

## Psychological Impact of Filtering Ideas Strategy on Achievement in Biology for Fourth Secondary Class Pupils / Scientific division

Imad Mohammed Ayoob Al-Salami<sup>1</sup>, Amal Fatah Zedan Al-Abayachi<sup>2</sup>, Shifaa Mahdi Salih<sup>3</sup>

imad.21esp59@student.uomosul.edu.iq<sup>1</sup>

<sup>1,2,3</sup>College of Education for Pure Sciences / University of Mosul

Received: 13-April-2023

Revised: 08-May-2023

Accepted: 10-June-2023

### ABSTRACT

The aim of the Current research is to shed Lights on impact of Pupils filtering ideas strategy on achievement of 4th secondary class" scientific division in biology. The researcher puta null hypothes, that propose (there is no statistically significant difference at (0.05) level between the means of grades. of 4th Pupil secondary Class scientific division for experimental and Control groups on achievement test). Researcher adopted empirical approach of partially Controlled to Control variables. Society was 4<sup>th</sup> secondary class pupils /scientific division Consisting from 68 The researcher took his sample randomly from (Amir bin Abdullah secondary school), the sample was (47) pupils divided into (22) pupils in experimental group using filtering ideas strategy and (25) in Control group using traditional method. The researcher equated both groups in (parents academic achievement, age in measured months, and last year achievement in biology for the pupil). variables. Equation was statistically approved. In order to apply this research, certain tools needed to be prepared behavioral goals teaching plans, and achievement test, when the experiment was over researcher applied tools on research. groups, graded pupils' answer attained data of both groups. Data were statistically treated using (t-test, for two independent samples. The results showed superior of experimental group that used strategy of filtering ideas over Control group that used traditional method regarding academia achievement.

**Keywords-** Psychological, Biology, Scientific division, pupils

### Introduction:

#### First: Research problem:

We live in a world that witnesses on a daily basis rapid development in scientific and technological fields. No day passes. without hearing about a new. discovery, invention or improvement of a known industry globally. To keep up this unprecedented development, educators, politicians, society leaders and parents face unprecedented questions of how to prepare today pupils for challenges of tomorrow, that require new trends in methodologies. Traditional ways are not enough, increase in data, and different knowledge resources make person unable to Control but a small portion. Thus, aim of educational process is not restricted in Providing pupils with facts and knowledge but to develop their thinking abilities attitudes and trends towards pedagogical material, to enable them to handle rapidly increasing information in a good way. Such a trend require developing all elements of educational system, to modernize then and qualify them to meet the needs of such variables. Many Pedagogical parties Called to adopt new trends in methodologies to help pupils to enhance their learning and thinking through adopting strategies and methodologies that are pupil-oriented, providing meaningful learning opportunities via various activities (Swaidan and Al-Zuhairi, 2018)

Al-Zarkani (2018) states that traditional methodologies used by teachers don't fulfil the basic needs of learners, where pupil is only listener. and reciever without any reaction with Content. Pupils don't have enough time to think, look, discover, generate ideas or solutions as well as not using knowledge to solve Problems through applying knowledge in new situations enable him to give proposals to solve problems (Al-Zarkani2018).

As far, as searcher knows from his teachers in methodologies and his own ideas as an M.A. Candidate, researcher feels the need to use modern methodologies to keep up with scientific and technological development of our time. After Corresponding with related parties (see appendix 1), researcher made a survey for a sample of biology teachers of 4<sup>th</sup> secondary class /scientific division about modern methodologies (such as this suggested

strategy) (appendix 2). Teachers must have no less than (4) years in teaching. Sample was (30) teachers distributed in (20) schools (appendix 3). After reviewing their answers it was found that.

60% of teachers have no idea about modern methodologies.

90%. of teachers have no idea about filtering ideas strategy.

Thus, research problem Can be shaped through answering this question (What is the impact of filtering ideas strategy on achievement of 4<sup>th</sup> secondary class pupils/scientific division in biology?)

21th Century witnessed rapid and Consequent changes in all walks of life. This time obligates each person to know issues and problems of his society and how to deal with them in real life. What every individual seeks is how to be a good effective citizen with a positive effect on society, to help in developing his society and solve its problems. Social responsibility of pupils is an important issue needs to be developed and embodied via practice, to Connect learning with life and Conditions that faces them so that pupils Can over come them.

Teaching has no fixed molds. Teacher is required to react with his environment face problems, balance his abilities and work. This calls for changes in teaching and everlasting training to improve his Career abilities and mind potentials Raising his teaching performance is a goal of pedagogical process in any Country (developed or developing) as their ability to develop minds of their citizens and utilize them to become able to react Constructively and positively with uptodate challenges in away that serves their development goals. All of the above mentioned fact reflected on development of any society because it is a Core source of human development and a key factor to increase production in quality and quantity. (Dorah, 1991, p 13).

School is a pillar of education. It shapes future of pupils more than any other social facility School is the result of Contribution in a society guided by teacher so that pupils are thinkers and mediators (Lipman, 1998, 15).

Curriculum is all educational and learning experiences that school provide for pupils within or outside walls of school to develop their personalities In all sides in accordance with pedagogical goals. Thus, Curriculum includes all activities performed by pupils supervised by teachers (Handam and Jabir, 1992, 13).

Modern Concept of teaching uses wide range of teaching strategies that enable pupils to reach knowledge by themselves. This can be done by using strategies make them responsible for their learning. That is why, we witnessed attention in learning and teaching strategies as well as their effective role to enhance learning environment to reach educational outputs meet the needs of today (Al-Hashimi & Al- Dolaimi, 2008, 29).

AL- Saidi (2016). says that strategies of learning and teaching has major role. to enhance learning environment, reach educational results Coincide with our time and fulfill ambitions of learners and teachers. Teaching strategy is a group of methods and ways used in teaching-learning situations that contain principles, rules, integrated styles guide teacher in his pursuit to organize classroom learning. They enroll learners in doing things that motivate their thinking, to use upper thinking jobs based on analysis building, and Construction of what they learn Classroom teaching skills Can be used in totally new situations, Help pupils to handle the big amount of piled information Learning to happen requires ability to retain acquired information. Information, however that Can't be remembered is not worth when dealing with learning requirement inside or outside school. (Al-Saidi, 2016, 185).

Biology teachers must incorporate modern strategies because this would shift pupils' rules from negative to positive, looking for information, as well as a producer. Modern methodologies and strategies help excite pupils, Catch their attention to build productive, thinker and information seeker personality simultaneously (Daamas, 2009:21).

Given all what is mentioned above, light is focused on using learning on using strategies that make pupil as Center of learning process, to deliver Positive, active pupil during learning process, to set the stage for the pupil to discover information by himself rather than having it ready-made Role of. teacher shifts from giver and reciever of information to a mentor in search for information and knowledge to see his prescribed materials In a new light (Qurani, 2011, 1).

Strategy Is an educational goal, moves made and organized by teacher to follow while teaching his pupils (Mohammad & Mohammad 2014,47).

Attiah (2008) points out that realizing learning process in all its sides attached to the strategy used including methodologies, motivating pupils. Strategy make learning pupil-oriented. Teacher must Consider pupils preparations and attitudes to achieve desired goals (Attiah, 2008, 30).

One of these strategies is filtering ideas, an active learning strategy based on bringing to surface of mind all ideas about certain subject. It motivate pupils to reach a solution. It is based on giving students different ideas about discussed scientific phenomenon so that pupils will sift and filter these ideas to reach limited ones that Can be used. The strategy aims at developing pupils' abilities to filter Primary ideas to them according to certain pre-set standards (Amba Suedi et al, 2016, 59).

Success in teaching Science in general and biology in particular depends on efficiency of teacher and his potentials. Teaching is essence of educational process. Thus efficiency of educational system depends on teachers. We all agree that teachers lead humanity, make difference and change. Quality of teacher in general and biology teachers in particular increases with the explosion of scientific and technological knowledge with complexity of economic social and cultural life. Science teacher is a key player in facing requirements of 21<sup>st</sup> Century, Cornerstone in practical education. Best-curricula and Courses can't achieve desired goals without a well-equipped science teacher changing these Curricula into reality in behavior of pupil, the goal of education, base and aim of development (Al-Wahabah, 2013, 3).

Focus shifted in teaching science from memorizing laws and facts to use science in practical life. Given this perspective, method and Content are twins. The method you study facts and facts you study go hand in hand. Attention is focused on Content and method as basis of teaching sciences nowadays. That's why goals of teaching sciences to Coincide with these facts (Nashwan 1992.68).

Science takes a special place among Curriculum. Studying biology is one of of the fields that greatly affect our lives due to its wide applications in all walks of life (Tamimi, 2018, 1).

It's highly related and with direct contact with life of learner and his environment due to. its incorporated principles and Concepts that define relation of learner with his environment (Al-Khafaji 2016, 602).

Specialized in education focus on achievement duet. its huge impact on Pedagogical life of learner. Achievement is the result of what happens in educational facility of different and various learning processes for various knowledge and skills of science that indicate learner's mind and Cognitive activity. Achievement means that an individual gets highest level of knowledge or information in all his Consequent stages of his life from childhood to elderly. Achievement trans from current stage to the next and So on (Al-Jalali, 2011, 21).

#### **Importance of research is summarized in:**

- 1- Necessity of using Modern strategies to cause quality of teaching biology that depends on mental share of pupils, to mention but few, filtering ideas strategy.
- 2- Importance of achievement, a key variable in realizing educational goals and their importance in academic life of pupil.

#### **Second: Aim of Research: Aim of Current research is:**

Impact of filtering ideas strategy on achievement of 4<sup>th</sup> secondary class pupils/Scientific division in biology.

#### **Third: hypothesis, To achieve goals of research, researcher made, the following null hypothesis:**

There is no statistically significant difference at (0.05) level between. the means of 4<sup>th</sup> secondary class pupils/scientific division for the groups (experimental and Control) in achievement test.

#### **Fourth: Limits: Current research is limited to:**

- 1- 4<sup>th</sup> secondary class pupils / scientific division registered in main stream secondary schools of state administrate of education of Nineveh governorate (left and right banks) / first semester of academic year 2022/2023.
- 2- 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> chapters of Prescribed biology Curriculum for scientific division, 11<sup>th</sup> edition for the year 2021.

#### **Fifth: Terminology identification: Researcher will identify the following terminologies:**

**First: Effects** Defined by Al-Saadoon (2012) as: amount of intended change independent variable by the effect of independent variable (Al-Saadoon,2012: 122).

**Procedural definition:** amount of change on pupils' grades when teaching biology for experimental group according to independent variable (filtering ideas strategy) in achievement test.

**Second: Strategy:** Defined by (kammash 2018): a group of decisions made by teacher and reflected in patterns of deeds performed by teacher and learners in educational situation, relation between educational goals and Chosen strategy is chosen as the best way to realize goals (kammash, 2018: 128).

Procedural definition a group of steps Committed by teacher (researcher) during lesson to illaborate delivering idea to students far away from traditional method in teaching biology for 4<sup>th</sup> secondary class pupils scientific division and following filtering ideas strategy.

**Third: Filtering ideas strategy:** Defined by:

1- Ambo Saeedi et al (2016): strategy based on giving pupils different ideas about the studied scientific phenomenon through brain storm then filtering ideas according to Certain standards or limits already set by teacher (Ambo Saeedi et al, 2016: 58)

2- AL-Zurkani (2018): an active learning strategy include number of procedures made by teacher and learner based on roles for both to interact with prescribed material (Al-Zurkani, 2018, 76).

3- Al-Bahadli (2020): Motivate pupils' minds by following certain methods to give a number of different various ideas about Certain subject, then classify filter and study these ideas according to prescribed standards and supervised by teacher (Al-Bahadli, 2020, 16).

Procedural definition: An active learning strategy used to teach biology for 4<sup>th</sup> secondary Class pupils/scientific division represented in steps followed by researcher during lesson (i.e. teaching plan made by researcher).

Fourth: Achievement: Defined by Fakhri (2018) as: the output of pupils from educational process such as (knowledge, information, skills attitudes, and abilities due to his effort while learning at school, or home tutoring and it can be measured through regular tests at the end of academic year.

Procedural definition: amount of information facts and Concepts groups gained by research. (experimental and Control) in achievement test made by researcher after teaching (2,3,4,5,) chapters of biology for 4<sup>th</sup> secondary class pupils scientific division using filtering ideas strategy (i.e. grade of pupil in test).

### **Theoretical Framework:**

#### **Constructive Theory and Active learning:**

It's with no doubt that active learning is the other side of Constructive theory due to learning depends on active environment on Constructive introduction represented in making learner build his own learning Through interaction with variables and elements. This is how his knowledge is built expanding his knowledge environment. In other words learning process depends on activity of learner, his positive. reaction with teaching situations. Knowledge is built by learner through mental activity and doesn't come from outside. Learner make knowledge meaningful in his Cognitive Construction, relates old to new like discovering on Links and relation between his old and new information, strengthen the Link between active learning and Constructive theory assisting on previous knowledge of learner and activate it as the basis to build knowledge upon. Active learning represented by motivating him throng previous knowledge, retain and activate it to join old with new and make new learning meaningful for him (Attan h 2018, 35).

Philosophy of active learning derived from Constructive theory as learner build his knowledge through direct reaction with the material to be learnt Link it with this previous Concepts, change when needed leading to create renewed knowledge, forcifying his discussions with his teacher, beside, active learning make learners responsible to build their own ways of learning. They begin in a disciplined, self-organized way, with the ability to know their goals, evaluate efficiency of their achievement, show persistence and interest to Complete learning tasks executed one at a time (Wahba, 2002:34).

Researcher thinks that active learning is the other face of constructivity because active learning is in every where in learning process from curriculum till evaluation, precisely, learner turns from receiver to participant in giving ideas about pedagogical issue.

One can argue that active learning isn't new. learning by itself is an active process. However active learning as a method or system got increasing amount of interest with development of learning theories. Famous educators

affirmed that. John Dewey adopted learning through work While Piaget affirmed necessity of tangible processes during early childhood (Awad & Zamil: 2010, 20-21).

Curriculum and methodologies expert say that active learning is a new trend that give positive role for learner in learning. Pupil will have chance to solve problems, make decisions and practice all types of thinking in addition to acquire a number of mental, information and emotional skills. Active learning focuses on learning processes more than learning results, affirms positivity of pupil in learning situation through pupil's practice of many individual and collective activities that provide elements of active learning: having fun, talk, read, write and mediate. It includes all educational practices and procedures that seek to actuate and magnify role of pupil through work experiments and research. Active learning importance lies in the view for the pupil as the latter is responsible for discovering building, Create something new. Teacher is seen as a source and facilitator. Active learning includes many strategies allowing student

to talk, read, write and reflect upon content as well as many practices like solving problems, be with in a group, Case study, practical and

applicable practices in addition to various activities that require pupil to reflect on everything he learns and apply it (Qurni, 2013: 26-27)

**Following is a table explains role of pupil in active learning vs. traditional learning (Figure 1):**

Role of Pupil in Active learning.	Role of Pupil in Control Learning.
learner spare no effort to be active and participate in learning process	Wait instructions from teacher as a receiver
Learner tries his best to have an active part and participate in all learning processes	Writes all that he is told to write memorize the rest and do as required
Finds relations between information that he learns and look for internal relations	not interested to know relations within and deal with them as deconstructed data
Evaluate what pupil learnt and how to apply it practically	his interest and thinking doesn't exceed what he studies , memorize and retain for success in tests
retains what he learnt easily, busy in teaching process with all his heart	feels bored, lazy, forgetfulness and becomes absent minded.
apply what he learnt in daily life situations	doesn't Care to apply what he learnt and use it in life situations

**Figure (1) balance between roles of pupil in traditional and active learning (Attia, 2018, 60).**

Strategies of Active learning. It is an effective methods and styles based on Positivity of pupils and motivate them to think about what they learn and acquire of knowledge, information actively and efficiently to help them to be more active about developing skills that help them adapt with updates inventions, do activities, thinking processes, exclude ideas, show them explain different view points. All that help to give them various educational skills, Create integrated personality develop upper thinking skills (National Center for educational research and development, 2010: 2)

Human, whatever his position was, is obliged to be speed, accurate, raise performance level to manage time efficiently. He must change many behavior patterns at work, school, education and learning. Besides he is obliged to create quality ideas, response to challenges and updates that face him with in change requirements that he suffers daily (Al-Hashim & Al-Dolaim 2008, 147).

Using learning strategies became an important variable in active learning. Learning strategies are behaviors and ideas affect his motive emotional state through acquiring, selecting and organizing new knowledge. By using many learning strategies, individuals can influence form and quality of Knowledge acquired. Active learning strategies are those educational practices followed by teacher inside classroom and depends heavily on activity, efficiency and positivity of children, take responsibility of their learning, ability to take decision about learning,

encouraging Cooperative working to support their self and social intelligences (Al-Hashimi & Al-Dolaini 2008:148).

These strategies include many activities like enroll pupils in classroom discussions.

- Thinking and individual writing training
- Double systems (like thinking and Participation activities)
- Interactive sessions.

**Active learning strategies include:**

1. Hot seat strategy
2. Paper strategy per minute
3. Fish bone strategy
4. Fish Bowl strategy
5. Role-play strategy
6. Discussion method
7. Educational game
8. Solving problems strategy
9. Brain storming strategy

**10. Filtering idea strategy:** depends on pupils give different ideas about the suggested phenomenon through brain storming. Then sift and filtering ideas they give according to certain standards set by teacher to reach certain ideas that Can be used and applied in suggested skill. This strategy encourages pupils to let all ideas out , depend on free thinking used to create ideas to handle certain subject or problem. It aims at developing pupils abilities to eliminate primal ideas to adjust then on Certain pre-set standards. Usually this strategy used in introducing lesson, but teacher may use it at the end to Catch his pupils attention to raise their motive toward the lesson (Ambo Saeedi, 2016:58).

Strategy seeks to increase pupils abilities to sift and filter given ideas to evaluate ideas according to pre-set standards. Requirements of execution are A3 or A4 type of papers (Ambo Saeedi, and Huda 2016:58).

**Characters of Filtering ideas strategy:**

1. Encourages activity, reaction and Cooperation among pupils.
2. To create ideas, develop thinking, understanding, filter and retain ideas.
3. Develop self-confidence for pupils, express opinions, respect that of others and take decision.
4. Kill fear hesitations, worryness, shy, introvert and non-participation for pupils.
5. Low cost, doesn't need devices or equipment that burden teacher.
- 6-Execution time coincides with class time.
7. Contains most important styles: brain storming and Cooperative learning (Al Zarkani 2018.772).

Badeer (2018) says that teacher's role in active learning strategy changes into guide, facilitator, direct and helper of pupil in need. Role of teacher in filtering ideas strategy is:

1. Organize learning environment.
2. Design lessons and activities.
3. Provide learning sources and tools.
4. Manage lesson in a smart way directed to realize set goals.
5. Mind individual differences among pupils.
6. Activate pupils positivity in learning processes Process.
7. Provide discussion opportunities between to Pupils in learning process. (Badeer, 2018, 244-233).

Attiah (2018) says that pupil plays many roles in filtering ideas strategy:

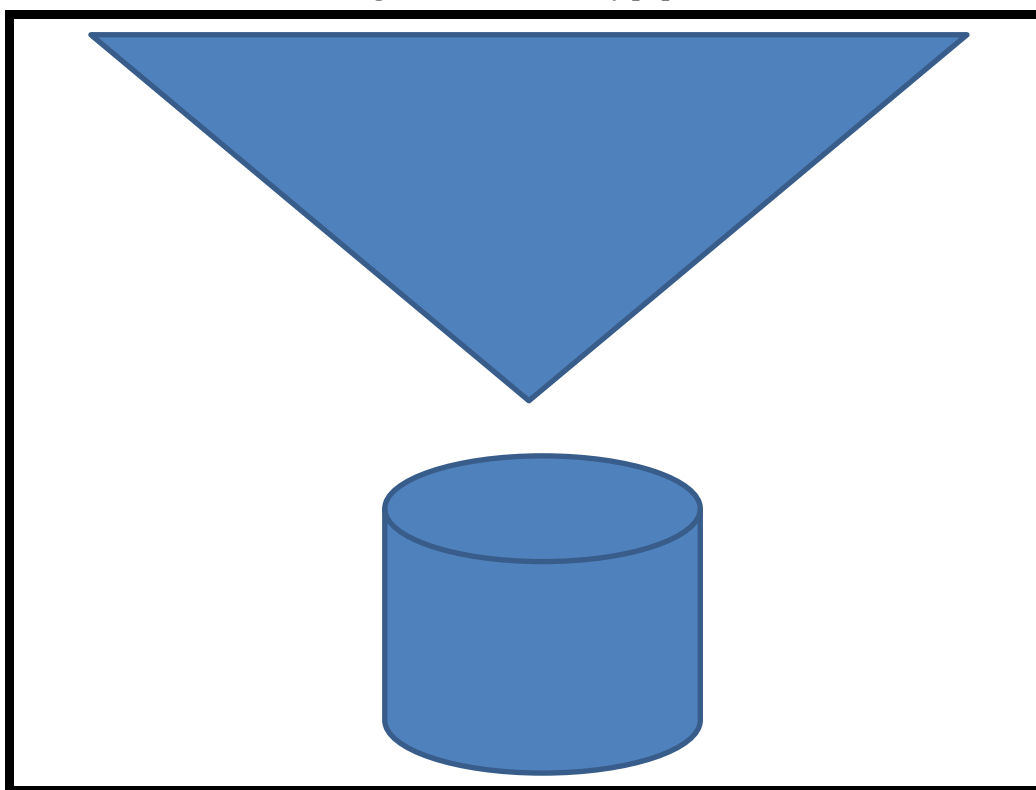
1. Participate actively in learning process.
2. Help with his peers and answers explanation

3. Concludes, summarizes and writes summarizes.
4. Look in sources of learning, information and all that is new.
5. Read, investigate seeks to realize lesson goals depending on himself and peer reaction.
6. Evaluate himself and analyse and criticise ideas. (Attah, 2018 ,43).

#### **Steps of Executing Filtering Ideas Strategy:**

1. Teacher prepares brain-storming question to do brain-storming process to extract related ideas.
2. Teacher asks pupils to make cooperative groups, give them A3 paper and ask them to draw con with glass or paper as in the following.

**Figure (1) con drawn by pupil**



**Figure (1): Con with glass drawn by pupils according to request of researcher (prepared by researcher)**

3. Asks pupils to put agreed ideas from brain storming process in upper part of Con, then brain starring the given question.
4. After that, teacher asks pupils to sift these ideas according to preset standards and put them in lower part of Con.
5. Pupils discuss their primal ideas and filtered ideas (Ambo Saedi & Huda, 2016:58).

#### **Literature Review:**

1. **Mohammed (2019):** Study aimed at Knowing (effect of filtering ideas strategy on achievement and increase mental motivation for 5<sup>th</sup> secondary class female pupils/literary division in history). Study took place in Iraq/ Diyala University/ College of basic education. To achieve this goal, researcher adopted experimental design of partially Control two groups (Control and experimental) pre-post tests . Sample was(66) students (32) in experimental group and (34) in Control group. Researcher equated both groups in (academic achievement of parents, first semester grades of academic year 2017-2018, IQ tests, pre-test of scale of mental motivation). Researcher used (SPSS) to analyse and handle data statistically. Results showed surpass of experimental group who used filtering ideas strategy over Control group in achievement and mental motivation.

2. **Al-Bahadli (2020):** Aim was to know (effects of clustering and filtering ideas strategies on achievement in geography and develop interactive thinking for 4<sup>th</sup> secondary class pupils / Literary division). Study took place in Iraq/Baghdad University/College of education (Ibn Rushd) To achieve such goal, researcher adopted experimental design of partial Control for both groups. Sample was (99). (33) for 1<sup>st</sup> experimental group (33) for 2<sup>nd</sup> experimental group and (33) for Control group. Researcher equated following variables (age measured in months, Intelligence level, pre-knowledge test, academic achievement of parents, pre-interactive thinking test). Researcher made achievement test and interactive thinking scale. Researcher used the following statistical methods (kai-square test, relative importance distinctive force factor, difficulty factor of items, effective false, alternatives, uni-lateral variance analysis, Pearson Conjunction factor Kronbach-Alpha equation, Spearman-Brown equation; (cooper equation). Results showed superiority of experimental group over Control (Al-Bahadli, 2020-84).

3. **Obaid (2021):** Aimed to know (effect filtering ideas strategy on acquisition of psychological concepts for 5<sup>th</sup> secondary class pupils Literary division and developing their inductive thinking). Study happened in Iraq / Tikrit university/College of education for humanities. To realize the goal, researcher adopted partially Control method with equivalent two groups (experimental and Control). Sample was (47) with (23) in Control group and (24) in experimental group. Researcher equated both groups in the following variables (intelligence, pre-test of inductive thinking academic achievement of parents, age measured in months). After treating data statistically, results showed superiority of experimental group that used filtering ideas strategy over control group that used traditional method.

**Procedures:**

**First:** Experimental design: Researcher used experimental design of partially Controlled design named (design of equivalent groups) (Cohen 2013, 213) that is appropriate for procedures of Current research. This design equivalent groups: experimental to use filtering ideas strategy and Control group that uses traditional method as shown in figure (2)

NO.	Group	Dependent variable	Post-test
1	experimental	Filtering ideas strategy	Achievement test
2	control	*****	

**Second:** Community Limits: All 4<sup>th</sup> Secondary class pupils / scientific division in mainstream schools reaching (6800) pupils for academic year (2022-2023) distributed on (38) secondary schools for boys.

**Third:** Research Samples: Researcher intentionally chose (Amir Abdullah) secondary school for boys for the following reasons:

1. School with domain of residence of researcher in left bank because researcher resides in dormitory.
2. Cooperation of school administration with researcher, give all that is needed to implement experiment groups (experimental and Control) were chosen in simple random way Class (B) was experimental group to follow suggested strategy and (A) was control group. Experimental group (22) pupils and Control group (25). No exclusion took place. Sample was (47) students as shown in table (1).

**Table (1) Number of pupils in both groups**

Group	school	Class	Division	No. of Pupils
experimental	Amir Abdullah	4 <sup>th</sup>	B	22
Control	Amir Abdullah	4 <sup>th</sup>	A	25

**Fourth:** Research groups' equation: Researcher equalized both groups (Control and experimental) statistically in a number of variables that may affect dependent variable over independent one : age measured in months, academic achievement of fathers academic achievement of mothers, equivalence in pupils' grades in biology for 3<sup>rd</sup> intermediate class. Both groups achieved equivalence.



**Fifth:** Research Requirements, To realize research procedures verify goals and hypotheses, few requirements must be prepared:

1. Choose material: Biology prescribed book for 4<sup>th</sup> secondary class pupils for academic year (2022-2023) (Chapters: 2-3-4-5).
2. Behavioral objects, Researcher formulated (157) behavioral objects within the first four levels of Bloom's classification in cognitive domain (retain, Conception, applying, analysis). Passed a panel of experts and referees in education and methodologies for validation.
3. Prepare teaching plans: Researcher made (24) plans for experimental group based on filtering ideas strategy and the same for Control group based on traditional method.

**Tool of Research:** Researcher made achievement test based on following tools:-

1. Content analysis
2. Set behavioral aims
3. Prepare test map (table of characters) as shown in table (2)

**Table (2): Table of Characters (Test Map)**

No. of Ch	% of goal % of content	Conception 34%	Understanding 36%	Apply 19%	Analysis 11%	Total 100%
Ch2	17%	3	3	2	1	9
Ch3	30%	5	5	3	2	15
Ch4	33%	5	6	3	2	16
Ch5	20%	3	4	2	1	10
Total	100%	16	18	10	6	50

**4. Forming test items:** Reviewing literature reviews, researcher farmed objective test items (multiple choice of three alternatives).

**5. Reliability:** Researcher adopted two kinds of reliability (surface and content).

6. Forming test instructions.

**7. Pilot experiment:** To verify psychometric features of achievement test (discrimination force, difficulty factor, easiness factor, efficiency of false alternatives). To check clarity of test items and instructions and to Calculate time allocated to answer, researcher applied his test on Pilot sample of (250) pupils other than basic sample on Sunday (13/11/2022)

**8. Statistical Analysis of test items:** After applying test on pilot sample Data were collected and analysed. Researcher arranged them decedently taking upper and lower (27%) to calculate psychometrie Features:

A. Difficulty of items ranged between (0.20-0.80) accepted according to standards (Abu Akil, 2017: 229)

B. Discrimination force: ranged (0,31-0,55). All items of test were approved except for (20, 24, 26, 27, 32) because their discrimination factor was less than (0.20) (Michael 2015.149)

C. Efficiency of false alternatives: Researcher made necessary calculations to find efficiency of alternatives. All of them were negative, meaning they are good and effective

**9. Stability:** Researcher used kudor-Richardson-20 equation to find stability reaching (0,827) good one. Al-Abassi (2018) says that stability is good if factor was (0,7) or more (Al-Abassi, 2018: 296). Thus, test ready to be applied on sample.

**10. Final image of test:** Final test was (45) items of objective items with (1) Correct item and others are false. Researcher graded every Correct alternative (1) and false ones (0). Thus highest grade of pupil was (45) while, least was (0).

#### Review Results:

There is no statistically significant difference at (0.05) level between the means of achievement of 4<sup>th</sup> secondary class pupils in biology scientific division between experimental group that used suggested strategy and Control group that used traditional method.

**Table (3) Mathematical means and Standard deviation, T-test value of achievement t-test**

Test	No.	Math. Means	Standard deviation	T value		Level of importance
				Calculated	Schedule	
Experimental	22	40.318	3,217	5.052	2.014	Statically significant
Control	25	35.12	3.722			

**moral at margin of (0.05), freedom degree of (45), t-schedule value = 2.014**

Table above shows that calculated t-value (5,052) bigger than schedule value (2,014) at (0.05) level at freedom degree of (45) meaning existence of statistically significant differences in post-achievement test for both groups and in favor of experimental group. Thus, null hypothesis rejected. To calculate effect of independent variable (filtering ideas strategy) in independent variable (dimensions of sustainable development) gratitude of effect equation was used to know value of gratitude of effect of achievement test as shown in table (4)

**Table(4)  
The effect size of an achievement test**

Variable	Table t-value	Calculated	Eta square	Standards			Gratitude of effect
				Small	Medium	Big	
Achievement	2.014	5.052	0.26	0.01	0.05	0.14	Big

table (4) shows that value of magnitude of effect of independent variable was (0,36) from dependent variable (achievement) big value in theory because value of effect is (0,14) due to the assumption that magnitude of effect is big if its value exceeds (0,14) (kiess, 1996).

Discussion and explaining results: Results in table (3) rejects null hypothesis meaning superiority of experimental group that used suggested method over Control group who used traditional method in achievement test. This result Coincides with that of Mohammed (2019) and Al-Tamimi (2015).

**Researcher attributes this superiority for the following reasons:**

1. Literature reviews are true about the theory that active learning strategies including the suggested one are pupil oriented , give them freedom to express their opinions, ideas without fear or hesitation (Badeer, 2012, 234). This reflects on their achievement and supremacy in biology.
2. Filtering ideas strategy took care of educational learning process via interest in teacher and pupil. Teacher as planner, debator and guide inside class according to strategy step. Pupil is receiver , Participant and a player of rules of class.
3. Filtering ideas strategy Contribute in raising upper thinking levels (analysis, construction, evaluating). This in turn developed skill of generating building and evaluating ideas. Producing ideas unfamiliar ideas characterized with fluency and flex ability , reflects on their achievement.
4. This strategy suits time phase of 4<sup>th</sup> secondary class pupils due to the ability of this age phase to think and give various ideas.
5. Teaching using this strategy may keep information in memory for longer time because pupil reached this information by himself.

Thus, will fight forgetfulness. All what the pupil learnt of information and skills was result of his effort. Thus information stays in his mind longer time.

Conclusions, suggestions and Recommendations.

**First: Conclusions:** Given the results reached, researcher Concludes

1. Filtering ideas strategy has big impact in raising achievement of 4<sup>th</sup>secondary class pupils/scientific division.
2. This strategy increased acquisition of information, knowing details of all subjects.

**Second: Recommendations:**

1. Necessity of using filtering ideas strategy by biology teachers in addition to other modern methodologies to raise academic achievement of pupils.
2. Curriculum made by Ministry of higher education and scientific research for College of basic education should contain modern teaching strategies including filtering ideas strategy.
3. Include filtering ideas strategy in methodology and Curriculum at Colleges of education.

**Thirdly: Suggestions:** As a Complement, researcher suggests the Following studies:

1. Make similar study for other academic stages and classes.
2. Make similar study with another variable such as (acquisition of Concepts).

**1. Arabic References:**

1. Abu Akeel, Ibrahim, Ibrahim (2017). School and educational measurement and evaluation. 1st ed. Darul Ayam for publishing and distribution Amman Jordan
2. Ambo Saeedi, Abdullah bin Khamees & Huda bint Ali Al-Hasania (2016). Strategies of active learning. Darul masira for publishing, printing and distribution, Amman. Jordan
3. Badeer, kareman (2018). Active learning. 3<sup>rd</sup> ed. Darul masira for publishing and distribution. Amman. Jordan
4. Badeer, Kareman (2012). Active learning. 2<sup>nd</sup> ed. Darul maseera for publishing and distribution and printing. Amman. Jordan
5. Al-Bahadli, Osama Jasim Mohammed (2020). Effect of Clustering and filtering ideas strategies on achievement in geography and development of interactive thinking for 4<sup>th</sup> secondary class pupils Literary division. Un published Ph. D. treatise. Baghdad. Iraq. University of Baghdad. College of education (Ibn Rushd) for humanities. Department of geography methodologies
6. Tamimi, Maisaa Hashim Hamid (2016). Learning processes included in activities booke for biology for upper primary stages in Palestine Quds university Palestine. (un published M.A. thesis)
7. Al-Tamimi, Wisan Najm Mohammed (2015). Efficiency of teaching according to mind maps strategy on achievement of fifth secondary class -pupils / Literary division in history of Europe. Un published MA. Thesis University of Babylon. Iraq
8. Al-Jalali, Lamaan Mostafa (2011). Academic achievement. 1<sup>st</sup> ed. Darul masira for printing, publishing and distribution. Amman, Jordan
9. Al-Khafaji, Zainab Hasan Obayed. (2016). Impact of Jigsaw" on achievement of 4<sup>th</sup> secondary class pupils/scientific division and! their attitude towards biology. Magazine of College of basic - education. Babylon university . No. 28.
10. Dora, Abdulbari (1991), training: Concept and systematic introduction into it. Messaye of teacher No. (1). Vol (32). Amman, Jordan
11. Daamas, Mustafa, Nimr (2009). Preparing and qualifying a teacher Dar Alam Al-Thakafa for publishing, distribution and printing, Amman Jordan
12. Al-Zarkani, Adnan Dalfi Salman (2018). Efficiency of filtering Ideas strategy an achievement in sociology for 4<sup>th</sup> secondary class pupils/ literary division and increasing their Creative thinking. Unpublished M. A. Thesis College of Basic education. Wasit university. Iraq.
13. Al-Saidi, Hasan Hayal (2016). Impact of directed Imagination. strategy on reading Comprehension for 5<sup>th</sup> "primary class pupils (M.A. Thesis), Yamama Bereau for printing and publishing. Baghdad
14. Al-Saadon, Zeina Abdulmohsen, (2012), Effect of learning thinking. program in solving problems solutions and achievement for primary stage pupils (un published Ph.D. treatise). College of education for pure sciences Ibn ul haitham. 15. Swaydan, Saada Hardi& Haider Abdulkareem Mohse AL Zohairi (2018). Skills of Classroom teaching and teacher role in teaching thinking and developing it. Dar ul Ibtikar for printing, publishing and distributio Amman, Jordan
16. Al-Abassi, kamil fadhil Khalil (2018). Methods of scientific research 1<sup>st</sup> ed. Dar Noon for printing and publishing Mosul. Iraq.

17. Obaid, Nawar Sabah Mohammed (2021). Impact of filtering ideas strategy on acquisition of psychological Concepts for 5<sup>th</sup> secondary pupils/literary division and developing their inductive thinking Unpublished M. A. thesis). College of education for humanities. Tikerit-university. Iraq
18. Attiah, Mohsen Ali (2018): Active learning: modern methods and strategies, Dar ul Shoruk for printing and publication. Amman Jordan
19. Altiah, Mohsen Ali (2008). Modern strategies in active teaching. Dar Safan for publishing and distribution. Amman
20. Awad, Yosuf Thiab, Majdi Ali Zamil (2010): Active learning toward an active teaching learning philosophy Dar ulmanahij for printing and distribution. Amman.
21. Al-Fakhri, Salim Abdullah Saeed (2018) Academic achievement. Academic book Center Amman. Jordan
22. Qurani, Zobaida Mohammed (2011). New attitudes of research in teaching sciences and practical education. 1<sup>st</sup> ed. Egyptian Library Egypt
23. Qurani, Zobaida Mohammed (2013). Strategies of active learning that is pupil-oriented and their applications in pedagogical situations, Ed. Egyptian Library for publishing and distribution. Cairo, Egypt.
24. Kamash, Yosuf, lazım (2018). Teaching learning strategies. theories Principles and Concepts. 1st ed. Dar Dijlah for printing and distribution Amman
25. Lipman, Mathew (1998). School and Development of thinking to trans Ibrahim Yehya Al. Shihabi, Ministry of culture, Damascus
26. Mohammed, Jwan Shaker (2019). Impact of filtering ideas Strategy on and developing motivation of mind for 5<sup>th</sup> secondary class female pupils in history. (un published M. A. thesis). College of basic education. Diyala University Iraq
27. Mohammed Dawood Mahir & Majid Mahdi Mohammed (2014) Basics in general methodologies. Lebanese institute of academic book. Beirut. Lebanon
28. National Center of educational researches and development (2010) Periodic bulletin of national Center of educational research and development. No. 17. Cairo
29. Michael, Amantius Naif (2015) psychological and educational measurement and evaluation for normal and special needs individuals. 1<sup>st</sup> ed. Dar Al-Isar Al-Ilmi for printing, publishing and distribution. Amman Jordan
30. Nashwan, Yagoub (1992). New in teaching science. 2<sup>nd</sup> ed. Dar ul furkan for printing and publication. Amman Jordan
31. Al-Hashimi, Abdulrahman Abd and Taha Ali Hussein Al-Dalaimi (2008) New strategies in methodologies. Dar ul Shoruk for printing and publishing. Amman. Jordan.
32. Hindam, Lujain Hard and Jabir Abdulharud Jabir (1992).Curriculums their bases, plans and evaluation. 10th ed. Darul Nahda Al-Arabiya
33. Al-Wahaba, Jamila Abdullah Ali (2013). Efficiency of a suggested training. program develop needed qualifications of biology teacher t. teach developed Curriculums in intermediate stage. Published Ph.D. treatise University of Umul kora College of education. Riyadh
34. Wahba, Mohammed Salih Abdul Sami (2009). Prepare suggested documentary bay in Artistic education based on active learning in College of acquisition and use of students college of quality education some skills in teaching Computers. Un published Ph.D. treatise. Department of Curriculums and methodologies / College of education /Al-Minya University Egypt.

## 2- English references

35. Cohen L. & Others (2003) Research methods in Education, 6<sup>th</sup> New
36. Kiess, H.O. (1996). Statistical Concepts of behavioural sciences .London. Sidney, Toronto, Ally and Bacon.