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The Impact of the Strategy of Cognitive Acceleration in the Collection of Thermodynamics and their Cognitive Thinking Skills for the Students of the College of Education for Pure Sciences

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Abstract: ***The present study aimed at identifying (the effect of the strategy of cognitive acceleration in the collection of physics (Thermodynamic) and the skills of their thinking above the knowledge of physics students in the College of Education for Pure Sciences. The research sample (44)(22) students of the experimental group and (22) students of the control group. The researchers formulated (158) behavioral goals within the levels of (recall, assimilation, application, analysis, composition, evaluation). According to Bloom's classification of the field of knowledge. The researchers prepared a collection test consisting of (45) thematic paragraphs of type of choice from the multiple and (5) paragraph and also prepared a test of skills thinking above the knowledge of the physics material consists of (20) paragraphs The cytometric properties of the two tests were determined after the statistical processing of the data using the Man and Tini equation for two independent samples and the alpha-cronpach equation. The two tests are not stable because they contain both objective and written paragraphs.the researchers put the two hypotheses and the results showed that there was a statistically significant difference between the two groups and for the experimental group in two variables,After the results were shown, there was a statistically significant difference between the two groups and for the experimental group in the two variables of achievement and testing of cognitive thinking skills. After their interpretation, the researchers recommend employing the effect of the cognitive acceleration strategy as a teaching model for all stages and for all subjects.***

Keywords: Strategy of cognitive acceleration, cognitive thinking skills, thermodynamics

1. Research Problem

The problem of research is that one of the most prominent features of this era is that of tremendous development in quantity and quality, as it is the age of technology and knowledge explosion in all fields of scientific and practical life, including the field of teaching physics, which has developed radically and extensively at the global level., In order to keep pace with the great development in the amount of scientific, technical, laboratory and other information. These developments in the field of knowledge and information management have directly affected the various sources of knowledge, whether scientific, technical or educational.In order for the human condition to continue naturally, it must recognize all new ways of life, especially those that are directly related to the work of that person. Therefore, every specialist must seek new in his or her field of specialization. Especially that the great scientific and technological progress requires everyone to search for new in their field of work to keep up with that progress and development. Today, we need more education and learning strategies that provide us with a wide range of educational opportunities that will help our students enrich their knowledge.

In order to move towards thinking above knowledge, and training them on creativity and the production of new and different. In this sense, the researchers found after interviewing teachers in the physics department and also their experience as teachers decrease in the level of physics,The teaching methods used by the College of Education for Pure Sciences may not adopt modern strategies and methods of teaching as well as their interest in the abilities of the students in the future to deal with the problems faced in the daily life to make them think and enable them to provide suggestions and suggestions for the development of work and the ability to plan for his future, the reasons for low achievement because of their use of traditional teaching methods make the professor the focus of the educational process, while not only the students but the listening and memorization and recall So the researchers chose the selection of a strategy that fits in with the teaching of the material and therefore can answer the following question. The impact of the strategy of accelerating knowledge in the achievement of the students of the Physics Department of Thermodynamic to develop the skills of their thinking above knowledge.

2. The Importance of Research

The increasing interest in recent times in science and scientific research as a result of confirming the aspirations of different societies in growth and progress. These societies have been quick to seek new scientific methods to find solutions to their problems. The centers of scientific research spread, And the normal person needs to think of all its different types to face its problems, this interest in science led to the emergence of a technological revolution based on scientific knowledge, and the correct use of information flowing at a rapid pace,Which has led to a sense of the impact of the knowledge of the technological applications in the daily life of the members of society, all of this puts a

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heavy burden on the educational process, which makes the requirements of the society of the twenty-first century need a teacher able to absorb the achievements of the scientific and technical revolution(Abdel Salam, 2001:13).

The educators in the scientific education emphasize that education in general and teaching science in particular is not only the transfer of scientific knowledge of the learner, but is a process that concerns the student's mental, emotional and skill development and the development of personality in its various important aspects.The method of teaching is the method of educating in the formation of the characters of the students, that is, the composition of their behavior, attitudes and values, rather than in the method of indoctrination, the university is an important institution, being a cultural, social and academic center dealing with a very important stage is the transition from the life offrom secondary to university age group is the heart of the society and its effective means of progress in all fields, and it is an important part of the society because they are the leaders of the future.The university also makes a significant contribution to building the personality of the student in the curriculum and the human relationships it provides.

In recent years, some educators have discovered the relationships between classroom education and learning theories, and ongoing developments in cognitive psychology are new ways of thinking about the neural structure of the human brain and its cognitive processes.

The continuous development of cognitive psychology is a new way of thinking about the nervous construction of the human brain and its cognitive processes in the learning process (Salti and Muhammad, 2009). The brain was so long thought to be genetically modified and programmed so that it can not be modified.Today, this idea has been changed to replace the idea that experience is the brain and there is a possibility to change the structure of the former brain because of the knowledge revolution we are currently living in the human brain and unprecedented programs and educational programs were developed to speed up the growth of the brain structure of learners through their transition to the stage of abstract thinking early, and one of the most important teaching approaches that have proved effective in classroom teaching, the strategy to accelerate the knowledge of Adi and Shayer (Adey and Shayer, 1994).

To accelerate the development of brain work, (Afana and Yousef, 2009). 241). To help learners to participate effectively in the lesson, to enhance learning, to retain material and to develop their creative skills, Piaget's cognitive acceleration strategy In the development of knowledge and on the ideas of Vygotsky in social construction, one of the effective strategies to accelerate mental development and develop the thinking abilities of the student through the transition to higher stages of thinking, and raise the level of abstract thinking in the student to fit this level With the age of his passing (Ghabari and Khaled, 2011 (97).

It also emphasizes the importance of this strategy to make the student active during learning through the implementation of many activities and laboratory experiments within the working groups, and also stresses the importance of confronting students with a real problem situation students are trying to find solutions through research and exploration,As well as the social negotiation of these solutions. The strategy of accelerating knowledge in science education is not limited to other subjects such as social and foreign languages. It is also important in raising the levels of cognitive growth, activating the work of the brain and developing of all kinds thinking.

From this, the researcher concludes that the strategies assigned to the sides of the brain, including the strategy of cognitive acceleration, play a large role in modern methods of teaching such as problem solving, exploration, exploration, laboratory and scientific activities, which contribute to the trend towards thinking.The effectiveness of teaching is measured by the level of students' achievement according to any aspect, whether cognitive, emotional, or skill. And achievement is one of the factors of mental composition, which is one of the basic concepts in the mental organization of the individual and is particularly important in the evaluation of performance, especially performance, which is linked to mental activity and is seen as a basis for which can determine the academic level of the student and the achievement.In the various forms and colors of the objectives of education because of its educational importance in the life of the learner, in the field of education is almost the achievement of the only criterion by which the progress of students in the study and transfer from one class to another, as well as their distribution in various disciplines of education (almashhadany,2010:3).

The theme of learning thinking skills was a major part of many. In 1977, those interested in education, including Feurstien, Gardner, and De Bono, gathered in Singapore for the 7th World Thinking Conference.

The theme of learning thinking skills was a major part of many. In 1977, everyone was rushed and recognized as being on the verge of understanding the inner magic of the thinking mind or thinking brain. (Alwan, 2011) (100) The skills of thinking is one of the most important goals pursued by educational institutions,Independent and committed to achieving them, so they harness all their energies to become able to deal consciously with the changing life conditions that surround them so current research gains its importance as :

1) Research is a response to the progress of scientific and technological development in the world and in all things, especially in the methods of teaching science, which developed in a manner of Teaching science has evolved tremendously.
2) Highlights strategies for stimulating the sides of the brain together, as well as focusing on many aspects in the learner, whether mental or social or educational.
3) The research comes in response to global trends that call for the need to pay attention forTeaching of modern teaching strategies that can speed up students 'thinking as one of the important and necessary outputs to be taken care of during learning
4) Developing students' abilities or skills may contribute to interpretation and problem solving in physics the use.

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5) Employ scientific knowledge to make it active and able to cope with life problems and decision-making by placing it in an effective activity.
6) The first attempt to experiment modestly in keeping with the development of methods of teaching physics to university education in Iraq (to the knowledge of the researchers) is adopted The strategy of cognitive acceleration in the teaching of physics for the undergraduate stage.
7) The results of this research may direct the attention of specialists in teaching physics to the need to pay attention to teaching students how to think.
8) Provides a test of cognitive thinking skills that helps teachers to identify the opportunities Which should be tailored to the student's ability to acquire these skills.
9) The start of researchers and graduate students to conduct similar or similar studies.

The objective of the research

The current research aims to verify the impact of the strategy of accelerating knowledge in the students of the physics department of thermodynamics and developing the skills of their thinking above knowledge. In order to verify the objective of the research, the researchers put the following two zero hypotheses, as follows:

- There was no statistically significant difference (0.05) between the average collection of the experimental and control groups of thermodynamic.
- There was no statistically significant difference (0.05) between the average development of cognitive thinking skills among students in the experimental groups and control group.

Research Limits

The research is determined by the following:
1) A sample of students from the second stage of the physics department at the Faculty of Education for Pure Sciences, Anbar University / Morning Studies.
2) The second semester of the academic year (2016-2017).
3) Lectures of the second course (thermodynemic).

Research Terms

The strategy of cognitive acceleration, defined by:

- Afana and yousif (2009) as' specific steps through which a set of activities designed and invented to help learners cope with conflicting events are used to stop the events to encourage them to reverse the processes of both thinking and explaining how this thinking occurs in the context of educational situations and events' (Afaneh and Yousef, 2009) 241
- (Razuki et al., 2015) as 'a set of organized and interactive steps,Which leads to stimulate the thinking of learners in accordance with (four steps, namely, preparation and discussion - Conflicts of knowledge - (Beyond thinking) - (Bridging) for the purpose of achieving the desired goals' (Rzouki and others, 2015 68).
- The two researchers agree with the definition of Razuki and others (2015) in the definition of strategy * and defined by the researchers procedure as a set of steps organized to help students of the second phase of physics who did not reach the abstract stage of thinking to get to early and According to the steps taken by the students of the experimental group starting with the sensory preparation, and then the cognitive conflict (the contradictions), followed by the knowledge (thinking thinking), and ending with bridging (linking what the student learns in his environment).

Achievement, defined by:-

- Bani Khalid (2012) as 'a specific level of achievement, efficiency or performance in school learning, which is measured through tests provided by the teacher to students'. (Bani Khalid, 145, 2012))
- AlSalkhi (2013) as' the extent to which the student acquires facts, and concepts, principles and theories at the stage of study or in a class or in a given course and the extent of its ability and measured by the total number of students' grades in the subjects prescribed. (Al-Salkhi, 2013 26) (*) and the two researchers know that the amount of what the students of the second stage learned from education College.
- The two groups of research (experimental and control) of information in the physics material lectures thermodynamic assessed as measured by the degree of the bitch obtained by the students in the test prepared by the researcher for this purpose.

Dexterity, defined by:

- Gruen (2002) as 'an intellectual process in which an individual uses his previous acquired knowledge and skills to respond to the requirements of an unfamiliar situation' (Jarwan 2002, 95).
- Specialy connected to the mathematical units (Kubaisi 2008, 93)
- It is also defined by the researchers as the acquired ability to enable students to perform their work or task accurately, accurately and quickly. *-Al-Kubaisi (2008) Educational level

The skills of thinking above knowledge it defined by both:

- Afon and others (2012) as 'a kind of self-talk about the processes of knowledge to solve a problem and how to implement and evaluate the results' (Afon, 2012, 193)
- (Azzam and Musab, 2013) defined as an individual's self-awareness of knowledge processes through the use of a range of skills such as planning, evaluation, monitoring, decision-making and selection of appropriate strategies' (Azzam and Musab, 2013: 588).
- The researchers define it as an awareness of student / student the second phase of the physics department with its cognitive, procedural and policing knowledge and its ability / ability to plan to develop a plan to solve a problem resulting from a physical position that provokes it leading to its integration / integration into it and seeking to solve it through his current knowledge and control the steps of his thinking as well as the evaluation of its procedures and measured by answering the answer to the paragraphs of the test of thinking above the knowledge prepared for research purposes.

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3. Theoretical Background

a) Strategic the acceleration of knowledge

Cognitive acceleration strategy depends on according to Piaget's ideas, and Vygotsky idea (Piaget and Vygotsky) in growth of mental development (' Afana, Yusuf, 2009:241) and one of the most important teaching approaches that have proved effective in classroom teaching, Cognitive acceleration strategy for Eddie weshair, where both (Michael Shayer Shire (f) Eddie Adey (f) Caroline Yates Carolyn Yates) Chelsea College of science and mathematics in London 1970 m to design a project to solve the problem of difficulty learning concepts in science called cognitive Acceleration ((CASE and means (Cognitive Acceleration though Science Education) and it considered as an introduction to the innovative education which was the result of cognitive development research of the psychologist (Piaget) and ideas (vigotski), and enter as a scientific curriculum for students aged (11-14) in a number of schools, where the He found that many scientific concepts that fit the scientific subjects in the United Kingdom requiring high mental abilities and skills of the students, because this team has and the Shire (Shayer) take the scientific approach to solve this problem.

Where they were needed to describe and measure the level of difficulty in scientific concepts (Adey 1999:4) and actually train the students on this strategy can move to higher knowledge levels, so this strategy is designed to accelerate and accelerate students thinking levels to a higher level so that they can Achieve the objectives of this approach is better, and that was the aim of the strategy of Adey , it is not important to have what students learn? But more important is how students learn? The role of the efficient teacher thinking not just learning, but in life, and so he seeks to train students to think and by asking them to think and retrieve a substance or hold a comparison, or draw the result of introductions, and through the use of teaching modules aimed at the development of thought (p 1997:3. be Hamid) (), and this has to be the teacher training on such strategies and modern teaching models that contribute to the development of students ' ability to think, so that teaching methods used by the teacher role in promoting appropriate weather for training on thinking, where the opportunity for each This strategy can contribute to studentIn collaborative learning and reflective and logical thinking through his mind as he says, and then acquires a student competition and self confidence through their use of positions that require the development of abstract thinking by their teacher and helps them.

b) Cognitive acceleration strategy labels

- Cognitive acceleration strategy launched many labels
- Accelerating science.
- Accelerate thinking.
- Cognitive model of mental growth acceleration.
- Adey and shier module

c) Teaching philosophy cognitive acceleration strategy

Teaching philosophy in this strategy substantially on the individual falls under the influence of attitudes or concepts incompatible with what is known as and in possession of the natural world in which he lives (pleasure, 2005:466) () and their results are contradictory positions setting to Outlook Students, through traffic in three phases through the steps of this strategy: phase contrast events, student research phase about contradiction, Paradox solution phase (happy, 2008:328) (), by providing new targeted activities for students , this activities are consideredas a real challenge to thinking during exercise activities remixes from their way of thinking and thus access to cognitive mental balance, and stomach as this strategy steps tutorials designed to encourage the development of thinking of sensual stage of mental development of cognitive Ultra, and includes Teaching strategy for classes: active participation of students and discussions among teacher accelerate students ' thinking skills.

The advantages of using cognitive acceleration strategy

1) Transition from abstract to concrete where concrete experiences in scouting activities, they often say that the learner learns from direct experience and learn if discovery experience himself rather than to submit to him, and that moves the learner from Perceived abstract by drawing out meanings of tactile.
2) Cognitive acceleration strategy enrich learning through the learner interaction and exchange ideas with peers, and develop effective participation, including through effective continuous communication between them, as social constructionist, Vygotsky theory advocated, which is available at cognitive acceleration strategy steps Particularly in the phase of preparation, which includes the following stages: prior experience-during the experiment after experiment.
3) Cognitive acceleration strategy emphasizes the active role of learners during a learning, where learners with many activities and laboratory experiences within working groups.
4) Cognitive acceleration strategy student motivation and orientation and evoke student interest and motivate them to work.
5) Allow cognitive acceleration strategy in collaboration and collective action on a democratic basis and take into account differences between individual learners in their ability to learn.
6) Cognitive acceleration strategy is based on positive activity by learners.
7) Cognitive acceleration strategy emphasizes the importance of addressing a real problem trying to position learners find solutions through research and prospecting through social bargaining for these solutions, and this is what is available in Vygotsky's theory that set the stage for the emergence of cognitive acceleration strategy.
8) The cognitive acceleration strategy works on previous idea and urged the learner to understand is not in harmony with the brain, and thus be a learner capable of changing his ideas and concepts or reorganizing the structure of his brain in regards with the construction of knowledge stored in long term memory, learner awareness in his thinking and rethinkingIn his mind from time to time helps him to develop and grow a brain and improve abilities, thus integrating its ideas, management and evaluation and follow up during the learning process. (Rzouki and others, 2015:73-74).

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4. Cognitive Acceleration Strategy Goals

(Rzouki and others, 2015) explained the goals of using cognitive acceleration strategy will:

1) Planning the tasks her learners to learn how they think to develop cognitive abilities.
2) Improve thought processes with learners through speedy progress in higher thinking skills
3) Accelerate mental learners abilities to understand scientific concepts, and thus find it through using the cognitive acceleration strategy became science and knowledge within the prescribed curriculum by using this template presents certain difficulties for most learners challenge their thinking is better than being a traditional curriculum becomes a curriculum learn the new learners can understand these difficulties by providing thought-provoking activities.
4) Cognitive acceleration strategy designed to accelerate the mental development of knowledge through cognitive intervention on mental adjustment to the learners to revive traditional curriculum through activities included in this template which is designed for the development of cognitive conflict and social construction of learning and thinking in reflection.
5) Increase the ability of learners to build their personal knowledge through conducting these activities themselves, enabling them to deeper understanding of the subject and stimulate thought processes, thus speeding up thinking abilities and develop their abilities to generate new ideas.
6) The development of thinking about thinking, where learners are encouraged to think about their thinking and awareness of their own thinking through events and attitudes that interact with it.
7) Cognitive acceleration strategy for learners the opportunity to cooperate with each other, and have a common understanding of language on the subject through details that interact during the debate leading to growth and accelerate their thinking.
8) The cognitive acceleration strategy teaching method aimed at consolidating the concept of cognitive mental challenge learners through asking questions by the teacher and the proposal to answer by learners, through open-end thinking activities prepared by the teacher for his literate included in this template and these activities provide learners and especially young psychological atmosphere is safe to express themselves, when it gives learners the opportunity to find the largest number of possible solutions to a given problem that put learners in an attitude helps them to review their answers if they sense alternative by mistake, choose the answer that they deem best answers, this does not mean that the teacher and learners others view the work of learners, but important to know that the learner himself had that special wisdom on his work and that his opinion is true, because it is based on the standards and levels of self-saturated and private and when the answer is either true or false, the ultimate source of the solution is always going to be external is usually a teacher or teacher's book.
9) Activate the right brain and left sides together (whole brain), if they are working on raising the levels of mental and brain activation and development of various types of thinking such as visual thinking (by materials and tools for classroom activities), and critical thinking (by modifying paths thinking, thinking about thinking), and creative thinking (by devising new ways of thinking, etc.).
10) Develop learners ' mental capacities in analysis, when learners to analyze opposing positions and identify discrepancies and to try to integrate the harmonious thinking patterns with brain and with the strategies they have stored, and integrated knowledge infrastructure and regulation when learners. (razouki and others, 2015:69-71).

Steps for using cognitive acceleration strategy:

This strategy involves four basic steps as he sees all of (Yusuf and Afaneh, 2009:245-246) (), and are as follows:

1) Preparation Concrete sensory
2) Cognitive conflict Cognitive Conflict
3) Beyond knowledge (thinking about thinking) Thinking in Thinking
4) Bridging

Following is the explanation and detailed steps of this strategy:

1) Setting the stage

The sensuous introductory step essential to confirm initial understanding of student's problem, and configure the real meaning of the concepts of problem they have, as is note difficult concepts And new terminology among students, as well as learn new devices used, and knowledge of various scientific concepts for the lesson, and configure their understanding of these concepts, and care about this personal development and social construction of student exchange and share information among themselves.

The role of the teacher in this step:

- The teacher tries to divide learners into several groups to be fruitful discussions.
- Teacher in the move to put the problem on learners and recycling discussions.
- The teacher is more than just a source of information or management, and more of a facilitator and facilitator of the learning process but be directed to activities and discussions that play an important role in the development of thinking
- Teacher raises a lot of questions students individual or collective, to find a common language of understanding between him and the students
- Gives the teacher opportunity for students to express their relations or used or actions that you execute.
- Teacher connects between the experiences gained by learners in the class and experience of everyday life.

2) Cognitive conflict

This step is the central idea of this strategy is to place a problem or issue that the student can find the right solution to her by using different ways of traditional thinking, it could be argued that a contradiction between filming for one concept, one other former new knowledge and structure represents Sound scientific visualization, cognitive conflict reflects the student's condition when he falls under the

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influence of attitudes or concepts incompatible with what there is in the cognitive structure of concepts about the natural environment, and resolve this contradiction when the student understands the perception error has and when there is a conflict between the concept in the Student's knowledge structure and sound scientific concept and the new, the process of bringing the concept of proper scientific cognitive structure to the student produces a modification or change of concept, this is what is called the conceptual change, and requires that the reorganization or building student knowledge structure concepts, therefore, The conceptual process of change is the product of cognitive conflict.

The role of the teacher in this step
Teacher uses the student's puzzling and difficult activities until it reaches Mount Everest barefooted student thinking, but also so he can get into a State of balance. This step includes:

- Learners through sensory activities to viewers a surprise them because they don't agree with their expectations, and chime in with their motives or previous experience or direct experience with them at the beginning of the activity
- Generated as a result of this surprise state of wonder and admiration invites learners to revisit their knowledge and way of thinking in order to adapt to new empirical evidence.
- Can note cognitive thinking skills learners through cognitive hierarchy and move from lower to higher capacity.
- If students have surprise motivated to carry out the activity with enthusiasm and motivation to resolve problematic cognitive conflicts facing

3) Beyond knowledge (thinking about thinking)
the consciousness of individual thinking and the ability to know what we know and what we don't know, the aim of this phase is to develop the capacity of the individual to plan strategies for using the intellectual processes lead to the production of the information required, and these processes require individuals to be WA well aware of steps involved while solving problems and their hopes, and their production calendar, thinking of thinking is the awareness of the individual and aware of what is learned, so that the students ' awareness of their experiences and activities of reflexology during their interaction with the learning situations develop skills Thinking, as they can generate creative ideas and incorporate new experiences gained with previous experience leading to accelerate mental, cognitive, and there is a big role for cognitive learning and cognition over solving problems as delivering (Swanson, 1990) to learners who have the realization over Higher knowledge they have better performance who have skill grasp above lower cognitive nexus (two Pugs, 1999) with higher thinking skills of analysis and composition and calendar.

The role of the teacher in this step:

- The teacher asks students to reflect on their thinking or thinking processes to develop abstract thinking.
- Encourage students to talk with each other about how to solve problems, and through their own thinking activities
- Providing them with the means to implement each activity which makes it easy to investigate, as can his students to design experiments and activities that contribute to the solution of themselves leading to accelerate allen cognitive mental for students.

This step includes:

- Thinking learners in the reasons for thinking the problem by questions posed by the teacher (like how you did that? Why? Why i thought this solution? Why i thought this think?)
- Educated understands the kind of thinking we used to solve the problem, so that they can organize the ideas and their autonomous steps, which leads to the rapid growth of their thinking skills and thus increase their cognitive development.

4) Bridging
Intended to build bridges between the experiences obtained from the activities included in the curriculum they teach and experience everyday life making what they learn is relevant to their lives and meaningful career for themselves and the world around them, it means using the way of thinking in another position in the same subject , And then move on to use the same method of thinking skill in different life or in another position of science, or in other parts of the curriculum, to build bridges between the intellectual activities and practical life is my injury to get educational experience of the theoretical framework to practical life applications framework .

Linking teacher between past experiences gained by students in class with everyday experiences, so that successful teachers in using thinking science activities (gastric by using cognitive acceleration strategy) often attract students use patterns Thinking they have learned in a new context, and perhaps in other parts of the science curriculum or material other than science or in other areas or in everyday life, so it was rather on the teacher at the end of each lesson that asks students how to utilize what they have learned in their activities , And can clarify the process of bridging through the following question posed by a teacher on his students (how can you relate what you have learned today in your work life?). (' Afana, Yusuf, 2009:246), (Abu Hijleh, 2007:33)

Researchers has benefited from previous steps in the preparation of their plans on experimental research sample, it was an important role in the preparation of classroom activities, as well as from and guide for students, as current sensory experiences have been linked earlier information of students through activities and cognitive conflict when students where they have engendered a State of wonderThis helped them to think and find solutions to resolve this conflict and through reflection on the reasons that led to the conflict knowledge to solve their problems, then find relationships between new experiences and practical life. Foundations that must be considered when using cognitive acceleration strategy:

1) Teacher training on modern strategies methods that contribute to the development of the ability of learners to think about, since the methods used by the teacher role in spreading the right weather for training on thinking and raise.

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2) Teacher training must learn strategies that focus on teaching learners how to learn instead of leaving to save because that will reflect the thinking of learners and their performance in the classroom.
3) Avoid using words of criticism and demonized in his responses on the wrong or missing answers.
4) To respect the learner initiatives and appreciates his thoughts and uses methods appropriate reinforcement especially with undecided or timid or low motivation to develop the level of motivation to learn.
5) That gives the learner a sufficient length of time to think before demanding the answer to providing a favorable environment for reflective thinking and logical thinking.
6) To listen intently to the thoughts of learners and their answers and comments and strengthened by appropriate verbal permission to interrupt the speaker, but gives everyone the right to express his opinion freely.
7) To better surmise the learner expected to outperform than an incentive for him to work. 8. Avoid obstructing behaviours reflect or prevent more depth in cognitive therapy for errands on learners.
8) Ensure that learners guidance and feedback on their answers when they use language through accurate or specific.
9) Uses phrases associated with thinking skills and processes he asks questions that lead to discussion and problem solving and decision making.
10) Training and encourage teachers to use teaching strategies that contribute to the development of the thinking of learners, that develop among them a spirit of positive cooperation and competition, independent thinking, as well as individual and collective responsibility, so we should take in individual learners in learning methods for the development of higher thinking skills they have. (razouki and others, 2015:72-73) .

Thinking skills over knowledge: he studies since the early 1970s around the concept of thought processes and knowledge above identify a number of higher skills, managing and directing thinking activities when an individual engages in an attitude problem solving or decision making. There are different classifications of thinking skills over their knowledge ●classification of O'Neil and Abedi (1996)

- Classification of lee (1992)
- Classification of sharu and benson (1994)
- Sharuzubaydah (2011)
- Sharumarzoni et marazano.2004)) referred to in (abu rayash and ghassan, 2008) sponsored by the association for curriculum and educational supervision in united states a comprehensive breakdown of all thinking skills over knowledge. (abu rayash and ghassan, 2008:387 – 389).
- Classification of Sternberg Sternberg, 1985)) in three main categories: planning, monitoring and evaluation. Each class of branch skills has a number of sub skills can be summarized as follows:

1) Planning

a) Goal setting, or a problem.
b) Determine the nature of the implementation strategy and skills choose
c) Sequence steps
d) Identify possible steps identify difficulties wa methods for errors and predict the desired results, or expected

2) Observation and Control

a) Keep on target in focus
b) Maintain the sequence of steps
c) Knowing when the goal of a sub
d) Knowing when to move on to the next process of choosing appropriate process followed in the context
e) Detect obstacles and mistakes
f) Learn how to overcome obstacles
g) Get rid of errors

3) Evaluation and A Skills Assessment

a) Evaluation of goal achievement
b) Judging the accuracy and adequacy of results
c) Assess the appropriateness of the methods used
d) Assess how to address obstacles and mistakes the effectiveness
e) Evaluation plan and implement them. (saadah , 2006:80-81)

All these classifications relied on three skills revolve around three basic skills in content planning, monitoring and evaluation skills are themselves followed in classifying Sternberg so the researcher adopted to classifying skills for the world of Sternberg and planning and monitoring and control and calendar And several sub skills are branched.

Thinker properties above:

The cognitive learner to thinking skills over knowledge possessed the following characteristics

1) Sets the target and truly steps
2) Adhere to the prescribed plan under flexibility
3) Musing what to do or think
4) Evaluate every step in his work.
5) Watching what he does. And thinking and meditating in other thinking
6) Don't leave things unconsciously or planned.
7) Take time in decisions making.
8) Eliminates from his word can't everything be done in learning and persistent
9) Cares identify weaknesses in his performance even addressed (shorouk, 2009).

And researchers that the learner is thinking up that properties

1) Cognitive self learning exercise during tasks.
2) Staying engaged hard during the learning process.
3) Planning and organizing and learning process.
4) Ability to manage behavior when the absence of external constraints.
5) Interested in collaborative learning and assistance when needed.
6) Have that motivation and make the effort when performing activities.
7) Organize prior knowledge and recall in new learning situations

Importance and stages of learning thinking skills over knowledge:

(Al ghraoui, 2010) presented the thinking skills over knowledge helps learner awareness levels of * thinking and

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mental abilities with various educational positions to help him modify thought patterns that thinking becomes more flexible and this To improve thinking and better use him during the learning process as a process of learning and thinking skills over four stages of cognitive development:

1) Phase one: based on learner motivation effects through the stimuli offered to provide opportunities to achieve no result means no achievement tasks Required.
2) Phase two: guiding the learner's initial ways is done by having noticed the second learner model based on his own experience
3) Phase three: develop learner to talk to oneself for the learner to understand cognitive processes and develop his skills through Practice with this skill transfer to new positions
4) Phase fourth: to employ cognitive processes, and effective (Al ghraoui, 2010:93) ()

Studies on the impact of cognitive acceleration in recovery strategy with other variables.1

results	Statistical means	tools	sample	stage	place	Aim of study	researcher
A high amount of cognitive acceleration project impact on growth and achievement levels compared with national level	(T. Test)	Test of cognitive ultra	**(**105**)** Students from Parkside school	7th stage students	British	Impact of time on students ' cognitive Accelerator Project Participants cognitive and academic achievement through science education	Adey & Shayer, 1994
There is a difference statistically significant at 0.05 level between the two groups and the achievement test and control beyond the knowledge for the benefit of the control group	Two Independent t-test- Point correlation coefficient brisial coefficient of Cronbach Alpha Formula Cooper correlation	Achievement test and measure skills beyond knowledge	(56**)** With 28 students from experimental and control group	4th scientific stage	Iraq	Cognitive acceleration strategy impact in biology and collection skills beyond knowledge to fourth graders scientific	Alawady 2014
.Statistical differences in the acquisition of the sample for the experimental group and also on academic probation mathematical thinking	T test-test) two separate study hypotheses And Kai-sequare Test	1. exposure test to measure the sample acquisition 2.2.mathematical thinking test	(92**)** With 45 students from experimental group and 47 from control group	2ndstage students	Iraq	Impact model led and Adey and Shair steroids to gain second graders average skills to resolve the issue and the development of mathematical thinking	alkhafajy **2016**

.Studies on thinking skills over knowledge as a dependent variable.2.

results	Statistical means	tools	sample	stage	place	Aim of study	researcher
The two experimental groups were superior	Analysis Of Variance And equation Of Kyoder – Richardson 20	Testing the comprehension of physical concepts and testing cognitive thinking skills	male**57** **50**and female	4th class secondary school	Iraq	Study the impact of self-k.w.l.h table strategy to absorb the fourth graders and equip them with physics concepts scientific thinking skills over knowledge	Mohamed Ismail Salman 2012
The two experimental groups were superior	Pearson correlation coefficient and T test	Achievement test and the scale of thinking skills above cognitive	**108** students	3rd class secondary school	Iraq	Impact of paradigm Thinking Maps cube in cognitive thinking skills above second grade students average & achievement for physics	Azhar BurhanIsmail Ebrahim**2013**
Outperform the experimental group	Diffusion analysis and Shivian test, Pearson correlation coefficient and T-test	Test the achievement and test cognitive skills above cognitive	**بواقع 103** Male**53** and **34**female For Control group	4th class secondary school	Iraq	Effectiveness of cognitive strategies in learning cycle collection of physics students scientific thinking skills fourth above cognitive	Abbas Jawad AlRukabey **2015**

5. First Choice of Control Design

The choice of design depends on the nature of the study and the conditions or conditions under which it is conducted. Therefore, the researchers adopted the experimental design with the post-test and partial control of two equal groups (experimental and control).

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Flowchart (1) experimental design for research

physics	المتغير المستقل	التكافؤ	group	No.
physics	Strategy of cognitive acceleration	Age in months IQ Previous knowledge	experimental	**1**
	Traditional way	Thinking skills over knowledge	control	**2**

Second: research community and research sample

research community consists of all students of the Physics Department at the Faculty of Education for Pure Sciences - Anbar University in the morning study for the academic year (2016-2017) for the second phase, which is (44) students from Baghdad and Karkok and the research society was identified.

Research Sample After selecting the research community, the researchers chose the society to represent the sample of the students from the Department of Physics / the second phase (morning study) intentionally and because of the cooperation of the teachers of the material, the number of (44) students to two groups equal in the number as shown in the table1.

Number of students	Independent variable	groups	No.
22	Strategy of cognitive acceleration	experimental	**1**
22	Traditional way	control	**2**
44	**2**	**2**	summation

Third: The equivalence

Of the two sets of research: research procedures required the distribution of the students of the research sample in two groups, one experimental and the other control, to prevent the effect of the results of the experiment on the differences between the students of the two groups and then verifying their equivalence statistically in the following variables,

- Age of students calculated in months
- Intelligence • Test of previous information
- Thinking skills over cognitive
- Age of students calculated in months

The researchers obtained the chronological age of the students of the two groups of research of the civil status of the students of the two groups and then calculated (1/3/2016). Man-Tenni showed that the value of Mann and Tenni calculated (273) is greater than the scale of (128) and this indicates that there is no significant difference The statistical level at (0,05) betweenThe experimental and control groups, ie both groups are equal in this variable, as shown Table (2).

Table 2

Thinking skills over cognitive		Previous information		iq		age		
control	experimental	control	experimental	control	experimental	control	experimental	
22	**22**	**22**	**22**	**22**	**22**	**22**	**22**	Sampel size
20,91	**24,09**	**21,77**	**23,23**	**21,82**	**23,18**	**22,73**	**22,27**	Rank mean
460	**530**	**479**	**511**	**480**	**510**	**500**	**490**	Rank sum
182		**182**		**182**		**182**		Man and Tinni Tabular value
207		**226**		**227**		**273**		Man and Tinni Calculated value
Non significant								Scientifiic significant

-IQ

(IQ test)

To verify the parity of a sample in the mental capacity variable one must select an IQ. The Raven Scale of Mental Capacities was selected as a result of its reliability and consistency After its definition of the Iraqi environment. This scale reveals the similarities and differences between forms, consisting of five groups per group (12) paragraphs. The Raven test for matrices was applied to the research sample at the beginning of the academic year (2016-2017). Using the Mann-Watten sample test due to its application in a number of local studies proving its validity,For intermediate samples to calculate the significance of the differences between the mean scores of the two groups in the IQ scores, if the results show that the value of Mann and Tn favoritism (227) is greater than the table value (182), indicating the absence of statistically significant differences that the two groups are equal in this variable.as shown in table 2.

Test the previous information

Test the previous information used to measure the previous information in the thermodynamic material, which is an important influence in the dependent variable, the researchers prepared a test was adopted in the construction of paragraphs on the first semester of physics lectures scheduled for the second phase. The test consisted of (25) thematic paragraphs of multiple choice type. The test was presented to a committee of specialists in physics and methods of teaching science (1) to verify its integrity and validity of its paragraphs. It was agreed unanimously on the validity of its paragraphs with minor modifications,The test was applied to the experimental and control groups on Tuesday (1/3/2016). The researchers corrected the students' answers to obtain the scores of the two research groups. Man-Tenni found that the calculated value of Man and Tinni of (266)(182). This indicates that there is no statistically significant difference at (0.05) between the experimental and control groups, ie both groups are equal in this variable. Table (2)

Testing cognitive thinking skills based on cognitive skills testCognitive development by researchers after confirming the cychomertric characteristics in time the Tuesday morning (1/3/2016), and after unpacking student responses on the test and the adoption of the Mann – Whitney shows that value of an – Whitney calculated (207) is greater than the value of the indexed (182) this indicates that there is a

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difference Statistically significant at a level (0.05) between the two groups and any officer that both groups are equal in this variable table (2)

Formulation of behavioral purposes:
In the light of the General objectives of teaching the Thermos dynamic in the second phase of the Physics Department has been drafting) 158) behavioral purpose grouped six levels of Bloom's taxonomy (Bloom) in the cognitive domain: (remember, comprehension, application, analysis, synthesis, and evaluation). (6) the initial image was displayed on a group of specialists in the field of science teaching methods. Supplement) 1) to indicate their views on the accuracy and clarity of wording and coverage of the content material and determine the level at which the value every purpose and accordingly adjusted some behavioral purposes in terms of formulation,

Table 3: Behavioral uses distribution between levels

sum	evaluation	composition	analysis	applying	composition evaluation	remember	level / content
35	**2**	**2**	**5**	**1**	**13**	**12**	Key concepts in the science of thermal movement
26	**1**	**2**	**1**	**2**	**8**	**12**	Temperature measurement
81	**4**	**5**	**6**	**14**	**34**	**18**	Rules in thermo dynamic
16	**1**	**1**	**2**	**1**	**5**	**6**	Properties of pure substances
158	**8**	**10**	**14**	**18**	**60**	**48**	sum

6. Research Tools

Achievement test

Means that the tool that is used to measure the knowledge, understanding and skill in the subject or specific training or a kit. (Majid Yasin, 2012:25) (A) the researchers took the test numbers are (50) objective test type (multiple choice), being: ' is one of the most important and most comprehensive precision substantive tests to measure levels of knowledge '. Supported in its building on six levels of Bloom's taxonomy of the cognitive domain as in table (4)

Table 4: Test map for the achievement test passages as a material second chorus

Percentage of behavioral uses levels									content	
Summation 100%	evaluating 5%	composition 7%	Analysis 9%	applying 11%	understanding 38%	remembering 30%	Importance %	Hours number	Chapters	ت
13	**1**	**1**	**1**	**1**	**5**	**4**	25%	**4**	Basic concepts in science	**1**
3	**0**	**0**	**0**	**0**	**2**	**1**	9%	**1,5**	measurement temperature	**2**
26	**2**	**2**	**2**	**3**	**10**	**8**	50%	**8**	movement laws	**3**
8	**0**	**1**	**1**	**1**	**3**	**2**	16%	**2,5**	Prosperities of thermodynamic Material	**4**
50	**2**	**4**	**4**	**5**	**20**	**15**	100%	**16**	summation	

And make sure: **1. sincerity test:** 'test of sincerity is the most important factors regarding quality tests. (Al-Kubaisi, Abdel Wahid, 205:2015) (A) for the purpose of verifying the achievement test virtual honesty on this research paragraphs is displayed with a set of behavioral experts and arbitrators of observations and opinions about the validity of these paragraphs, and having adjusted some paragraphs checksums, the percentage agreement between arbitrators and experts (80) more, bringing back a valid test paragraphs. in order to ensure both the calculated the cychometric characteristics:

A-discriminatory power: means the ability to distinguish between paragraph (high College grades test) and lower (low College grades Testing) any ability to distinguish individual differences between individuals who know the answer and who don't know the correct answer to each paragraph of the test (Al-Kubaisi, Abdel Wahid, 180:2015) () in order to ensure the ability of the test to distinguish between students who are able to answer and who do not Value, then the exploratory sample ranking in descending order ofFrom highest to lowest, and took postgraduate degrees (22) and (22) from the lower echelons, and discriminatory power was calculated for each paragraph of the test, it was found that the distinctive power of test scores ranged from (0, 30-0, 59), a paragraph is acceptable if plants distinguishable over (0, 30).

B- Coefficient of difficulty: to know the coefficient of difficulty paragraph helps to know which paragraphs are very difficult or easy for students, and can express the difficulty of paragraph by the number of students who answered the correct answer to total them, and how much for the difficulty factor called The more that this amount easily para lower this amount back difficult paragraph (Kubaisi, Abdel Wahid, 167:2015). Researchers have difficulty factor law paragraphs found they ranged between (0, 39-0, 74) in this paragraph is a good test and an appropriate level of difficulty azetraoh difficulty coefficient between (0, 20-0, 80).

C- Effective alternatives: alternative is wrong doing when students who chose him in the group more than minimum number of students who choose alternative himself in the upper group (alkubaisy , Abdul Wahid, 184:2015) () in order to ensure effective alternatives to the achievement test applied paragraphs Equation of effective alternatives. The results of the application of the equation of effective alternatives for all negative paragraphs, and have been found ranging from (-0037 (f)-0296) this means that students have

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a faulty replacement disguised quiters marking the wrong alternative educational testing effectiveness.

Reliability test: means giving the test results themselves, if returned to the individuals themselves and in the same circumstances. (Al-Kubaisi, Abdel Wahid, 205:2015) (), In order to ensure the reliability of the test, the researchers used Alpha equation alphcronpach, the researchers chose Crewe random answers (10) exploratory sample composed of students (22) of the Faculty of education second stage in pure alternate location Abu Ghraib.

Paragraphs above thinking skills test

To measure cognitive ability sample search on thinking skills over knowledge that requires a test measuring this variable the researchers briefed on tests and measurements in the literature and previous studies in this field as Musawi (2012) () and study Mohamed Ismail Sulaiman (2012) () and study the Alghamdi (2012) () and studying Al-Azzawi (2013) () and study the staps (2015) () and the tests were built according to the following steps above thinking cognitive.

1) Goal setting of scale: this test is designed to measure cognitive thinking skills over when second stage students Physics Department in the College of Education Sciences.
2) formulation of paragraphs test:-formulating special instructions to answer the test clauses in addition to determine the time of answer, thus building a test composed of three paragraphs essay answer each measure specific areas of knowledge respectively in regulation has been prepared (17) substantive paragraph n Week 3-multiple choice alternatives spread over thinking skills over knowledge (6, 6, 5) respectively (planning, monitoring and control, evaluation) bringing all paragraphs (20).
3) Test sincerity, honesty was confirmed in two ways
   a) For the purpose of ascertaining virtual honesty sincerity test virtual presentation to a group of experts to demonstrate its relevance and accuracy of its distribution to the skills and suitability for belongs to the capacity in which they were intended and 80 more agreement ratio criterion for validity Paragraphs
   b) Honesty construction internal consistency: that each of its paragraphs must go on the same path the overall test required thatWhich represents a coherent overall concept for the property to be measured every paragraph of the scale should be aligned with other paragraphs in testing and compatibility means that deleted or replaced, and honesty were confirmed by calculating Pearson correlation coefficients ranged (0, 24-0, 58) they function Statistically. (Al-Kubaisi, Abdel Wahid, 2015:205)
4) Application of exploratory testing: for the purpose of determining the time required to answer the test paragraphs and paragraphs and clarity of his instructions were applied the test thinking skills over knowledge on a sample of in education students (22) for pure non-covered by the sample Basic education students Research University of Anbar first exploratory sample again (50) students from the Faculty of education, and after extracting temporal average found that (45) minutes, the researcher correct answers students test paragraphs to extract the cychometric properties as the following:
   a) **Discriminatory power**: researchers calculate the discriminatory power each paragraph of the test using the equation of discrimination as that found between (0.20-0.70), paragraph is acceptable if plants distinguishable than (0, 20) (Al-Kubaisi, Abdel Wahid, 167:2015) so that all paragraphs Accepting it.
   b) **The difficulty coefficient of test paragraphs**: calculating difficult substantive paragraphs found ranging from (0, 39-0, 51) compared to standard (0, 20), the more we find that paras was fairly acceptable.
   c) **Effective alternatives:** after calculating effective alternatives popping up all negative values, this means that the false alternatives had attracted a number of students more than the minimum set high set this indicates effectiveness. (Al-Kubaisi, 2015:167).

2.4 fastness test paragraphs thinking skills over knowledge

In order to test the researchers adopted a stability calculation method of internal consistency and apply equation (Alpha Crow nbakh) that contains the test essay answer specific paragraphs (0, 1, 2) and objective reliability ratio amounted (0.81), which is acceptable and that The test became ready to finalize the core sample (Kubaisi, Abdel Wahid, 205:2015) () has been retesting after two weeks and was steadiness between the first and second applications.

7. Statistical Methods

1) Rank mean and the sum of the ranks to calculate the final results of the achievement test and chose the teaching skill click and Gnostic equal variables (calculated months chronological age, IQ, test the previous information, test thinking skills over knowledge).
2) Equation of man Whitney two separate equal to calculate the final results of the achievement test and skills test think click to calculate parity in cognitive variables.
3) An equation (Alpha Cronpach) to find steady achievement test and cognitive thinking skills over test that tests contain paragraphs essay and objective.
4) Equation of coefficient of difficulty and distinction of substantive achievement test thinking skills over knowledge.5. Equation of coefficient of effective alternatives used to find effective alternatives to the substantive paragraphs (multiple choice) the achievement test, and the test thinking skills over knowledge.

Search application procedures.

1) It was agreed with the Professor article about application experience and with his introduced steps to teaching strategy.
2) Second chorus began on Monday with 28/2/2016 date of the academic year (2016-2017) stress was not telling students to research and nature.
3) In the first lecture on 1/3/2016 on Tuesday keen researchers make the qualifications before starting the actual teaching of the course in the alternate location of Baghdad (Abu Ghraib).

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4) Studied experimental cognitive acceleration strategy group according to daily plans accordingly (extension form 4) control group was taught as usual way according to plans Appendix b (4) in alternative site in Kirkuk University.
5) The achievement test was applied post on my collection of experimental and research officer on Wednesday 18/5/2016 student was informed of the date the week before the test date.
6) Thinking skills test was applied above the pilot and research groups Gnostic officer on Thursday 19/5/2016 no absences.
7) The researchers corrected the answers students find groups (experimental and control) of the tests, and after (3 days) return correct answers again for the purpose of verifying the accuracy of the results where the researchers conducted statistical processing and analysis of the results and their interpretation of the answers students.

8. View results and interpretation

In order to verify the zero goal following research researchers developed two hypotheses: first zero hypothesis:

There is no statistically significant difference at the level indication (0.05) between the average grades of the experimental group students studying grades according Cognitive acceleration strategy. And control group students studying grades according to the usual way in the achievement test of the thermodynamic experimental groups students grades were calculated studied using cognitive acceleration strategy, and officer examined the regular way, in the achievement of the test substance thermodynamic statistical results showed that the average rank of experimental group students collecting degrees (29.7), and rank average for control group students collecting degrees (15.3), and the value of the Mann-Whitney calculated (83.5) and are smaller than the indexed value of (182), this indicates that there is a difference d Statistically between the two pilot and officer for the experimental group in a variable academic achievement, zero hypothesis rejects first.

Table 5: Average value of rank mean of Mann-Tinney degrees of attainment for groups

Significant	Man Tinni value		Rank sum	Rank mean	number	group
	tabular	Calculated				
Significant	182	15,5	721,5	32,8	22	experimental
			268,5	12,2	22	control

9. Interpretation of results interpretation of results

Of the first zero hypothesis: it is clear from the results that were presented to cognitive acceleration strategy had surpassed the normal way in teaching the thermodynamic and this result can be interpreted as:

1) Cognitive acceleration strategy contributed to accelerate mental development of students Research sample By giving them the opportunity to train their minds to participate in an exchange of views in a cordial atmosphere and challenge ideas justify retaining by respect.
2) The cognitive acceleration strategy teaching formula requires a lot of classroom discussions as an opportunity for each student to participate in collaborative learning and thinking, through his mind as he says, and then students acquire the competition and self confidence through their use of positions that require thinking they have.
3) To view the lesson is confusing for students scientific activities helped students ' cognitive conflicts prompting it to use previous ideas and rebuilt again in his brain, his balance
4) Discussion questions while implementing classroom activities helped students interact with search sample And invest their knowledge and previous experiences, so the participation in class.
5) The learner's consciousness thinking re thinking helped to develop and improve brain capacity growth and this generates structured ideas in the mind of students down to the proper solution and that this in turn leads to link the experiences gained by students in lessons with the experiences of everyday life.

Interpretation of the results the second zero hypothesis:

1) After viewing the research findings back to cognitive acceleration strategy also excelled on the usual way to test thinking skills over knowledge and can explain this conclusion:
2) Cognitive acceleration strategy for students an opportunity to collaborate positively with each other and their common understanding language consists on the subject through details that interact during the debate leading to growth and accelerate thinking above knowledge.
3) Teaching according to cognitive acceleration strategy perceived movement of students from the abstract, analyze information, and access to the results scientifically logical, requiring him to do mental processes with varying levels based on himself, with help from the teacher.
4) The students reacted with strategic steps meticulously contributed to the exchange of knowledge and concepts and discuss ideas for access to correct information as well as the role of the teacher in control and guidance enabling them to think up a proper solution.
5) Teaching according to cognitive acceleration strategy, led to the promotion of freedom of opinion and debate in a democratic atmosphere away from
6) Teaching according to cognitive acceleration strategy helped students to provide a new opportunity in mental focus and link previous experience in creating new bridges of the commonwealth for learner information by creating dissatisfaction among students and providing activities that support solutions which positively impacted the thinking skills over knowledge they have.
7) The strategy used to help recall information better than the normal way so that teaching in a collaborative environment keep learning for a long time.
8) Develop cognitive acceleration strategy mental abilities of students in analysis, when students analyze conflicting attitudes and identify the inconsistencies and try to incorporate harmonious thought patterns with the brain

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and with the strategies they have stored, and integrated knowledge infrastructure and organized by students.

9) The cognitive acceleration strategy helps to stimulate higher mental skills for students such as calendar by allowing him to express an opinion and judgement in matters concerning his career and that the fourth step (bridging) of the strategy.

10. Conclusions

The researcher concluded the following conclusions:

1) Using the knowledge acceleration as a sample of the teaching for all stages of the university in all subjects.
2) Held workshops for training the staff to learn them how to use the strategy of knowledge acceleration and don't depending on reading and keeping the information only.
3) Insert the knowledge acceleration within the teaching methods syllabus which is used to teach the students of education faculty and explains the main steps which are used for setting the education process.
4) Using the knowledge acceleration strategy in teaching physics for its activity and its positive effect which is clear in achievement and thinking over knowledge.
5) Its necessary for the teaching staff to use the thinking skills over knowledge and then training the students for the different situations in order to verify the different educational situations in order to improve the active teaching which fits with their trends towards the self-learning to face the challenges of 21 century.

11. Suggestions

The researcher suggests the following suggestions:

1) The effect of the knowledge acceleration strategy in achievements of the following subjects (chemistry , Biology, and computer) in different education stages.
2) Make the similar studies but by using different variables like: (creative thinking, problem solving , and concepts corrections).
3) Make a comparative study between the knowledge acceleration strategy and the other strategies in order to find which one is more active than the others in achievements and thinking types.
4) Make research which specializes in particular side of the subjects which contains laboratory .

Resources

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Names of experts

Type of question				Specilization	Address	Scientific degree	Names of experts	No
Thinking test	Behavioural purposed	Achivment test	Teaching plans					
*	*	*	*	Math methods of teaching	Alanbar university	profesor	Dr.AbdulwahedThamerAlkubaisey	**1**
*	*	*	*	physics methods of teaching	Almustanserya university	profesor	DR.YousiffadhelAlwan	**2**
*	*	*	*	physics methods of teaching	Mosul university	profesor	Dr.Abdulrazaqyasen	**3**

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*	*	*	*	physics methods of teaching	Baghdad university	Assistant profesor	DR.HAnan Abdulmajed	**4**
*	*	*	*	Chemistry methods of teaching	Almustanser ya university	Assistant profesor	DR.Yousiffaleh	**5**
*	*	*	*	**ط.ت.الفيزياء**	Baghdad university	Assistant profesor	DR.Mayson Shaker	**6**
*	*	*	*	**ط.ت الكيمياء**	Almustanser ya university	lecturer	Dr.AdnanHikmat	**7**

Data of equivalence variables for students of the control group					Data of equivalence variables for students of the experimental group					
Skills of thinking over knowledge 20	Previous information test 20	IQ 60	Age in months	gender	Skills of thinking over knowledge 20	Previous information test 20	IQ 60	Age in months	gender	ت
17	12	39	255	F	25	19	51	257	F	1
22	13	57	253	M	30	11	52	273	M	2
25	13	31	261	F	24	14	52	258	M	3
19	11	53	244	F	18	13	41	249	F	4
25	12	54	250	F	19	20	55	250	F	5
21	18	47	281	M	16	10	44	252	F	6
19	9	51	240	M	18	16	48	257	F	7
26	16	46	252	F	20	12	46	264	F	8
22	13	37	262	M	17	13	53	259	M	9
17	12	26	257	M	25	16	48	247	M	10
24	9	45	267	M	28	18	35	260	F	11
20	14	37	254	M	21	14	52	262	M	12
18	20	56	244	M	24	17	54	253	F	13
17	15	54	245	M	22	12	30	240	M	14
24	22	54	240	F	21	15	53	244	F	15
26	10	49	245	M	18	16	50	246	M	16
16	17	49	261	F	26	13	51	250	M	17
25	19	48	260	F	16	9	38	240	M	18
21	14	52	240	M	25	7	44	251	M	19
15	17	33	248	F	24	18	49	244	F	20
25	12	51	265	M	26	20	49	251	F	21
22	16	44	249	F	26	15	53	250	F	**22**

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