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Effect of the MURDER Strategy on the Achievement of Fifth-grade High School Students in Subject of Philosophy and Psychology and Outgrowth of their Pivotal Thinking

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Abstract: The research aims to explore the effect of the MURDER strategy on the academic achievement and critical thinking development of fifth-grade literary stream female students. To achieve this objective, three null hypotheses were formulated. The experimental approach with two equivalent groups was selected, using both post-achievement and pre-and post-critical thinking tests. The experiment was conducted during the second semester of the 2023–2024 academic year. The sample consisted of 67 students, with 33 in the experimental group and 34 in the control group, chosen randomly. The two research groups were matched based on the following variables: students' chronological age (in months), intelligence test scores, critical thinking test results, and parents' educational attainment, the researcher developed behavioral objectives for the academic material, resulting in a final list of 64 behavioral objectives. Based on these objectives, 12 instructional plans were prepared, and their suitability was confirmed by a group of experts and evaluators. Two research tools were designed: an achievement test, consisting of 30 items in its final form, and a critical thinking test, both of which were verified for validity and psychometric properties. The reliability of the test items was also established. after statistically analyzing the data using the statistical software package, the research results showed:

A statistically significant difference at the 0.05 level between the mean achievement scores of the experimental group students taught using the proposed strategy and the control group students taught using the conventional method, in favour of the experimental group. a statistically significant difference at the 0.05 level between the mean critical thinking scores of the experimental group students taught with the proposed strategy and those of the control group students taught with the conventional method, in favour of the experimental group, a statistically significant difference at the 0.05 level between the pre-and post-critical thinking test scores of the experimental group students taught with the proposed strategy, in favour of the post-test scores, based on these findings, the researcher has set forth several conclusions, recommendations, and suggestions.

Keywords: MURDER Strategy, Achievement, Outgrowth, Pivotal Thinking.

1. Introduction

Most academic subjects are taught through traditional methods that focus solely on theoretical aspects, without attending to student engagement with educational situations. This lack of engagement leads to a decrease in students' academic performance and achievement. The underlying reason for this issue is the teachers' unfamiliarity with modern teaching strategies and methodologies. As a result, students often struggle to think critically and apply their knowledge effectively in learning and problem-solving contexts. This does not imply that their thinking abilities are weak or that they lack cognitive skills; rather, they possess sound thinking skills but have not received adequate guidance or proper supervision. Thus, they lack the training and practice necessary to develop various thinking skills.

Based on this observation, the researcher noted that despite the presence of significant advancements and the necessity to keep pace with them, the reality remains different. Traditional teaching methods render the student a mere recipient of information and instructions without engaging in discussions, dialogues, critiques, analyses, or conclusions that lead to the discovery of truths. This situation results in the student losing the spirit of inquiry and sound thinking while neglecting to encourage thinking, especially critical thinking.

Consequently, the researcher identified that the current research problem lies in the necessity for modern methods and strategies that consider effective knowledge construction to create a suitable learning environment, such as the murder strategy. A learner exposed to real and significant problems requires an understanding and assimilation of knowledge to engage in non-traditional cognitive processes, including critical thinking, which is one of the most important contemporary thinking types that empower students to discover information independently rather than relying on rote memorization.

Training in thinking skills generally and Pivotal Thinking specifically is not an easy task. It requires continuous effort to achieve proficiency, which can be facilitated by developing suitable educational content that ultimately unlocks learners' creative potential. Some researchers argue that training in thinking skills should commence in the early stages of education, as this enhances students' cognitive abilities to navigate their surroundings effectively.

Accordingly, the current research problem is framed by the following question: "What is the impact of the murder strategy on the academic achievement of fifth-grade literary students in psychology and the development of their Pivotal Thinking skills?

Significance of the Research

Recent teaching strategies have emerged that transition the educational process from a teacher-centered approach to a learner-centered one, emphasizing the learner's role and making them the focal point of the educational experience. Additionally, these strategies promote self-directed learning. One such strategy is the M.U.R.D.E.R strategy, developed by Donald Dancerio, which has demonstrated its effectiveness in organizing thoughts, details, reasoning, and distinguishing between opinions and facts, as well as in understanding and recalling information. This strategy ultimately facilitates comprehension and the formation of connections between the learned material and prior knowledge (Harris, 2011, p. 37). Several studies, including those conducted by (Hamoudah 2007), and (Shawn and Mohammad 2009) have shown the superiority of the experimental group and highlighted its significance in enhancing achievement compared to traditional methods.

This strategy is based on the constructivist theory that focuses on the learner and his activity during the educational process and considers it as a result of mental construction because the learner learns new information by organizing it with previous (available) information, it moves the learner away from superficial learning and deaf memorization of concepts and facts, and transfers it to self-understanding of principles and concepts, and then interpret what is happening and predict its occurrence, and so the process of understanding is an adaptive process by adding new information to previous information or modifying it (Zeitoun, 2007 : 60), because the constructivist theory emphasizes the importance of learning through context, and therefore the learner is no longer static, but rather acquires new concepts and knowledge and develops himself by himself to remain in a renewed, continuous and interactive world with others (Al-Shammari, 2014 : 14).

Thinking has received significant attention from theorists, scientists, philosophers, and researchers throughout history as it is a developmental phenomenon that evolves

through different life stages, as emphasized by Piaget. Thought is what distinguishes humans from other creatures and what differentiates one individual from another. Albert Einstein famously stated, "The world we have created is a product of our thinking; it cannot be changed without changing our thinking." Similarly, Descartes, reflecting on his existence, concluded, (Am I there?) I'm thinking, that's why I exist...)) ،For humans, thought is fundamental; without it, humanity holds little value. Thought is thus the foundation of a nation's advancement, progress, and prosperity. If students do not learn how to think, how can they continue learning?

Here lies the importance of Pivotal Thinking skills as fundamental tools for effective thought, highlighting the need to activate and teach them to students. Pivotal Thinking encompasses specific processes that students practice to organize, retain, and utilize information in their memory. Modern educational trends in curriculum development in many countries increasingly prioritize thinking skills as central objectives of teaching and learning. Moreover, teaching and training students in thinking skills has become a responsibility for educators and educational curricula, which should aim to equip students with essential thinking skills that help them adapt to changing conditions (Hunter, 1991, p. 73).

Among the most significant types of thinking skills discussed in educational literature are Pivotal Thinking skills, often referred to as cognitive or foundational thinking. These have become part of modern educational directives, though there is some debate among educators regarding the specific skills and their importance (Al-Absi, 2009, p. 219). Such skills contribute to enhancing learners' awareness, thinking abilities, and mental capacities, allowing them to handle various educational situations effectively. They also promote flexible thinking, fostering intellectual growth and optimizing learning processes.

As noted by) Ubaidat and Abu Saeed 2013), Pivotal Thinking skills are among the most relevant and frequently utilized in classroom teaching practices (Ubaidat & Abu Sameed, 2013, p. 351).

The importance of this research lies in the following:

1. The significance of psychology as an academic subject with unique characteristics and educational value, which fosters students' personal development and imparts essential knowledge. The teaching and learning of psychology at various educational levels contributes to students' overall growth.

2. The value of teaching Pivotal Thinking skills stems from its potential to enhance students' cognitive efficiency, improve their academic performance, and bolster their confidence in addressing academic and real-life challenges. Such skills benefit both students and teachers by encouraging a lifelong pursuit of knowledge and success.

3. The importance of the secondary education stage as it precedes the university level, where students choose a field of specialization. This stage prepares students to specialize in a specific scientific field, making it essential for their academic and professional development.

4. Providing researchers and graduate students with findings from this study to support related research, complement existing studies, and address gaps in educational research, particularly in areas that have been under-explored.

Research Objectives

The current study aims to explore the impact of the murder strategy on:

1. The academic achievement of fifth preparatory grade female students in the subjects of philosophy and psychology.

2. Developing their Pivotal Thinking skills.

Research Hypotheses

To achieve the research objectives, the following hypotheses were formulated:

1. There are no statistically significant differences at the 0.05 significance level between the average achievement scores of the experimental group students, who study using the M.U.R.D.E.R. strategy, and the control group students, who study using conventional methods.

2. There are no statistically significant differences at the 0.05 significance level between the average scores of the experimental group students, who study using the M.U.R.D.E.R. strategy, and the control group students in the Pivotal Thinking skills test.

3. There are no statistically significant differences at the 0.05 significance level between the pre-test and post-test average scores of the experimental group students, who study using the M.U.R.D.E.R. strategy, in the Pivotal Thinking skills test.

Research limited

1. Fifth-grade literary track female students in daytime secondary and preparatory schools affiliated with the General Directorate of Education in

2. Wasit/ Kut Education Department.

3. Second semester (2023–2024).

4. Topics from the first and second chapters of the textbook Principles of Philosophy and Psychology for fifth-grade literary track students.

Definition of Terms

Murder Strategy

1. **Shaun and Mohannad (2009)** defined it as "a type of information processing used systematically across various situations, specifically in preparation for an anticipated test, relying on information retained in memory" (Shaun & Rehyo, 2009, p. 241).

2. **Glaser (2014)** described it as "a strategy based on principles of cognitive structures, following six sequential steps: Mood, Understand, Recall, Digest, Expand, and Review" (Glaser, 2014, p. 219).

Operational Definition of the MURDER Strategy: This is a set of instructional procedures involving a series of sequential processes that the researcher will use in teaching philosophy and psychology to the experimental group of fifth-grade literary track students.

Academic Achievement

1. Al-Khayyat (2010): Defined as "the extent to which educational goals are achieved within a subject or curriculum previously studied or trained through certain tasks or assignments" (Al-Khayyat, 2010, p. 73).

2. Hussein (2011): Defined as "the information, facts, concepts, and principles acquired by students through a program aimed at enhancing their adaptation within their social environment" (Hussein, 2011, p. 176).

Definition by the Researcher:

The researcher defines it as the amount of psychological information, facts, and concepts that fifth-grade literary track female students acquire while studying the subjects of philosophy and psychology, which is measured through the scores they achieve in the achievement test conducted by the researcher at the end of the experimental period.

Pivotal Thinking

1. Nofal and Al-Rimawi (2008): Defined as a mental process applied consistently to achieve a specific goal, encompassing a list of twenty-one core thinking skills categorized into eight main categories. This classification of thinking skills provides students with a method for organizing their thinking to become proficient thinkers (Nofal & Al-Rimawi, 2008, p. 33).

2. Abu Jado and Mohammed (2013): Defined as "a set of specific mental processes used in a structured manner to achieve a particular objective" (Abu Jado & Mohammed, 2013, p. 78).

The researcher defined Theoretical Definition of Pivotal Thinking "the mental processes and activities students engage in when presented with a stimulating learning situation. They attempt to find an appropriate solution by utilizing active and effective thinking, employing the eight main and twenty-one sub-skills acquired through the academic curriculum, which will be detailed subsequently."

The researcher defined Operational Definition of Pivotal Thinking: It refers to the mental processes employed by fifth-grade literary track female students in gathering and recalling information, observing, formulating questions, and organizing information through comparison, classification, representation, ordering, and analysis. These processes are aimed at identifying characteristics, relationships, main ideas, errors, and generating ideas. The degree of pivotal thinking is assessed based on the scores obtained in the pivotal thinking test prepared for research purposes.

M.U.R.D.E.R Strategy:

The scholar Donald Dansereau is credited with developing this strategy, which consists of a series of steps that learners use to understand the material, facilitating their process of acquiring concepts and facts, comprehending information, and storing it. The Murder strategy includes steps, where each step corresponds to an acronym: Mood, Understanding, Recall, Digesting, Expansion, and Review. This strategy was originally designed for text processing and comprehension (Dansereau, 1985: 222), as mentioned in the study by Al-Masri (2009: 344).

Dansereau tested his strategy on a group of students at the University of Texas to assess their understanding of text errors after training them for two hours in a single semester lasting 15 weeks. Their performance was significantly better than that of the conventional

group. This strategy demonstrated an improvement in recall, comprehension, and retention of topics by 30-40% (Shawn & Denise, 1994: 1066). It was found that students continued to use the strategy after the training period, enjoying it because it encourages individualized learning when instructions and guidance are given correctly. Additionally, learners benefit from learning effectively in small groups or pairs, as confirmed by the study by Bernhard & Heinz (2004), which highlighted the effectiveness of using the Murder strategy in dual instruction for processing both academic and technical texts more than when used individually (Bernhard & Heinz, 2004: 3-4). The M.U.R.D.E.R strategy is a teaching method based on organizing information and grounded in constructivist theory, enabling learners to engage in processing large amounts of information (Abdul, 2016: 199).

Barakat (2010) argues that this approach is based on connecting new educational material or parts of it with old or familiar information (Barakat, 2010: 2532).

Steps of the M.U.R.D.E.R Strategy

The M.U.R.D.E.R strategy is based on the first letter of each cognitive process that constitutes mental operations, as follows:

1. Mood

Maintain a positive mood for studying. Choose the appropriate time and environment for this (Qatami, 2013: 369). Dansereau suggests that there are two main methods for ensuring the learner's mood is positively oriented: the first method involves creating positive situations to overcome fear and reluctance to study in any way, while the second method is to manage distractions (Hayes, 1989: 182). Al-Zayyat (1998) states that long-term memory is affected by the emotional rhythm of the material being learned; it is influenced by whether the material is clear and harmonious with the learner's mood, which in turn affects attention, focus, and interest in the material. The similarity of the learner's mood during the encoding and retrieval processes also impacts memory (Al-Zayyat, 1998: 414).

2. Understanding

In this step, the important and challenging ideas and concepts in the subject are identified and marked by underlining unclear information or words (phrases, concepts, or terms). The learner can break down difficult words and trace them back to their original source. The learner should think carefully about the context of the text to understand the relationships and begin processing the highlighted parts (Hayes, 1989: 182; Qatami, 2013: 369).

3. Recall

This step represents the learner's ability to retrieve information by dividing it into parts and then recalling the smaller parts one by one until reaching the larger parts, thereby facilitating comprehension. Dansereau emphasizes that when studying, it is crucial to arrange the information into groups (divided into parts) from difficult to easy, which facilitates the retrieval of information and main ideas (Shawn & Denise, 1994: 1068). During the recall process, the learner activates a specific concept from the knowledge network. Through this activation, the concepts return to short-term memory, allowing the learner to remember them. Recall is the process of extracting information from long-term memory to short-term memory (Al-Zuq, 2012: 196).

4. Digest

In this step, the learner revisits information they did not understand and reads it again, using previously learned concepts to aid in comprehending subsequent material

(Dansereau, 1985: 42). The learner may also refer to external resources such as other books or browse the internet (Qatami, 2013: 369). This step serves as an extension of the second step (Understanding), as comprehension and digestion facilitate the understanding of the material and address issues of forgetfulness and information retrieval.

5. Expand

In this step, the learner connects previous information and experiences with new information (Hayes, 1989: 141). The learner begins to ask questions that arise in their minds or relates current topics to daily events and facts, seeking information while attempting to link sentences together, thereby creating a summary of the chapter that integrates previous knowledge with new insights (Alexander, 1988: 105).

6. Review

In this final step, the learner recalls the methods that aided their understanding and retention of information, such as recitation, writing, and using diagrams. They utilize these methods for future studies while reviewing their mistakes to understand their causes, enabling them to solve problems and comprehend the material effectively (Dansereau, 1985; Harris, 2011: 37-41).

Pivotal Thinking

Pivotal thinking is a type of thinking that encompasses various cognitive processes, including critical thinking, Inferential Thinking, creative thinking, problem-solving strategies, decision-making, and concept formation (Jarwan, 2007: 44).

Pivotal thinking is considered a type of thinking that must be developed early on. It consists of a set of interconnected and overlapping sub-skills, representing the cognitive abilities that individuals need to acquire (Fellerstein, 2005: 22). According to Oxman and Michell (2005), pivotal thinking comprises eight essential skills, which consist of interconnected and related sub-skills, making it challenging to separate each skill individually (Oxman & Michell, 2005: 123).

These skills enable students to maximize the benefit from the information they acquire, the experiences they undergo, and the knowledge they receive from their surroundings (Mathews, 2006: 2). The primary goal of developing these skills is to empower students to learn how to obtain knowledge, not just to learn information (Galyan, 2003: 84). Saada (2003) emphasized that pivotal thinking involves specific mental processes that individuals intentionally use to process information and data to achieve various educational objectives, ranging from recalling information and describing things to making predictions, classifying objects, establishing evidence, solving problems, and achieving coherence (Sa'ada, 2006: 77).

Developing Pivotal Thinking Skills:

Pivotal thinking is not an end in itself, but rather a means to discover truths, laws, generalizations, and scientific concepts, enriching knowledge with further cognitive advancement. Therefore, pivotal thinking remains an urgent necessity in the teaching process for the following reasons:

1. Students need pivotal thinking to understand the relationships between parts of scientific knowledge, which consist of theories, laws, principles, concepts, and facts.

2. Students require pivotal thinking to train themselves in interpreting the phenomena and scientific events surrounding them.

3. Pivotal thinking is essential for implementing all educational activities conducted by teachers.

4. The teaching process enhances students' ability to conduct and practice scientific research, which is intertwined with thinking and its skills (Nashwan & Jubran, 1999: 56).

Developing pivotal thinking skills requires teachers to understand students' capabilities and interests, be tolerant of mistakes and successes, and allow experimentation that includes unconventional and challenging questions (Woolfolk, 1995: 135).

Silver (2006) confirms that pivotal thinking skills can be developed in students if they are prepared and planned for systematically, providing the necessary tools that positively influence the process of developing pivotal thinking skills (Silver, 2006: 1), Pivotal thinking skills are essential in various aspects of life, especially in education. Individuals need to acquire and master these skills to become successful in life and excel in their studies. It is crucial to cultivate these skills in students, as they equip them with the thinking tools necessary for their lives and enhance their ability to focus, gather information, remember, organize information, analyze, generate ideas, synthesize concepts, and evaluate. Furthermore, the development of pivotal thinking skills increases the level of cognitive abilities and academic achievement that students experience or the knowledge they receive from their surroundings (Al-Buraidi, 2008: 328).

2. Materials and Methods

First: Study Methodology:

The researcher utilized the experimental method, as it is suitable for the goals and hypotheses of this research. The experimental method is recognized as one of the most effective and efficient approaches, relying on observation, experimentation, induction, and comparison.

Second: Study Population:

The study population comprises female students in the fifth literary grade at secondary and intermediate day schools for boys in Wasit Governorate, specifically within the Kut Education Department, for the academic year 2023-2024. The researcher visited the General Directorate of Education in Wasit Governorate - Kut Education Department (Statistics and Planning Division) to identify the schools where the experiment would be conducted. She obtained the names of eight schools, with a total of 525 female students in the fifth literary grade, according to statistics provided by the Educational Planning Division of the General Directorate of Education in Wasit Governorate.

Third: Research Sample

The researcher selected Al-Karima Secondary School for Girls as the site for the experiment. A random selection method was employed to choose Section (B) to represent the experimental group, which will be taught using the M.U.R.D.E.R strategy, while Section (A) will serve as the control group, which will be taught using traditional methods. The total number of students in both sections was 71, with 35 students in Section (B) and 36 students in Section (A). Data from students who had previously failed in the subjects were excluded to prevent their prior knowledge from influencing the dependent variable and, consequently, the accuracy of the results. After this exclusion, the sample size was adjusted to 67 students, comprising 33 students in the experimental group and 34 students in the control group. Table 1 illustrates this.

Table (1)
Number of Students in the Research Groups Before and After Exclusion

Group	Number of students before exclusion	Number of excluded students	Number of students after exclusion
Experimental	35	2	33
Control	36	2	34
Total	71	4	67

Fourth: Control Procedures

The researcher ensured that before commencing the experiment, measures were taken to control factors that might influence the validity of the research results. This was done by verifying the internal validity of the experimental design, to ensure the internal validity of the experimental design, some extraneous variables that could affect the dependent variable, aside from the independent variable, were controlled before starting the experiment. The first experimental group was exposed to the independent variable, which is the proposed strategy, while the second control group was taught using the traditional or conventional teaching method. Both groups were selected randomly.

The term "achievement" refers to the first dependent variable, which is measured through the post-achievement test prepared by the researcher. The term "central thinking" refers to the second dependent variable, which is measured through the pre- and post-central thinking tests developed by the researcher for both groups.

Fifth: Equivalence of the Sample

The researcher was keen to ensure the equivalence of the participants in both research groups statistically in some variables that were believed to affect the integrity of the experiment. These variables include:

1. Age of the Participants Measured in Months

The researcher found, after conducting statistical analysis, that the mean age of the experimental group was (195.42) months, with a standard deviation of (4.14), while the mean age of the control group was (194.74) months, with a standard deviation of (2.74). After employing the independent (t-test) to determine the significance of the statistical difference between the experimental and control groups, the results indicated no statistically significant difference between the two groups. The computed t-value was (0.81), which is less than the critical t-value of (2.00) at a significance level of (0.05) with (65) degrees of freedom.

Table (2)
Results of the t-test for the Study Groups in Chronological Age Measured in Months

Group	count	mean	Standard deviation	Degrees of freedom	t-test		Level of Significance 0.05
					calculated	critical	
Experimental	33	195,42	4,14	65	0,81	2,00	Non-significance
Control	34	194,74	2,74				

2- Intelligence Test

The researcher administered the Raven's Progressive Matrices test to participants in the study sample. This test was applied to students in both the experimental and control groups prior to the intervention. The test duration was 40 minutes, and it was scored with one point awarded for each correct response and zero for incorrect responses, resulting in a maximum possible score of 60.

The experimental group had an average intelligence score of 36.12, with a standard deviation of 6.59, while the control group had a mean score of 35.47, with a standard deviation of 5.34. To determine the statistical significance of the difference between the two groups, an independent samples t-test was used. The results indicated no statistically significant difference at the 0.05 level, with a calculated t-value of 0.45, which is lower than the critical t-value of 2.00 at 65 degrees of freedom.

Table (3)

Results of the t-test for Intelligence Scores of the Study Groups

Group	count	mean score	Standard deviation	Degrees of freedom	t-test		Level of Significance 0.05
					calculated	critical	
Experimental	33	36,12	6,59	65	0,45	2,00	Non-significance
Control	34	35,47	5,34				

3-Educational Level of Fathers

To ensure the equivalence of the two study groups based on the educational attainment of the fathers, the researcher used school records and directly verified information from the students themselves through a specially designed questionnaire. The educational levels of the fathers were classified into three categories based on their academic attainment. Using the Chi-square test (χ^2), the calculated Chi-square value was found to be 0.23, which is lower than the critical value of 5.99 at the 0.05 significance level with 2 degrees of freedom. This result indicates equivalence between the two groups regarding the educational level of the fathers, as shown in Table 4.

Table (4)

Equivalence of Fathers' Educational Levels of the Study Groups: Calculated and Critical Chi-square (χ^2) Values, Degrees of Freedom, and Significance Level

Group	Educational Level of Fathers			count	Degrees of freedom	Chi-square value		Level of Significance 0.05
	Intermediate	secondary	institute			calculated	critical	
Experimental	12	9	12	33	2	0,23	5,99	Non-significance
Control	12	11	11	34				

4-Educational Level of Mothers

The researcher assessed the equivalence of the two study groups regarding the educational attainment of the mothers through school records and also verified the information directly from the students using a questionnaire prepared by the researcher. The levels of mothers' educational attainment were classified into three categories based on their educational levels. Using the Chi-square test (χ^2), it was found that the calculated value was 0.50, which is lower than the critical value of 5.99 at the 0.05 significance level with 2 degrees of freedom. This indicates equivalence between the two study groups regarding the educational attainment of the mothers, as illustrated in Table 5.

Table (5)

Equivalence of Mothers' Educational Levels in the Study Groups: Calculated and Critical Chi-square (χ^2) Values, Degrees of Freedom, and Significance Level

Group	Educational Level of Mothers			count	Degrees of freedom	Chi-square value		Level of Significance 0.05
	Intermediate	secondary	institute			calculated	critical	
Experimental	13	11	9	33	2	0,50	5,99	Non-significance
Control	12	10	12	34				

5-Pivot Thinking

The researcher administered the final version of the Pivot Thinking Scale to participants in both the experimental and control groups prior to the start of the experiment to ensure the equivalence of the two study groups in terms of pivot thinking. Following the correction of the responses and the compilation of scores obtained by each student, statistical analysis was conducted. The mean score for the experimental group was 28.03, while the mean score for the control group was 26.86. The standard deviation for the experimental group was 5.05, and the standard deviation for the control group was 4.58.

Upon calculating the significance of the differences between the two means using the t-test, it was found that the calculated t-value (0.914) was less than the critical t-value (2.000) at 53 degrees of freedom. This indicates that the two groups are equivalent in terms of pivot thinking, as detailed in Table 6.

Table (6)
Calculated and Critical t-test Values for the Pivot Thinking Scale of the Experimental and Control Groups

Group	Sample size	mean score	standard deviation	t-test Values		Level of Significance 0.05
				Calculated	Critical	
Experimental	33	28,03	5,05	0,914	2,000	Non-significance
Control	34	26,86	4,58			

Fifth: Identification and Control of Extraneous Variables

To prevent these extraneous variables from affecting the research results, it is essential to control them. The researcher made every effort to control these extraneous variables that could influence the internal and external validity of the experiment, as their control leads to accurate results. The following are some of these variables:

1. Accompanying Events:

The experimental conditions were maintained uniformly across both the experimental and control groups. The research experiment was not subjected to any interruptions that could affect the dependent variable. The experiment proceeded normally, with no disruptions to its procedures or conditions, except for a few minor interruptions. Any missed lessons were compensated with additional school days, ensuring no impact on the research results.

2. Experimental Attrition:

Experimental attrition refers to the effects resulting from the dropout of several students participating in the study. Although there were some normal and minimal absences among the students in both groups, this did not impact the progress of the experiment, thus mitigating the effect of this factor.

3. Selection of Sample Individuals:

The researcher selected the sample individuals randomly and statistically matched the students in both research groups concerning certain variables. Additionally, the conditions of the students were nearly identical as they belonged to the same social environment, as they all came from the same local area.

4. Maturation:

Biological, psychological, or cognitive changes may occur in individuals undergoing the experiment during its duration, potentially affecting the results positively or negatively. Since the duration of the experiment was the same for both groups, this factor did not have an impact on the current research.

5. Measurement Instruments:

The researcher utilized two standardized measurement tools for both groups to assess achievement and pivot thinking. The researcher prepared the research tools and administered them to both groups simultaneously. Both instruments were characterized by validity and reliability, and the researcher corrected the responses herself.

6. Impact of Experimental Procedures:

The researcher attempted to minimize the influence of this factor to ensure the external validity of the experimental design and to generalize the results beyond the sample. The experiment required several procedural measures, which included:

a. Confidentiality of the Research:

The researcher agreed with the school administration on the necessity of keeping the research confidential and not informing the students or faculty about the nature and objectives of the research. This was to ensure that they continued their activities and interactions with the experiment naturally, without affecting the accuracy and integrity of the results.

b. Study Material:

The study material designated for the experiment was uniform for both research groups, consisting of topics from the book "Principles of Philosophy and Psychology" for the fifth literary grade for the academic year (2023-2024).

c. Teaching:

The researcher taught the students in both groups in a manner that ensured a degree of accuracy and objectivity, aiming to minimize the influence of this factor on the integrity and results of the experiment. Assigning a single teacher to each group made it difficult to attribute the results solely to the independent variable, as they could be influenced by the teacher's mastery of the material, personal attributes, or other factors.

d. Learning Environment:

The students in both groups received their lessons in a nearly identical educational environment, with classrooms that were similar in terms of lighting, temperature, ventilation, and number of windows.

e. Duration of the Experiment:

The duration of the experiment was uniform and equal for students in both groups (experimental and control).

7. Distribution of Class Sessions:

This variable was controlled by evenly distributing the lessons between the experimental and control research groups. The weekly schedule was organized to include two sessions per week for each group, in coordination with the school administration and the subject teacher to arrange the lesson distribution schedule.

Research Requirements

a. Defining the Study Material:

The study material was confined to the first and second chapters of the prescribed textbook for the fifth grade in the Literary Track. The researcher adhered strictly to the content of the assigned book for both the experimental and control groups to maintain equivalency.

b. Formulating Behavioral Objectives:

To develop instructional plans for both the experimental and control groups, the researcher formulated a total of 79 behavioral objectives based on Bloom's Taxonomy levels (recall, understanding, application, and analysis). These objectives were reviewed by a panel of experts, including specialists in education, psychology, and teaching methods. Minor adjustments were made based on their feedback, with an 80% agreement criterion for inclusion of each item.

c. Preparing Instructional Plans:

In line with the study's procedural requirements, the researcher developed instructional plans for both groups based on the first two chapters of the textbook Principles of Philosophy and Psychology for fifth grade, Literary Track. Sixteen instructional plans were created for the experimental group based on the MURDER strategy, while another sixteen plans were designed for the control group using traditional methods. Sample plans were reviewed by experts for feedback on enhancing their effectiveness, leading to minor adjustments.

Research Instruments

This study required the preparation of two instruments: an achievement test to measure the first dependent variable (academic achievement) and a second test to assess the second dependent variable (pivot thinking). The process of developing each instrument is detailed below:

First: The Achievement Test

The researcher followed several steps to construct this test:

1. Formulating Test Items:

This study necessitated the development of an achievement test to assess the academic performance of fifth-grade students in the Literary Track as part of the research sample. The purpose was to measure the impact of the MURDER strategy on the subject Principles of Philosophy and Psychology. Since there was no pre-existing achievement test suitable for this specific material, the researcher created a new test based on the educational content and the specified behavioral objectives. This test comprised 30 items distributed across Bloom's Taxonomy levels (recall, understanding, application, and analysis) according to a test specification table based on the content of the two chapters and their relative significance, as shown in Table 7.

Table (7)

Test Specification Table for the Achievement Test

Chapter	Number of lessons	Relative Importance	Behavioral Objectives				Number of items
			Recall 30%	Understanding 30%	Application 30%	Analysis 10%	
First	6	40%	4	4	4	1	13
second	10	60%	5	5	5	2	17
Total	16	100%	9	9	9	3	30

1. Test Validity

To verify the face validity of the achievement test, the researcher presented it to a panel of experts and specialists in curriculum development, teaching methods, and educational assessment. They were asked to evaluate how well the items aligned with the test objectives, as well as the clarity and relevance of the item formulation. Based on their feedback, minor modifications were made to certain answer choices in the test items. No items were removed from the test.

2. Pilot Application of the Achievement Test

The researcher conducted a pilot test on a sample of 30 fifth-grade literature students from Al-Tameem Secondary School to determine the time needed to complete the test, assess item clarity, and identify any ambiguous elements. The pilot study showed that the test items and instructions were clear and understandable to the students, as evidenced

by minimal queries during the process. The average time required to complete the test was calculated at 30 minutes.

2.Statistical Analysis of Test Items

To conduct a statistical analysis of the test items, the test was administered to a sample of 100 fifth-grade literature students from three schools (Al-Yusr, Al-Kut, and Al-Zakiat). The researcher followed specific procedures, including scoring students' responses and ranking them in descending order. Then, two groups were formed, each comprising 27% of the highest and lowest scorers, resulting in a total sample size of 54 students for the item analysis. The following analyses were conducted:

a. Item Difficulty Index

The item difficulty index for each test item ranged from 0.37 to 0.77, indicating that the items were acceptable according to the difficulty criteria commonly established in measurement literature, which falls within the range of 0.20 to 0.80.

b. Item Discrimination Index

After calculating the discrimination index for each item, it was found that values ranged from 0.28 to 0.49. According to Stanley (1970), test items with a discrimination index of 0.20 or above are considered satisfactory. Therefore, all items were retained without deletion or modification.

c. Effectiveness of Distractors

Upon analyzing the effectiveness of the distractors, the researcher found that all distractors had negative effectiveness indices, meaning they attracted more responses from the lower-performing group than from the higher-performing group. Consequently, all distractors were retained as initially formulated.

4. Test Reliability

The researcher employed Cronbach's alpha to determine the reliability of the test, which yielded a reliability coefficient of 0.85, indicating a high level of consistency.

5. Test Instructions

a. Response Instructions:

The researcher provided specific instructions for the test, requesting students to read each item carefully before answering and to avoid multiple or omitted responses.

b. Scoring Instructions:

One point was awarded for each correct response, while an incorrect or omitted response received zero points. Items with multiple answers were also treated as incorrect. The final version of the test consisted of 30 items.

Second Instrument: Pivot Thinking Test

The researcher developed a pivot thinking test tailored to the needs of the current study. After reviewing previous studies, such as those by Al-Musawi (2012), Al-Hasan (2014), and Al-Awaid (2014), and finding them unsuitable for this study's objectives and sample, the researcher decided to construct a new pivot thinking test following these steps:

1. Identifying Pivot Thinking Skills:

The researcher consulted relevant literature and previous studies to identify key pivot thinking skills, compiling a list of eight essential skills. After presenting these skills and their definitions to a panel of experts for review, four skills were deemed appropriate based on the sample's age group and the content of the "Principles of Philosophy and Psychology" textbook. ‹Table 8 provides an overview of these selected skills.

Table (8)
Pivot Thinking Skills

Count	Skill	Definition

1-	Information Collection a. Observation b. Question Formulation	• It refers to bringing content for mental processes It means gathering new data. This is the process of refining and clarifying questions during the search process
2-	Organizational Skills 1. Comparison 2. Classification 3. Representation 4. Sequencing	• This skill focuses on arranging information, demonstrating comprehension by: 1. Identifying similarities and differences. 2. Grouping items into categories. 3. Representing ideas through symbols, words, or diagrams. 4. Arranging items according to specific criteria and standards.
3-	Integration 1. Summarization 2. Reconstruction	• This involves aligning interconnected elements to promote a deeper understanding. It represents the learner's ability to extract core ideas from a text, achieving clarity in meaning. It also involves restructuring knowledge to integrate new information.
4-	1. Analysis 2. 1.Identifying Characteristics and Components 3. Identifying Relationships and Patterns 4. Identifying Errors 5. Identifying Key Ideas	Analysis refers to refining data by examining parts, assumptions, and relationships, distinguishing components, features, claims, and assumptions to uncover internal ideas. • This includes focusing on details, structures of objects, ideas, and designs, recognizing internal relationships among components, identifying logical errors in arguments, calculations, procedures, and data, and determining key ideas to reveal patterns and relationships.

2-Formulation of Test Items:

After agreeing on the skills of pivot thinking, which are (information gathering, organization, integration, analysis), the researcher reviewed pivot thinking tests (Al-Moussawi, 2012) and (Al-Awaid, 2014). Since the two tests were in the fields of chemistry and mathematics, the researcher prepared a test consisting of (42) items that relied on behavioral situations and various formulations of questions, including both objective and essay types, based on the nature of the definitions of each main and sub-skill.

3-reliability of the test:

To achieve reliability of the test, the researcher presented the test, its skills, definitions, and the distribution of its questions to a group of experts and specialists in curricula and teaching methods to provide their opinions regarding the appropriateness of the pivot thinking skills test questions, the clarity of the items, and the accuracy of their formulation. Their suggestions and observations aimed at improving the test were noted, with an agreement threshold of (80%) or more from their opinions. Consequently, several questions were modified and reformulated to align with the level of the research sample, thus ensuring the researcher achieved face validity for the test.

4-Pilot Application of the Pivot Thinking Skills Test:

The researcher administered the test to the same pilot sample used for the achievement test to assess the clarity of the test items and instructions and to determine the test duration. It was found that the items and instructions were clear, resulting in an average time of (25) minutes.

5-Statistical Analysis of the Test Items:

To analyze the items of the pivot thinking test and identify their difficulty and discriminative power, the researcher applied the test to the same statistical analysis sample used for the achievement test as follows:

A-Discrimination Index of the Items:

To assess the discrimination of the pivot thinking test items, the researcher applied the test to the same statistical analysis sample of the achievement test. Upon applying the discrimination power formula to each item, it was found that the values ranged between (0.37 - 0.62), indicating a good level of discrimination for the test items.

6-Reliability of the Pivot Thinking Skills Test:

The researcher applied the test to the same pilot sample to measure the reliability of the achievement test. Using the Kuder-Richardson-21 formula, the reliability test yielded a coefficient of (0.85), indicating a good level of reliability. The researcher also utilized the Cronbach's alpha formula to assess the test's reliability, resulting in a value of (0.82), signifying a high degree of reliability for the test.

7-Reliability of the Scorers:

Considering the model answers, the responses of the pilot sample participants to the pivot thinking test items were scored by one of the colleagues. Using the Kopr coefficient, the agreement rate was found to be (0.83), indicating a high reliability coefficient, thus making the test ready for administration.

8-Scoring the Test:

The test items were scored on a (0, 1) scale, where the researcher assigns (1) for a correct answer. If the responses were incorrect or omitted, a score of (0) was assigned. This resulted in total scores ranging from (0 - 42), finalizing the test in its complete form.

Eighth: Implementation of the Experiment:

After the researcher determined the research sample and divided it into two equivalent groups (experimental and control) and prepared the tools and teaching plans, the researcher administered the pivot thinking test to both the experimental and control groups. The researcher taught both groups personally using the Murder strategy for the experimental group and the conventional method. The experiment lasted for (8) weeks, with two sessions per week for each group.

After completing the experiment, the researcher administered the post-test for pivot thinking to both the experimental and control groups and then conducted the achievement test.

The researcher had predetermined the test date in advance to prepare the students. The researcher personally conducted the test for both groups. After finishing the test for the experimental group, the same day, she administered the test to the control group. The separation of each group into different schools facilitated this process. The researcher distributed the post-test papers to the students, instructed them to write their names, and asked them to answer all test items after reading the instructions and items carefully. The researcher then scored the students' responses and collected the data.

Sixth: Statistical Methods

The researcher utilized statistical software for the research procedures and data analysis.

Presentation and Interpretation of Research Results:

The research results will be presented according to the sequence of the research hypotheses and objectives:

First Hypothesis: This hypothesis pertains to the first dependent variable (a accomplishment).

After correcting the students' answers, the results showed that the average score of the experimental group was (24.15) with a standard deviation of (3.43), while the average score of the control group was (18.96) with a standard deviation of (4.56). Using the independent samples t-test to compare these two means, the calculated t-value was (4.76), which is greater than the tabulated value of (2.000) at a significance level of (0.05) and with (53) degrees of freedom, as shown in Table (9).

Table (9)
Results of the t-test for the post-test scores of the experimental and control groups

Group	count	mean	Standard deviation	Degrees of freedom	t-test		Level of Significance 0.05
					calculated	critical	
Experimental	26	24,15	3,43	53	4,76	2,000	significance
Control	29	18,96	4,56				

This indicates that there are statistically significant differences between the average scores of the research groups in the achievement test, favoring the experimental group, which studied the specified course material during the experiment using the murder strategy, compared to the control group who studied using the traditional method. In light of this result, the first null hypothesis is rejected.

Hypothesis Two: This hypothesis pertains to the second dependent variable (pivot thinking).

After correcting the students' responses, the results indicated that the mean score for the experimental group was (34.26) with a standard deviation of (4.44), while the mean score for the control group was (29.48) with a standard deviation of (4.64). Utilizing the t-test for independent samples to compare these two means, the calculated t-value was found to be (4.19), which is greater than the critical value of (2.000) at a significance level of (0.05) with (53) degrees of freedom, as shown in Table (10).

Table (10)
Results of the t-test for the post-test of pivot thinking for the experimental and control groups.

Group	count	mean	Standard deviation	Degrees of freedom	t-test		Level of Significance 0.05
					calculated	critical	
Experimental	26	34,26	4,44	53	4,19	2,000	significance
Control	29	29,48	4,64				

This indicates a statistically significant difference between the mean scores of the research groups in the Pivot Thinking test, favoring the experimental group, which was

taught using the Murder strategy, compared to the control group that was taught using traditional methods. In light of this, the second null hypothesis is rejected.

Hypothesis Three: This hypothesis also relates to the second dependent variable, Pivot Thinking:

To verify this hypothesis, the researcher compared the pre-test and post-test results of the experimental group in Pivot Thinking. The results showed that the mean score of the pre-test was (28.03) with a standard deviation of (5.05), while the mean score of the post-test was (34.26) with a standard deviation of (4.44). Using the paired sample t-test to compare these two means, the calculated t-value was (11.323), which is greater than the table t-value of (2.06) at the significance level of (0.05) with (25) degrees of freedom, as shown in Table (11).

Table (11)
Results of the t-test for Pre-Test and Post-Test of Pivot Thinking for the Experimental Group

Group	count	test	mean	Standard deviation	Mean of differences	Standard deviation of differences	Degrees of freedom	t-test		Level of Significance 0.05
Experimental	26	pre-test	28,03	5,05	6,307	2,842	25	11,323	2,06	Statistical Function
		post-test	34,26	4,44						

This indicates a statistically significant difference between the mean scores of the pre-test and post-test of pivot thinking among the students in the experimental group, favoring the post-test. This suggests that the Murder strategy has an effect on the development of pivot thinking among the students in the experimental group, and thus, the null hypothesis is rejected.

The Results

Hypothesis One:

The superior performance of the experimental group, which was taught using the Murder strategy, compared to the control group, which was taught through traditional methods, can be attributed to the effectiveness of the Murder strategy in teaching psychology. This method allows students to adopt a positive and active stance in the learning process, given the numerous complex procedures and operations they engage in, positioning the students at the center of the learning process. By actively involving themselves in what they are learning, the students' self-confidence is enhanced, leading to more fruitful and effective learning experiences. The teacher's role in the Murder strategy is to guide and organize the educational situations, facilitating students' access to facts and information independently and more swiftly. This, in turn, motivates students to inquire and research, fulfilling their needs and interests, and allowing for direct interaction between the students and their learning content. This increased responsibility in the educational process improves their learning outcomes, resulting in higher scores in the psychology achievement test.

Hypotheses Two and Three:

The researcher attributes these results to the Murder strategy's role in developing pivot thinking among fifth-grade students in addressing scientific situations in the subject of the principles of philosophy and psychology using pivot thinking skills. During the implementation of the strategy's steps, it encourages students to engage in active pivot

thinking through diverse educational activities, thus motivating them to apply what they have learned in philosophy and psychology. Engaging with pivot thinking in various forms has broken the stagnation the students had become accustomed to in traditional methods. Additionally, the guiding role of the teacher empowers students to achieve a deeper understanding through pivot thinking compared to traditional approaches.

Conclusions:

1. The Murder strategy outperformed traditional methods in the achievement of fifth-grade students in the subject of the principles of philosophy and psychology, as well as in the development of their pivot thinking.
2. The Murder strategy made the lessons more dynamic and engaging, moving away from the monotony and boredom commonly associated with traditional teaching methods.
3. The effectiveness of the Murder strategy was confirmed within the context of this study, demonstrating significant impacts on improving academic achievement levels.
4. The superiority of the Murder strategy over conventional methods can be attributed to its role in fostering a genuine spirit of collaboration, selflessness, and productive competition to understand and comprehend the subject matter, as well as enhancing speaking and leadership skills among fifth-grade students.

Recommendations:

1. Encourage teachers to move beyond traditional teaching methods and to keep abreast of new instructional strategies that have proven effective in enhancing achievement and developing thinking skills, particularly pivot thinking.
2. Develop a teacher's guide to accompany the textbook that includes modern teaching strategies, including the Murder strategy.
3. Issue a guide that outlines how to teach pivot thinking skills and disseminate it to education colleges in the country for further benefit.

Suggestions:

1. Compare the Murder strategy with other strategies for developing thinking skills and academic achievement.
2. Conduct studies addressing the impact of the Murder strategy on other variables such as attitude, inclination, and self-esteem.
3. Conduct similar studies to the current one in different educational stages and grade levels.

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