



## The Effectiveness of Brainstorming Strategies in Improving the Achievement of First-Year Middle School Students in Chemistry

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### Abstract

This research aims to investigate the effectiveness of brainstorming as a strategy in improving the academic achievement of first-year middle school students in chemistry, focusing on its role in enhancing their understanding of scientific concepts and developing their scientific and creative thinking skills. The research employed an experimental design with two groups: an experimental group and a control group. A pre-test and a post-test were administered to measure the impact of the experimental treatment. The study sample consisted of 60 students, equally divided between the two groups. The experimental group was taught using the brainstorming strategy, while the control group received instruction using the traditional method. The results showed a statistically significant difference between the mean scores of the two groups on the post-test, favoring the experimental group. This indicates the effectiveness of brainstorming in improving academic achievement and understanding of chemical concepts. The strategy also contributed to enhancing students' active participation, increasing their motivation to learn, and developing their creative and analytical thinking skills. Based on these results, the researcher recommends training teachers in the use of the brainstorming strategy, incorporating brainstorming-based educational activities into the curriculum, and fostering an interactive classroom environment that stimulates thinking and creativity.

**Keywords:** Brainstorming strategy, Academic achievement, Chemistry subject, first intermediate grade

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### Introduction

It is considered the process Educational from Pillars Basic in building a personality student and development His abilities mentality and cognitive so it aims to Enabling him from acquisition Knowledge And polish skills thinking Scientific And analytical. And with Developments Modern in Methods Teaching, Head interest about adoption Strategies Educational Interactive Enhances sharing students in picture Effective, and contributes in development Their abilities on thinking Critical and creative. Chemistry is considered one of the basic scientific subjects in the middle school curriculum, as it requires the student to have a deep understanding of scientific concepts and to link them to practical and experimental experiences. However, many students face difficulties in grasping these concepts, which negatively affects their academic achievement and calls for the search for innovative teaching methods that enhance their understanding and skills.

Among the modern educational strategies that have proven effective in developing creative thinking and improving academic achievement, the brainstorming strategy comes at the forefront of interactive methods. This strategy allows students the opportunity to express their ideas freely, develop their analytical and comparative abilities, and encourages them to cooperate in a stimulating educational environment, which contributes to enhancing the deep understanding of chemical concepts and their correct application. Based on the above, this research aims to highlight the effectiveness of using the brainstorming strategy in raising the achievement of first-year middle school students in chemistry, by studying the impact of this strategy on

students' academic performance, and determining the extent of its contribution to improving their understanding of chemical concepts and developing their scientific thinking skills.

### Part One: Research Methodology

#### First: Research problem

The educational process in chemistry for first-year middle school students faces many challenges, most notably the difficulty of understanding some abstract scientific concepts that require a high level of thinking and analysis. Classroom observations and semester test results have shown that many students suffer from poor academic achievement, which reduces their ability to comprehend lessons and apply chemical concepts correctly. With the continuous evolution of teaching methods, it has become essential to adopt innovative educational strategies that contribute to developing students' scientific and creative thinking skills and encourage their active participation in the learning process. Among these strategies, brainstorming stands out as an educational tool capable of stimulating students to think freely and exchange ideas, which can lead to improved understanding and higher academic achievement (Torrance, 1974) [20].

Based on this, the research problem is to question the effectiveness of employing the brainstorming strategy in improving the academic achievement of first-year middle school students in chemistry, and its ability to raise the level of their academic performance and enhance their understanding of scientific concepts. The main research question is: "How effective is the brainstorming strategy in raising the achievement of first-year middle school students in chemistry"?

#### Secondly: Importance of the research

1. Highlighting the effectiveness of the brainstorming strategy in developing scientific and creative thinking skills among first-year middle school students.
2. Contributing to improving students' academic achievement in chemistry and increasing their understanding of scientific concepts.
3. Providing modern teaching methods that help teachers diversify their teaching methods and make the lesson more interactive.
4. Enhancing students' ability to actively participate in the educational process and cooperate with their peers.

#### Third: Research objectives

1. Measuring the effectiveness of the brainstorming strategy in improving the academic achievement of first-year middle school students in chemistry, and comparing their performance with students who study in the traditional way.
2. Determining the impact of the brainstorming strategy on students' understanding of chemical concepts and their ability to interpret scientific phenomena and apply laws and principles correctly.
3. Evaluating the role of strategy in developing students' scientific and creative thinking skills, including analysis, synthesis, evaluation, and problem-solving.
4. To propose practical recommendations for teachers, educational supervisors, and curriculum developers on how to employ the brainstorming strategy in teaching

chemistry to enhance student interaction and achieve the best educational outcomes.

#### Fourth: Research hypothesis

There is difference With indication Statistics when Level (0.05) between middle grades students The group empiricism, that Studying on according to strategy Storm mental, and average grades students The group The officer that Studying on according to The method The usual in collection material Chemistry.

#### Fifth: Border Search

- **Limit Time frame:** limited Search on Year Academic Current 2025-2026.
- **Limit Spatial:** limited Search on students the line the first average in Preparatory Victory Preparatory For boys affiliated to Directorate Education in Baghdad / Al-Karsh Second.
- **Limit Human:** includes Search students the line the first average only, no Includes students Stages The other.
- **Limit material or Academic:** Limited Search on study material Chemistry only, Don Other from Materials Academic.
- **Limit Thematic:** focuses Search on effectiveness Use strategy Storm mental in to improve Acquisition Academic.

#### Sixth: Search Terms

- **Effectiveness:** Effectiveness It means ability on investigation Results Desired from education or Teaching, So that He is able learner from acquisition Skills and knowledge Targeted In a way complete, As it appears Effectiveness in bezel investigation The impact Desired that Reflected positively on results Learning The scheduled one, And he points to that measurement Effectiveness He depends on comparison what verification from to learn with Goals Educational Planner Previously. And according to Therefore, for Effectiveness in education Represents capacity learner on Access to Level Required from Performance academic, whether on level Knowledge or Skills, and it is possible Strengthening it Using Strategies Educational Effective like Storm Mental. (Lubna, 2022, 66) [11]
- **Strategy:** is known strategy That she groups from Plans and roads Educational Planner that It uses teacher to achieve Goals Educational Specific. (Shehata, Al-Najjar, 2003, 39) [7].
- **Storm Mental:** Knows Storm mental That he group from Plans and rules public that Directed The process Educational And it aims to incentivize production ideas and opinions creative from Individuals and groups With the aim solution problem specific And it is conducted This is amazing The process in environment Educational It prevails Freedom And safety with the focus on Construction on ideas Others And its development To reach to Solutions Innovative And effective. (Jumah, 2016, 86).  
And within this Context, It is considered strategy Storm mental One Strategies Educational Innovative It aims to incentivize students on thinking Creative Production ideas Multiple To solve The problem And it works This is amazing strategy on to encourage Participation

collectively, Expanding Perceptions Students, and increase ability on Conclusion, In addition to development Their skills in Expression on Ideas and discussing it By sea. (Osborn, 2009, 56) <sup>[16]</sup>

- **Acquisition:** is known Acquisition That he bezel absorption student For information and skills cognitive The scheduled within Curriculum Academic, And it is Its measurement usually from during tools Evaluation different like Tests Editorial oral And the process And reflects Acquisition capacity student on application what Learn it, It is considered indicator whatever To assess effectiveness Strategies Educational The user (Al-Shahrani, 2025, 247) <sup>[19]</sup>.

## Part Two: Theoretical Framework and Previous Studies

### First: Brainstorming Strategy

It is intended With strategy Storm mental that The process Intellectual that It aims to generation Production greater amount maybe from Ideas and opinions Creative whether on Level Individual or Collective, That's For the purpose of Find Solutions Effective For the problem Specific, And it does This is amazing strategy on situation mind in condition from Motivation and stimulation mentality that Allow for him By thinking in bearings Multiple, In what Allows production ideas Various and innovative in environment It is characterized Freedom And openness, where He encourages Individuals on Presentation all Ideas Don restriction or cash Previous (Al-Taraqi, 2023, 157).

As for from where origin linguist term Storm mental, He It indicates to stir mind and mobilization His energies in Confrontation problem Specific As if their condition from the challenge between mind human from side, The problem Intended Solve it from Entity Other. And in this Context Seeks mind to Briefing With the problem from various Its aspects and attempt Treating it Using Methods Multiple in Ideas that Generates quickly density Similar The storm, He is what Explains naming This is amazing the strategy. (Al-Kassab, 2013, 34).

principles strategy Storm Mental: performs strategy Storm mental on group from Principles Basic that It is Essential For success Applying it and investigation Its goals, And from Most prominent This is amazing Principles: (Al-Sabab, 2017, 248)

1. **Availability freedom Thinking:** Availability freedom Thinking is based this Principle on necessity removal Restrictions that may hinders practical thinking In what Allow For the learner liberation from the fear or Frequency during Presentation Ideas And he performs that to create environment Psychological comfortable It is characterized By being open, Which Enhances ability on imagination And creativity as He encourages learners on Presentation ideas not Familiar or until It looks Strange so may Contributes This is amazing Ideas in stir ideas more development I have Others.
2. **Construction on ideas Others:** Consider this Principle from Pillars Basic For the storm mental, where no Limited value The idea on Its owner, but rather It is King joint For all Participants It is permitted For learners Developing Ideas The proposed, and return Its formulation, And the building On it To produce ideas New, Which Contributes in Enrichment discussion and increase number Solutions The possible ones.
3. **Postponement Assessment:** Requires this Principle delay The ruling on Ideas Presented during Stage First

from session, so that evaluation Ideas or Criticism of it early may leads to inhibition Participants, And limits from flow Ideas They have as that the fear from Criticism and feeling With tension They are considered from Factors that hinders thinking Creative, Therefore It should delay Evaluation to phase Suffix after Finish from generation Ideas.

### Second: Goals Strategy Storm Mental

1. It aims strategy Storm mental to investigation group from Goals educational and cognitive from the most prominent of them: (Al-Mousawi, 2025, 5) <sup>[8]</sup>.
2. development capacity learners on Dealing with Problems Educational no Sima in environments Learning electronic, from during Search on Solutions Innovative And creative.
3. Strengthening spirit Interaction and competition Positivity between learners in what Contributes in Activation Participation inside the position Educational.
4. development Abilities mentality for learners, And He made them more flexibility and intelligence in Thinking, And capable on production ideas New.
5. to encourage Benefit from ideas Others from during Developing it and the building on it, In what leads to generation Solutions more maturity and effectiveness.

### Second: Stages And Steps Strategy Storm Mental

Dates strategy Storm mental several stages and steps Basic It should Commitment In it when applying it to solve problem Specific, it is: (Al-Rubaie, 2011, 115) <sup>[12]</sup>.

1. **To Set the problem and discussing it:** it begins the process by specifying the problem accurately after Planning pre- she has, then Analysis of it to Its elements Basic, and organization This is amazing elements in a way Clear, Introduction To display it on Participants and discussing it in a light Ideas The proposed solution.
2. **Redrafting Subject:** To be in This is amazing Stage transformation The problem to group from Questions clear and directly, With the aim incentivize learners on generation Ideas and solutions in a way Simplified And focused.
3. **Generation Solutions and choosing the most suitable:** requested from Participants presentation greater number maybe from Solutions And ideas, then It is Later to choose the best of them and most of them suitability Treatment the problem.
4. **Evaluation Ideas And its development:** is evaluated Ideas that It was completed Reaching To her with the aim Improving it and its development Arrival to Solutions practical midwife for application.

### Fourth: Role of Strategy Storm Mental in to lift Acquisition Academic

It is considered strategy Storm mental from Strategies Educational The impact Clear in to lift level Acquisition Academic I have Students, That's Because she Activate practical thinking They have And it strengthens Their participation The active one in Positions Educational, where it contributes This is amazing strategy in Strengthening thinking Creative and the cash from during to encourage students on generation ideas Multiple, Analysis Problems from Corners Different, Which Contributes in expansion Their perceptions And their understanding For concepts

Study Deeply greater, That's comparison By methods traditional that focus on Preservation and indoctrination That's all (Ibrahim, 2016) <sup>[9]</sup>, (26 as that Storm mental Stimulates Interaction student inside the line, Which He increases from level Engagement And pay attention I have students And contributes in stabilizing Knowledge in memory long The range, He is what Reflected Positively on Their acquisition Academic bonus on that, for sessions Storm mental Enhance skills solution Problems And thinking analytical by force students on thinking in Solutions Innovative And bear responsible production Knowledge, Which It develops They have ability on Dealing with Positions Educational complex and improving Their performance in Tests The achievement. And it Show analysis twist accident that employment strategy Storm mental in education linked b effect middle positive on Acquisition Academic For students, Which It indicates on importance This is amazing strategy As a tool Educational Effective in to improve Results Study via various Materials Educational (Çelik & Akay, 2025) <sup>[5]</sup>.(

### Fifth: Previous Studies

#### Intisar Khairou's study (2021) <sup>[21]</sup>, The effect of the electronic brainstorming strategy on the achievement of second-grade intermediate school students in chemistry.

She sought the study to identification on effect employment strategy Storm mental electronic in development Acquisition Academic I have female students the line the second average in material Chemistry, Please on development Their motivation Towards it and it was formed sample the study From (60) female students, It was completed Their distribution to Two groups: experimental And a female officer (30) female students per A group. And to achieve Goals the study, Prepared Researcher test academically Component (32) paragraphs.

And it was adopted the study on group from Methods Statistics, from the most prominent: square Kai, and coefficient correlation Pearson, and equation difficulty Paragraph, and equation Distinguish it, in addition to Test The letter T For two samples Independent And another for two samples They are interconnected.

And Showed Results superiority female students The group empiricism Those Lessons according to strategy Storm mental electronic on Their counterparts in the group The officer Those Lessons In the way traditional, That's in results Test Achievement test.

And in a light, this is amazing Results, I finished the study to number from Conclusions Recommendations and

proposals that Confirms importance employment Strategies Educational Modern, no Sima Storm mental electronic, when she has from effect active in to lift level Acquisition Academic and development motivation Learning I have The female students.

#### Fatima Al-Ali (2021) <sup>[6]</sup>, titled: role Use strategy Storm mental in development skills Writing Creative I have female students Stage Basic in Jordan from Destination consideration My teacher the language Arabic.

I aimed the study to Discovery on effectiveness strategy Storm mental Developing skills Writing Creative I have female students Stage Basic in Jordan, That's from Destination consideration My teacher the language Arabic. And it has It was formed sample the study From (50) female teachers from teachers the language Arabic in schools Directorate Education Education For the brigade The desert Northern Western. And it was adopted. the study Curriculum Descriptive, where Developed questionnaire Components From (26) paragraphs, Distributed on four Fields Present It is: fluency, And authenticity, And flexibility, And the expansion ( the increase (

And showed Results that strategy Storm mental role active in development skills Writing Creative I have Female students, as She showed non presence Differences The indication Statistics in bearings teachers It is attributed variable qualification Scientific in all The fields. And in a light This is amazing Results, Recommended the study Necessity inclusion guide teacher the language Arabic Models Modern from Strategies Teaching, with clarification mechanisms Employing it In what Contributes in development Skills Linguistic The different ones, as She called to procedure More from Studies around effectiveness Strategies Modern in teaching the language Arabic.

### Part Three: Practical Aspect

#### First: Methodology Search and its procedures

**Methodology Research:** Applied On the approach Experimental Due to For its suitability nature the study, so It aims to measurement effect variable independent It is in strategy Storm mental on variable continued he Acquisition Academic and It was completed employment design experimental existing on Two groups: experimental and a female officer with application a test tribal and another After me to measure effect Treatment Experimental.

**Design Search:** Follows Search Design Experimental That Adjustment Partial, and it is possible Explanation In the form The following :

Table 1: Design Experimental

The group	Pre-test	independent variable	Test The post
empiricism	Pre-test achievement test	brainstorming strategy	Post-test achievement
The officer	Pre-test achievement test	The traditional way	Post-test achievement

**Community Search:** It consists of community this Search from all students the line the first average In schools Preparatory Government affiliated to Directorate Education in Baghdad / Al-Karkh Second in Republic Iraq For the year Academic present, where It was completed to choose This is amazing Directorate As a society For study Due to For the largest numbers Her students And diversity Their levels Educational That's Allows For research representation Suitable when He faces students Stage Intermediate in Iraq

from Challenges Educational and academy in material Chemistry.

**Sample Search:** It was completed to choose sample from students Preparatory Victory Preparatory For boys affiliated to Directorate Education in Baghdad / Al-Karkh Second, And It was completed Dividing it to Two groups: (Prince, 2004, 43) <sup>[17]</sup>.

1. **The Group Experimental:** Includes (30) students from the line the first average They are studying Chemistry Using strategy Storm Mental.
2. **The Group the Unit:** includes (30) students from same the line and the school They are studying Chemistry In the way Traditional (normal)

And it was completed to choose size Sample And its division building on style compatibility in the line Academic same to ensure balance Properties between the two groups from where the age and the collection the previous and quality Teaching, Which Contributes in accuracy comparison Results Analysis Differences Statistics between the two groups.

**Procedures Equivalence between the two groups:** To ensure accuracy Results, a job researcher on investigation Equivalence statistician between My collection Search in Variables that may Affect in safety Design Experimental It included :

#### **The Age Time: Calculated by month**

- **Acquisition Academic Previous:** Grades material the sciences for the year the previous.
- **Grades Test The tribe:** to know Information Previous in material Chemistry.

It was completed Use Test two -sample t - test Independent To make sure from non-presence Differences The indication Statistics between the two groups in This is amazing Variables.

#### **Second: Tools Search**

It was represented tool Search Main in Test Achievement test, and it was completed His building according to Steps Scientific the following :

1. **To Set the goal from Test:** Measurement collection students the line the first average in material Chemistry For topics the scheduled during period the experiment.
2. **To Set Material Scientific:** It was to set Chapters (or units) of book Chemistry For the class the first average The course Teaching it during a period The experiment.
3. **Drafting Goals Behavioral:** was analysis content Material Specific to Goals behaviorism especially, and distributed on Levels cognitive the six theory Bloom (remember, to understand, application, analysis, installation, Calendar) and it was completed an offer existing Goals on group from arbitrators to make sure from Validity And its comprehensiveness.
4. **Building Table Specifications (Test):** Completed building table specifications to ensure sincerity content Test And its comprehensiveness for the material Study and goals Behavioral and defines this Table weight all topic Study weight all level from levels Goals, and from then to set number Questions Test in all topic and level My knowledge.
5. **Drafting paragraphs the Test:** in a light table Specifications, It was completed Drafting number from Paragraphs Objectivity (choice) from Multiple paragraphs Article Specific.

#### **Sincerity The Test**

**Sincerity Content:** Done Confirmation from during following steps table Specifications.

**Sincerity the Arbitrators:** have been an offer Test in His picture Primary on group from arbitrators Experts in area Curricula And methods teaching the sciences and measurement And the calendar, To show Opinion in bezel acting Paragraphs For the purposes, And its clarity, And her safety Scientific and linguistic And it was amendment or delete Paragraphs that Collect Judges on non Its validity, And keeping on Paragraphs that I was fortunate With the approval of (80%) or more.

#### **The App Exploratory for Testing**

**Goal:** Calculation Properties psychometrics for testing (difficulty), Discrimination and effectiveness Alternatives (incorrect) and confirmation from clarity His instructions and extent suitable the time.

**Sample exploratory First:** Dish Test on sample exploratory Its composition is (30) students from outside sample Search Main, That's To calculate coefficient Steadfastness and time The answer.

**Sample exploratory Second:** Dish on sample other student to calculate Transactions Difficulty and discrimination and effectiveness Alternatives.

#### **Analysis Paragraphs the Test:**

- **Coefficient Difficulty:** Completed account coefficient Difficulty per paragraph, and they ranged Its value Between (0.30 – 0.80), It is rate Acceptable Educationally speaking.
- **Coefficient Discrimination:** It was account coefficient Discrimination per paragraph, and it was all Values Paragraphs Acceptable (larger) (From 0.20)
- **Effectiveness Alternatives Incorrect:** It was Confirmation from that all Alternatives wrong paragraphs choice from multi may Attracted To her Number from students in the group The world more from the group The highest.
- **Stability Test:** Completed account stability Test In a way Retail Halfway, where It was completed revision Test then account coefficient Pearson correlation between grades half Test the first and the second, then It was completed amendment coefficient Steadfastness Using equation Spearman - Brown, and reached coefficient The stability (0.85) is coefficient stability high and acceptable for purposes Search. (Al-Khalidi, 2015, 76)<sup>[2]</sup>
- **Formula Final for testing:** after procedure practical Analysis statistician paragraphs Test exploratory, exclusion Paragraphs not The righteous one, and modification what Needs to amendment, become Test in His picture Final Ready For the application be Test ( 30) paragraphs from type choice from Multiple, And Be mindful in distribution This is amazing Paragraphs that Cover levels Bloom cognitive The six ( remember, to understand, application, analysis, installation, Calendar (according to) table Specifications that It was completed Prepared by pre And it was to set Time Suitable To answer In (45 minutes), He is the time absorbed from before majority students in Sample Exploratory.

**Table 2:** Distribution Paragraphs

Bloom's level	Number of paragraphs	Paragraph ratio	The purpose of measurement
memory	8	26.5%	Measuring the student's ability to memorize and recall basic terms and laws.
Understanding	10	33.5%	Measuring the student's ability to interpret phenomena and reformulate concepts in his own words.
			Measuring the student's ability to use laws to solve new problems or interpret life situations.
The app	6	20%	Measuring the student's ability to distinguish relationships between parts and to deduce errors.
Analysis	3	10%	Measuring the student's ability to propose hypotheses or design simple experiments
			Measuring the student's ability to make judgments about ideas or results while expressing a reasoned opinion.
total	30		100%

### Third: Procedures Application Search (Steps Implementation)

- Test the tribe:** It was completed application Test Achievement Tribal on My collection Experimental research and the officer) in time one, that's before Start Implementation The experience, to make sure from equivalent the two groups and to calculate Acquisition Tribal.
- Teaching the group the officer:** He did teacher Material teaching the group The officer according to the method The usual (traditional) practice in School (lecture, to explain, Questions (And answers)
- Teaching the group experimental:** He teacher same teaching the group empiricism according to strategy Storm mental, with Commitment With her steps as he Explained in framework Theoretical :
  - Session Storm Mental:** begins Lesson By specifying the problem or the topic Main For the lesson, and he put it down on appearance a question open.
  - Generation Ideas:** Request teacher from students Presentation greater amount maybe from Ideas around the topic, with Commitment Principles Storm Mental) postponement) Criticism, freedom the proposal, Construction on ideas Others, Quantity then the way). It is done registration all Ideas on the blackboard.

- Phase Evaluation and the classification:** after Depletion ideas Students, He moves teacher with them to phase evaluation Ideas The proposed, and its classification, and discussion Her health Scientific, and link it Conceptually Chemical Required in the lesson.

- Link by methodology:** Teacher in summary Ideas Correct And link it with the material Scientific The scheduled in the book School, to ensure investigation Goals Educational For the lesson.
- Test Postural:** after Finish from teaching Material Specific (which It took 4 weeks. It was completed application Test Achievement the post on my collection Experimental research and the officer) in time one and circumstances Similar.
- Revision Test:** Completed revision papers Answers students from before researcher, And monitored Grades per student Introduction To analyze it Statistically.

### Fourth: Presentation Results And its interpretation

**Results Related by testing the hypothesis:** It was collection grades students in Test Achievement The next, and account average Calculation and deviation Standard per group, then Use Test two -sample t - test Independent For comparison between Mediterranean grades The two groups. And she explains Results in Table The following :

**Table 3:** A test two -sample t - test Independent For comparison between Mediterranean grades the two groups

The group	Number of students	arithmetic mean	deviation Standard	degree Freedom	Calculated value of ( t )	tabulated value of ( t )	Significance Statistics At (0.05)
Empiricism	30	85.6	8.2	58	4.25	2.00	Function statistically
The officer	30	76.4	7.9				

It is clear from Table that The calculated value of ( t ) is (4.25) greater from The tabulated value of ( t ) is (2.00) at level Significance (0.05) and degree Freedom (58) and this Meaning presence difference This indication Statistics between Mediterranean grades The two groups In favor of The group experimental and indicates that to superiority students The group empiricism Those They studied material Chemistry With strategy Storm mental on students The group The officer Those They studied In the way The usual in Test Achievement The next step.

Building on this is amazing the result, it is acceptance Hypothesis The alternative that it states on presence difference This indication Statistics in favor of the group experimental.

### Discussion Results: In a light framework Theory and studies Previous :

- Attributed superiority the group empiricism to nature strategy Storm mental that Stimulated thinking Active I have Students, and made them axis The process Educational Which led to to understand Deeper For concepts Chemical Not merely Save it.
- Contributed environment Freedom Intellectual and postponement Criticism in to encourage students on Presentation Their ideas Don fear, Which Increase from Their trust themselves Their interest with the material.
- It allowed strategy an opportunity to learn Cooperative And the building on ideas Others, Which Help in Consolidation Information And link it Some of them Some In a way better.

4. Use Storm mental make a class Chemistry more suspense and interactive, Which Increase from motivation students to learn, therefore mirror that Positively on Their acquisition.
5. Agree this is amazing Results with study victory Khayro (2021) <sup>[21]</sup> which Showed superiority The group empiricism that Used Storm mental electronic, And with study Fatima Al-Ali (2021) <sup>[6]</sup> which Confirmed role strategy in development skills thinking Creative Which Reflected on Collection.

#### Fifth: Conclusions

In a light Results that It was completed Reaching To her, conclude researcher what Next :

1. Strategy Storm mental effectiveness clear in to lift Acquisition Academic For students the line the first average in material Chemistry comparison in the way the usual way.
2. Contributes strategy Storm mental in to improve to understand students for concepts Chemical from during Involve them in practical generation Ideas And discuss it.
3. Create strategy environment Safia Interactive motivating on thinking and creativity, Which He increases from motivation students about Learning.

#### Sixth: Recommendations

In a light results Research, Recommend researcher In what Next :

1. **For teachers:** A necessity training My teacher material Chemistry on How to employment strategy Storm mental in Teaching them, from during Courses Training Workshops a job Specialized.
2. **For supervisors Educators:** Encouragement teachers on Use Strategies teaching Modern interactive Like a storm mental, and follow Applying it in a way correct inside the room the classroom.
3. **For developers Curricula:** Inclusion Activities Educational existing on strategy Storm mental in books Chemistry for the stage Middle school, providing instructions for the teacher around How to Implement it.

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