigsaw strategy is one of the active and effective cooperative learning strategies that support learning as one of the contemporary educational and psychological approaches with significant positive effects on the teaching process. It facilitates the transition from the teacher's role as a passive transmitter of information and knowledge to a guide and facilitator in student learning. Students work in groups with different tasks assigned to each member, aiming to enhance the student's performance in the educational process and transform them into an active, participatory, and cooperative member rather than merely a listener and recipient of information..

Jigsaw Strategy relies on dividing female students into small groups consisting of 4 to 6 students each. Each group is called the "home group" (المجموعة الأم) and is heterogeneous. Each member is assigned to study a specific part of the lesson to become an expert in it. Then, these expert students from different home groups who studied the same part meet in new groups called "expert groups" (مجموعة الخبرة) to study and discuss the best method to teach this part to the rest of their home group members. Each member of the expert group is then responsible for teaching their home group the part they have become an expert in. Finally, all students individually take an assessment that covers the topic comprehensively, as previously explained.

Second: Handicrafts

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Handicrafts are an applied art that involves working skillfully with the hands using various materials. These crafts require manual processing and depend on the coordination between hand and eye. The work of the artisan elevates the value of the primitive tools used and does not emphasize the importance of machines. Handicrafts express the human spirit through shaping materials, which greatly stimulates the mind. Handicrafts are characterized by diversity in their materials, allowing the learner to compose and innovate new forms such as innovations in paper, textiles, wood, clay, and others. Through this practice, the individual engages in creative thinking and develops an aesthetic standard for tangible objects.

Al-Hajjaj defined handicrafts as "a practical educational means that trains learners to innovate and is characterized by the diversity and variety of its materials and subjects, which help form a general attitude toward understanding the values of things from an emotional perspective" (Al-Hajjaj, 1956, p. 78).

Joudi defined it as "the education of individuals through the development of their artistic manual skills and the enhancement of their innovative activity practiced at home and school" (Joudi, 1981, p. 65). Handicrafts are considered the oldest form of expressive production; thus, they represent a human activity deeply rooted in human nature since ancient times. Its origin dates back to the early creation of artistic models used by humans to control natural resources.

Handicrafts represent a fundamental element in art education, wherein individuals acquire specific skills, experiences, and knowledge through the utilization of diverse materials. Moreover, their abilities and sensory sensitivity develop as a result of their interaction, contemplation, and appreciation of diverse materials.

Handicrafts provide individuals with the opportunity to engage with materials by understanding their nature, challenges, and sources.

It is essential to utilize environmental materials such as paper, metal, glass waste, and types of plastic to create three-dimensional sculptural models that incorporate aesthetic and expressive elements.

Handicrafts work to develop the individual's innovative capacity, enriched by the vast variety of materials available. Each material may have specific properties and characteristics that allow students to explore and experiment. They also grant individuals the ability to think, reflect, and attempt to create innovations by employing different materials such as paper, cork, glass, and tree branches.

Handicrafts have the advantage that when an individual is confronted with raw materials and tools, it helps them develop a general orientation toward appreciating the value of things. This leads to forming a deep vision that perceives relationships, compositions, and aesthetics that the ordinary eye would not see. Additionally, it aids the student in developing insight toward objects and helps them in their future life to form a sense of general taste.

3. Methodology

This chapter describes the steps taken in the research, including choosing the right experimental design, the research community, the sampling method, ways to make the two groups equal, a list of the research needs and tools, how they were used, and the statistical methods used to analyze the results. The following is a detailed account of the aforementioned procedures:

Research Method:

The researcher relied on the experimental method due to its suitability for the research objectives. This method is distinguished by its superiority over other methods in the degree of confidence it provides in

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interpreting relationships between variables, especially causal relationships that are difficult to study without experimentation.

Experimental Design: Choosing the suitable experimental design ensures the researcher can effectively address challenges encountered during statistical analysis. The outcomes of experimental research are contingent upon the specific experimental design employed. The suitable experimental design is based on the research objectives, its variables, and the conditions under which the design will be implemented (Awda, Ahmed Salman, 1998, p. 250).

The researcher utilizes a quasi-experimental design with post-testing structured for two equivalent groups. One of these is the experimental group, while the other is the control group (Dawood, Aziz Hanna, 1990, p. 227).

Two groups are treated identically, but with different interventions to make a judgment about the effect of these different interventions on the dependent variable. This type of design follows the procedures of research with an experimental group using Jigsaw strategy training and a control group using the traditional method. Figure (1) illustrates this.

Group	Pre-test	Independent Variable	Post-test	Dependent Variable
Experimental	Skill Performance	Jigsaw Strategy	Skill Performance	Difference in Skill Performance
Control		Conventional Method		

Figure (1) The Experimental Design Used in the Research

The post-test measures the dependent variable of the test, which is the skill performance, to determine the effectiveness of skill performance using the Jigsaw strategy and the traditional method, and to compare between them (Mohammed, 1988: 129).

Research Population:

The research population refers to the entire set of elements that the researcher wishes to generalize the findings (those associated with the problem) to. The research population includes female students, from the Institute of Fine Arts for Girls, Karkh First (Evening Study), Fine Arts Department, third stage, for the academic year (2022–2023). Table (1) illustrates this.

Table (1) No. of Female Students at the Institute of Fine Arts and Their Departments

No.	**Academic Departments**	**Number of Students**
1	Music Department	**75**
2	Fine Arts Department	**102**
3	Calligraphy and Ornamentation Department	**68**
4	Design Department	**67**
5	Audiovisual Department	**53**
Total		**365**

Research Sample:

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The sample was chosen from the population following scientific protocols, guaranteeing that it accurately reflects the population. The researcher selected a purposive sample from the original population at the Institute of Fine Arts / Al-Karkh First for Girls (evening study), Department of Plastic Arts, comprising 20 students, with 10 students from Section A constituting the experimental group and 10 students from Section B forming the control group for the academic year (2022-2023). Table 2 illustrates this.

Table (2) No. of Female Students in the Study Sample

Group	**Section**	**Total**
Experimental	A	**10**
Control	B	**10**
Total	20	

Research Variables:
The research variables identified as follows:
1- Independent Variable: Instructional plans designed according to the Jigsaw strategy.
2- Dependent Variable: The observed variable in the skill performance test measured for the students of both groups (experimental and control).

Equivalence of the Research Groups:
(1) Chronological Age: This variable was controlled due to its relevance to cognitive development and the technical and skill maturity possessed by individuals in the current research sample. The ages of the selected students in the current research sample were calculated in years for both the control and experimental groups. After testing the differences between the two groups in this variable using the Mann-Whitney U test by extracting the rank coefficient (R) and the calculated (U) value and comparing it to the calculated value of (23), it was found that there are two calculated (U) values: one small (57) and one large (73). Therefore, the null hypothesis, which states that there are no statistically significant differences at the 0.05 level between the control and experimental groups in the age variable, is accepted. This result indicates that the two groups are statistically equivalent.

(2) Skill Performance Test (Pre-Test):
The researcher decided to control the skill test variable to assess the level of skill performance among the students in the research sample regarding their possession of these skills and to determine their needs for the components of the instructional plans. Accordingly, they were subjected to a pre-test of skill performance. In the subject of Handicrafts, the researcher conducted a pre-skill test on (7/10/2022). To verify the pre-skill performance, the researcher used the Mann-Whitney test to extract the rank correlation coefficient (R) and the calculated value (U) regarding the skill performance of the experimental and control groups' students. This was done to identify the significant differences between them related to their prior experience in possessing the skills required by the topics of this subject before applying the independent variable (teaching plans). Table (3) illustrates this.

Table (3) Pre-Skill Rank Correlation (R) and Calculated Values (U)

Group	**Sample**	**Rank Coefficient (R)**	**Calculated Value (U)**		**Table Value (U)**	**Significance (0.05)**
			Large	Small		
Experimental	10	126	70	29	23	**Not significant**
Control	10	85				

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In Table (3), it is clear that there are two values calculated for (U), a small value of (29), and a large value of (70). Since the calculated value of (U) is (23) at the significance level of (0.05), which is lower than the small calculated value of (U), we accept the null hypothesis, which states there is no statistically significant difference between individuals in the sample of the two groups in possessing the skills that the handicrafts subject requires. Therefore, we conclude that the two groups were equal in parts of the pre-performance skills test.

(3) Intelligence Test:

Intelligence tests are among the most prominent psychological tests and are widely used as effective measurement and evaluation tools, with their results playing an important and primary role in many fields.

On Sunday, October 7, 2022, the researcher administered to the sample participants in both the control and experimental groups, Raven's Progressive Matrices test, to verify the answers from the female students in both groups on the items on the intelligence test. Therefore, the researcher utilized the Mann-Whitney test to extract the rank correlation coefficient (R) and to determine and calculate (U) on the intelligence test of the experimental and control groups' students, and to examine the significant differences between the two groups (students) regarding cognitive abilities.

It is evident that there are two calculated values of (U), one being small (24) and another value being large, (46). Given that the calculated value of (U) is equal to (23) at a significance level of (0.05), which is smaller than the smaller calculated value of (U), the null hypothesis is accepted. This hypothesis refers to statistical inference. The null hypothesis states there is no statistically significant difference between individuals in the sample of the two groups in possessing cognitive abilities, and the researcher concludes there are no statistically significant differences in this variable, indicating that the two groups are equivalents in the intelligence-variable.

Controlling Extraneous Variables: The procedure of regulating specific variables in experimental studies, especially within educational and psychological research, seeks to eradicate the impact of any variable aside from the independent variable. The dependent variable is influenced by numerous factors beyond the experimental variable, necessitating the isolation and exclusion of other variables that may affect behavior from the experiment (Owais, 1997, p. 107).

In addition to the previously mentioned procedures of statistical equivalence between the female students in the two research groups regarding variables that affect the dependent variable, the researcher made every effort to avoid the confounding effects of some influencing factors on the integrity of the experimental design. The following clarifies how these factors were controlled:

Experimental Conditions and Accompanying Events:

Accompanying events refer to natural incidents that may occur during the experiment, such as disasters, floods, earthquakes, hurricanes, wars, job transfers, and others that could disrupt the course of the experiment. The researcher endeavored to avoid these events as much as possible by compensating for days missed due to interruptions.

Attrition:

This refers to some students leaving the research sample and being absent for an extended period, which might cause differences in research results. This factor did not have a strong impact on the experiment, and some of these absences were compensated for on other days.

Difference in Sample Selection:

The researcher attempted to mitigate the influence of this variable on the experiment's outcomes by randomly selecting the sample, distributing it among groups, and randomly assigning the method to those

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groups. The researcher aimed to establish statistical equivalence among participants in the two research groups concerning specific variables that could interact with the independent variable and influence the dependent variable. Moreover, there was significant uniformity among the students in both the experimental and control groups regarding social, cultural, and economic factors, as they originated from the same social milieu.

The effect of this is evident in the bias that the researcher might introduce, which can also result from individual differences in selecting a high-performing comparison group. However, this experiment did not exhibit any form of bias, and the procedures were conducted with full integrity.

Measurement Tool:

The researcher used a skill performance test and measured it through a performance evaluation form in the subject of (Handicrafts) for both the experimental and control groups.

The Effect of Experimental Procedures:

Teacher: Regarding the possibility of this factor's interference in the experiment's results, the researcher taught the students in both the experimental and control research groups. This adds a degree of accuracy and objectivity to the research results.

a) Lecture Distribution: The subject of (Handicrafts) was allocated one class session per week. The researcher, in cooperation with the institute's administration, ensured an equal distribution of lessons between the research groups to meet the requirements for the experiment's success. The (Handicrafts) sessions were scheduled on (Sunday and Tuesday). The weekly lesson schedule was organized in collaboration with the institute's administration based on this arrangement, noting that each session lasted (60) minutes. Table (4) illustrates this:

Table (4) Class Schedule for the Experimental and Control Group

Institute	Group	Day	Class	Hour	Teaching Method
Institute of Fine Arts	Experimental	Sunday	First	05:00	**Jigsaw Strategy**
	Control	Tuesday	First	05:00	**Traditional Method**

(b) Educational Techniques: The researcher used the same educational techniques when teaching both research groups, including the blackboard, chalk (white and colored), data show (projector), computer, documentary films, charts, and educational visuals.

(c) The establishment of the Institute of Fine Arts for Boys in Karkh: The experiment took place in the hall of the Department of Plastic Arts within the institute, which had been equipped with all necessary requirements and conditions to accomplish implementing the experiment successfully.

(d) Duration of the Experiment: The duration of the experiment was the same for both the experimental and control groups and commenced on Sunday, October 7, 2022, and ended on Tuesday, December 25, 2022.

Identification of Needs and Prerequisites:

For the purpose of determining the needs and prerequisites of the female students related to mastering the skills of (handicrafts) prescribed for the students of the Department of Plastic Arts, in order to assess the extent of their benefit from these skills and their application in completing the requirements of the artistic work. Additionally, to identify the difficulties and problems they face in mastering and performing the skills, which are part of the requirements of this subject, and which they perceive as obstacles preventing the achievement of its objectives. Their suggestions that may contribute to the development and enhancement of their artistic skills in completing their work were also collected.

Based on the foregoing, an exploratory study was conducted on a sample consisting of five female fourth-

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grade students from the Institute of Fine Arts for Education in Baghdad – Evening Karkh Branch, Department of Plastic Arts. These students were selected from those excluded from the main sample who had previously studied the subject. The purpose was to verify their needs regarding the study of the subject and to achieve its educational objectives, as well as to assess their needs for activities, events, or assessments that they believe might stimulate their motivation to learn and enhance their artistic maturity. The exploratory questions posed were as follows:
Q1: What difficulties did you encounter in studying the prescribed subject of (Handicrafts)?
Q2: What are your suggestions for developing the subject?

This exploratory study was beneficial in identifying the obstacles to mastering the subject of (Handicrafts) and the students' proposals for developing its educational content. These findings were employed in constructing the teaching plans, where the educational and behavioral activities and the educational content for each teaching plan were determined. The study also contributed to identifying methods and approaches that can be followed to organize and sequence the information within the educational content of the plan. Thus, the results of this exploratory study defined the needs and requirements that must be fulfilled for the students, specifying what should be provided to them and highlighting the dimensions of topics that are unnecessary and do not meet their needs in this subject.
Moreover, this study provided the researcher with an indicator regarding the accumulation that should exist in the students' memory related to artistic skills, tools, and materials used for those artistic skills required to represent the components of the artwork. This is essential to recall and assist them in performing and mastering these skills as prerequisite requirements for employing them in completing the artwork.

Constructing the Skill Performance Test and the Skill Performance Evaluation Form:
The skill performance test is the true measure that assesses the skills students have practiced during a specific instructional period. It is designed to implement a set of clearly defined (skill-based) objectives, as the behavior described in the objectives is measured directly. Performance (practical) tests aim to evaluate the student's work and measure the degree of accuracy and proficiency achieved in the performance.

Since the current research aims to measure the skill aspect in the subject of (Handicrafts), the study required identifying the objectives in their initial form, which consisted of six general tasks. The researcher presented these to ten experts and specialists in handicrafts, teaching methods, fine arts, and assessment and evaluation (Appendix 1) and requested them to assess the validity of these general objectives for handicrafts in light of their observations and opinions. Some of the objectives were rephrased based on their feedback. All objectives received approval from 80% or more of the experts. The researcher adopted this percentage as the criterion for the validity of the educational objectives. These objectives in their final form are:

1. How do you apply the Jigsaw strategy in a handicraft that represents various aspects of life?
2. Execute a handicraft using local materials.
3. Employ Arabic calligraphy to highlight an idea made from fabric.
4. Develop an idea for a commercial product and then explain the method of its implementation.
5. How do you utilize the method of carpet making in a future exhibition?
6. How do you employ plastic handicraft work in a contemporary product using local materials?

The practical performance of a skill may surpass its theoretical or cognitive aspect, because the ultimate goal of the cognitive dimension of the skill is the mastery of practical performance. Referring to Bloom's taxonomy of behavioral objectives, which is one of the most widely used classifications, we find that the skill dimension is psychomotor—meaning it is both cognitive and performance-based simultaneously

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(Bloom, 1971, p. 80).

In light of the educational content for each skill and its behavioral objectives, the researcher identified the sub-skills (procedural performances) for each of the six main skills in a cumulative and interconnected manner that leads to mastery of the primary skill. Accordingly, if a student does not master any part or parts of the (handicraft) skill, the skill loses its overall form or precision.

Based on the above, the researcher defined the procedures (sub-skills) for each main skill, noting that each sub-skill builds upon the previous one, collectively forming a greater holistic understanding until the main (comprehensive) skill is accomplished, perceived as an integrated system with its unique characteristics (Appendix 2).

The (handicraft) skills varied in their interconnected practical skills according to the requirements for accomplishing or performing each skill. From her field experience, the researcher observed that students—especially new learners—cannot perform every sub-skill with the same degree of accuracy or proficiency. Moreover, there is variation among students in the level of mastery or performance of each skill, whether sub-skills or main skills. Therefore, the researcher established a five-level scale for evaluating the performance of each sub-skill: Excellent, Very Good, Good, Average, and Acceptable, assigning the scores (5, 4, 3, 2, 1) respectively.

To verify the validity and reliability of the Practical Performance Assessment Form for skills, the researcher undertook the following procedures:

- Validity of the Skill Performance Form: After completing the components of the Skill Performance Assessment Form for the subject of (Handicrafts), the highest score a student could achieve was set at 50 points, while the lowest score was 10 points, as shown in Appendix (2). The initial version of the form was presented to a group of experts and specialists in handicrafts, teaching methods, fine arts, and measurement and evaluation (Appendix 1) to assess the suitability of its components in achieving the intended aims.

Based on the observations and feedback from the experts, some components were added and modified in the form. It was then resubmitted to the evaluators and achieved full validity (100%). Consequently, it became ready for use in measuring the skill performance of students when completing practical artistic skill tasks.

For the purpose of using this form to evaluate student performance, teachers specialized in handicrafts were trained in its application. They were provided with a copy of the form and instructed on how to assign grades to each student, as illustrated in Table (5).

Table (5) The process of designing the form and determining the criteria for measuring skills

No.	**Items**	**Skill Performance**				
		Excellent (5)	Very good (4)	Good (3)	Fair (2)	**Acceptable (1)**
1						
2						

Reliability of the Skill Performance Assessment Form:

As for the reliability of the skill performance assessment form, the correction reliability coefficient was determined between it and other observers (*). The researcher conducted this process by evaluating samples of the manual work required by the skill test, completed by the students (the research sample), which is part of the research requirements. The reliability coefficient for each work sample was calculated using Cooper's equation by extracting the scorer agreement coefficient. Table (6) illustrates this

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Table (6) Reliability Coefficient of the Skill Performance Assessment Form

Researcher	**Total Score**	
Observed	Researcher	Average
0.84	0.86	0.85
0.87	0.85	0.86
0.87	0.87	0.87
Overall Agreement Average	**0.86**	

(*) Dr. Suad Asad, Fine Art, Safaa Hassan, Lecturer, Faculty of Applied Art

By examining the results in Table (6), we observe that the overall inter-rater agreement rate is (0.86). This percentage provides a good indicator for ensuring reliability in scoring consistency according to the components of the skill performance form for the technical aspect in (handicrafts). Here, we refer to Cooper's confirmation regarding this matter, stating that reliability coefficients below (0.70) are considered weak, whereas a rate of (0.85) or higher, achieved through scorers' agreement, is considered a good indicator.

To complete the requirements for designing instructional plans, it was necessary to take an important step represented by designing a skill performance test and an assessment form aimed at measuring the performance skills acquired by the student, which can be measured using the performance evaluation form prepared by the researcher according to the skill aspect requirements (Appendix 3).

The process of designing the skill test and the skill performance evaluation form is considered an essential procedure in instructional plan design because it contributes to examining the mechanisms of the curriculum content and identifying the extent to which the students (target group) have acquired the required skill experiences of the subject. For example, the pre-test provides an indicator of the student's possession of technical information and skills before organizing the educational content and its components, including skill and behavioral objectives. Moreover, it contributes to identifying the internal and external validity of the instructional plans as well as recognizing the equivalence of the (research sample) in the educational experiences required by the subject.

Application of the Skill Performance Test:

1. The students of the two groups (experimental and control) took the skill performance test on Sunday, October 9, 2022. The researcher explained to the pre-application of the skill performance test prior to starting the actual teaching for students of both the experimental and control groups, which included directing them on how to handle the skills of the handicraft art hand skill according to each group (see appendix).
2. The researcher personally taught the experimental group and control group according to each of the prepared teaching plans, using the Jigsaw strategy for teaching the experimental group students, and the conventional method for the control group students.
3. Measurement Tool: The researcher used a standardized measurement tool for both groups, which was the skill performance test prepared by the researcher and administered on December 18, 2022, at 5:00 PM for both groups.
4. Educational Techniques: The educational techniques were similar for both the experimental and control research samples.
5. Teaching Location: The researcher conducted the teaching for both groups in the workshop of the Department of Plastic Arts, affiliated with the Al-Karkh Institute of Fine Arts.

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Statistical Methods: Various statistical procedures were utilized to analyze and interpret the data and information collected from the research sample and present the resulting findings:

1. Mann-Whitney U-test for two independent samples: This test was utilized to check the equivalence of the variables of chronological age, intelligence test, and skill test (pre- and post-).
2. Cooper's Equation: To calculate the percentage of agreement between the raters.
3. Kuder-Richardson Formula 20: In order to get the reliability coefficient of the cognitive achievement test.

4. Results

Research Findings In this chapter, the researcher provides the findings after applying the Jigsaw strategy to the experimental group of female students (10). After applying the skill performance scale, the results were as follows:

Null Hypothesis (1):

At the 0.05 significance level, there is no statistically significant difference in pre-test practical skill assessment scores between students learning handicrafts through the Jigsaw strategy and those using conventional methods.

The first null hypothesis was confirmed through the research procedures described in Chapter Three (Research Methodology and Procedures).

Null Hypothesis (2):

At the (0.05) significance level, no statistically significant difference was found between the post-test practical skill scores of students taught handicrafts with the Jigsaw strategy and those taught by conventional methods.

To verify the post-skill performance, the researcher used the Mann-Whitney test to extract the rank coefficient (R) and the calculated value (U) regarding the skill performance of the experimental and control group students in the handicrafts subject. This was to identify the significant differences between them related to comparing the effectiveness of the teaching plans prepared in this study (the Jigsaw strategy) with the conventional method used in teaching the handicrafts subject. Table (7) illustrates this.

Table (7) Post-Skill Rank Correlation (R) and Calculated Values (U)

Group	Sample	Rank Coefficient (R)	Calculated Value (U)		Table Value (U)	Significance (0.05)
			Large	Small		
Experimental	10	149.5	99.5	6	23	Significant
Control	10	55.5				

It is evident from Table (7) that there are two calculated values for (U), one small value of (6) and a larger value of (99.5). Since the tabulated value of (U) at the (0.05) significance level is (23), which exceeds the calculated value of (U), the null hypothesis is rejected in favor of the alternative hypothesis. The alternative hypothesis indicates that there is a statistically significant non-difference in favor of the experimental group regarding their skill performance and possession of the skills needed for the (Handicrafts) subject in the post-skill test.

The tabulated value of (U) = (23) at a significance level of (0.05), which is more than the calculated value of

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(U), the null hypothesis is rejected, and the alternative hypothesis is accepted. The alternative hypothesis indicates that there is a statistically significant non-difference in favor of the experimental group regarding their skill performance and possession of the skills needed for the (Handicrafts) subject in the post-skill test.

This is because the sum of ranks (R) for the experimental group's scores equals (149.5), which is greater than the sum of ranks (R) for the control group's scores, which equals (55.5). This indicates that the teaching plans in the current study were effective in assisting the experimental group students in mastering the technical skills related to the Handicrafts subject. The reason for this is attributed to the images and diagrams that aided the development of the students' skills related to the vocabulary of this subject and improved their practical skill performance.

5. Conclusions

1. Based on the results achieved from using the Jigsaw cooperative strategy in this study, the researcher reached the following conclusions:
2. The researcher achieved the desired competition, as evidenced by the students' commitment to lesson time, their attendance, eagerness to complete all steps themselves within the allotted time, and their completion of homework and suggestions without being asked.
3. The use of cognitive methods, particularly the Jigsaw cooperative strategy, which proved effective by aligning the educational content in instructional steps progressing from easy to difficult, supported by positive models and examples during the lesson, helped the students develop a cooperative approach through directing their artistic expression and enhancing their skills according to their needs.
4. The nature of innovative handicrafts and their popularity in the local market, which were learned and mastered in this study, increased the students' motivation to perfect their skills, as they realized the cost-effectiveness that may involve them in the future labor market and comprehensive development.
5. The researcher practically found that one of the most significant difficulties in developing skills in this way is the limited lesson time, and the process of acquiring multiple skills within a short period requires a training program with longer duration and time frame.

6. Recommendations

1. Adopt the Jigsaw cooperative strategy as a teaching method for the handicrafts subject in institutes of fine arts, as it raises academic levels and develops many specific skills for female student.
2. Provide school facilities suitable for implementing the Jigsaw cooperative strategy, including classrooms arranged as training workshops with all necessary requirements (tables, chairs, materials, and tools for handicrafts).
3. Promote cooperation between schools and the Handicrafts Center in the General Directorate of Education in Baghdad - Al-Karkh by organizing special handicraft exhibitions, similar to art exhibitions, on a semi-annual basis.
4. Develop training kits for the handicrafts subject using the Jigsaw cooperative strategy, especially in girls' schools, within the 20% of the curriculum left for teacher discretion, as these are essential and urgent needs for girls to learn needlework, sewing, doll making, modeling, coordination, design, and decoration.

7. Suggestions

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Based on the Results, the Researcher Proposes:

1. Conducting a comparative study between female and male students on the effect of the Jigsaw strategy in shaping handicrafts.
2. Evaluating the competence of handicraft teachers (male and female) through cognitive and constructive teaching methods in a manner that aligns with technological advancements.

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Appendix (1)

Names of the reviewers consulted by the researcher according to their academic titles and the nature of the consultation

No.	Evaluator's Name	Specialization	Workplace	Nature of Consultation	
				1	2
1	Prof. Dr. Saleh Ahmed Al-Fahdawi	Art Education	University of Baghdad, College of Fine Arts	/	/
2	Prof. Dr. Muneer Fakhri Al-Hadithi	Art Education	Institute of Applied Arts	/	/
3	Prof. Dr. Salma Khalil Ismail	Educational Psychology	College of Basic Education	/	/
4	Prof. Dr. Majid Nafi' Al-Kanani	Art Education	University of Baghdad, College of Fine Arts		/
5	Haitham Shaubi Ibrahim	Art Education	College of Basic Education	/	/
6	Prof. Dr. Adnan Ghaib Rashid	Measurement and Evaluation	Arab Higher Institute	/	
7	Assist. Prof. Dr. Hussein Al-Saqi	Art Education	College of Basic Education	/	
8	Assist. Prof. Rajaa Hamid	Art Education	College of Basic Education		/

1) Validity of the Skill Test.
2) Validity of the Study Plans.

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Appendix (2)

Educational Unit

Planning for Practical (Skill) Teaching

Lesson Name: Wool Lamp Covers (Tabilam)

Lesson Duration: 45 minutes Teacher's Name: Layla Shweily

Learning Objectives (Performance-Based)	Teaching Method	Trainer Effectiveness	Educational Techniques	Time (minutes)	Feedback (F.B)
By the end of the lesson, the student will be able to: - Wrap wool threads like a spider web around the ball. - Master evenly covering the surface of the rubber ball with glue. - Blend multiple contrasting or harmonious colors. - Conceal flaws in leftover wool threads and achieve the desired arrangement.	Presentation and Dialogue Presentation and Discussion Presentation and Question Presentation, Dialogue, and Discussion	Practice Practice Practice Practice	Model Model Multiple Colors Diagrams	10 minutes 10 minutes 10 minutes 15 minutes	Checklist Rating Scale Rating Scale Rating Scale
Introduction	Review the previous educational units and emphasize the provision of all necessary materials for each educational unit, as well as the preparation of the devices to be used.				

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Presentation of the Skill	Prepare all the raw materials required for the educational unit. The rubber ball needed for the model is prepared, and one of the students in the group coats it evenly with glue using a brush. Meanwhile, another student in the group prepares the wool threads and wraps them around the ball in a sequential pattern or spider web weaving style, hiding the ends of the wool threads without tying them, attaching the finished part to the new part or new color to blend multiple colors according to the student's creativity and preference or the specific task. Spray the intertwined and glued threads on the rubber ball with colored or gold and silver spray to enhance its aesthetic appeal or to organize and coordinate the decorative elements.
Summary and Assessment	After completing the skill work, it is displayed before the students for evaluation and feedback.
Homework	Write a report about the skill, not exceeding one page.

Appendix (3)

Skill Performance Assessment Form

Student Name: Time: Group: Skill Name:

No.	Items	Excellent (5)	Very good (4)	Good (3)	Average (2)	Poor (1)
1	Executes an initial design of the topic.					
2	Identifies the components of the topic.					
7	Specifies the precise measurements of the topic.					
9	Considers balance among the components of the topic.					
11	Demonstrates harmony among the components.					

Highest score = 10 × 5 = 50

Lowest score = 1 × 5 = 5