

The impact of the snowball strategy on the scientific sense and future thinking of sixth grade students in the English language

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Abstract

The study aims to identify: The impact of the snowball strategy on the scientific sense and future thinking of sixth grade students in the English language. To verify the two objectives of the study, the researcher developed two null hypotheses, and also used the experimental design with two equivalent groups (experimental group and control group), the research sample consisted of (78) students from the sixth grade of primary school in Kufa Model School for Boys, which is located in Al-Zahraa quarter on the left side of the city of Mosul _ Iraq, and after excluding the failed students from the sample, the size of (68) students divided into two groups (36) students in Division (A) and (32) students in Division (B) and accordingly Division (A) will represent the control group while Division (B) will be the experimental group, to suit the number of students in it to teach snowball strategy.

The results showed that the experimental group that was studied according to the snowball strategy in favor to the control group that was studied according to the traditional method.

Keywords: the snowball strategy, the scientific sense, future thinking, English language

أثر استراتيجية كرة الثلج في الحس العلمي والتفكير المستقبلي لدى تلاميذ الصف السادس الابتدائي في مادة اللغة الإنكليزية

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الملخص

يهدف البحث إلى التعرف على أثر استراتيجية كرة الثلج في الحس العلمي والتفكير المستقبلي لدى تلاميذ الصف السادس الابتدائي في مادة اللغة الإنكليزية. وللتحقق من هدي البحث وضعت الباحثة فرضيتين صفريتين، كما استخدمت التصميم التجريبي ذا المجموعتين المتكافئتين مجموعة تجريبية ومجموعة ضابطة، وتكونت عينة البحث من (٧٨) تلميذا من تلاميذ الصف السادس الابتدائي في مدرسة الكوفة النموذجية للبنين، والتي تقع في حي الزهراء بالجانب الأيسر من مدينة الموصل - العراق، وبعد استبعاد التلاميذ الراسبين من العينة بلغ حجمها (٦٨) تلميذا، بواقع (٣٦) تلميذا في الشعبة (أ) و (٣٢) تلميذا في الشعبة (ب) وبناءً على ذلك ستمثل الشعبة (أ) المجموعة الضابطة بينما شعبة (ب) ستكون المجموعة التجريبية، لملائمة عدد التلاميذ فيها لتدريس استراتيجية كرة الثلج، وقد أظهرت النتائج تفوق المجموعة التجريبية التي درست وفقا لاستراتيجية كرة الثلج على المجموعة الضابطة التي درست باستخدام الطريقة الاعتيادية.

The Problem of the Study:

Our world today is witnessing more challenges and crises as a result of epidemics and wars, in addition to natural disasters that have significantly increased and affected all areas of economic, political social life and other fields were the main reason for the interest in scientific research and investigation of the best ways to get out of these crises and challenges and face them in correct scientific ways, positive and effective scientific ways, which prompted the developed and developing countries of the world alike to focus on raising an educated, conscious and good generation that serves its society in scientific ways by supporting it with energies and natural resources in the society in which he lives and the student's acquisition of scientific information and facts by focusing on giving him a sense of science and thinking about the future.

Starting with primary school students because it is an important stage and a basic breakthrough in the world of research and investigation, and accordingly, the researcher reviewed the material to be taught in English for the sixth grade of primary school and they noticed that it is full of useful and valuable information that expands the student's ways of thinking and helps him to have a scientific sense, but on the other hand, after visiting many primary schools, the researcher noticed the insistence of English language teachers, to focus on the traditional way and that the English teacher is still focus of the educational process, while the student is the passive recipient, except rarely, and this was the reason for neglecting the sensory and emotional aspect and thinking of all kinds among students in the primary stage.

All of this prompted the researcher to formulate the study problem with the following question: (What is the impact of the snowball strategy on the scientific sense and future thinking of sixth grade students in English language?)

The Importance of the Study:

Our current era is characterized as the era of science and technology as a result of scientific progress, which included areas of life in general and the field of education in particular, as various sciences and their applications have become one of the necessities of this progress, so the need to pay attention to the field of education has increased by providing learners with information, facts, scientific concepts and developing their ways of thinking to be able to understand the environment around them. A sense of its importance and preservation through the sound scientific method (Younis & Mohammed, 2019: 13–14) (Al-Khafaji, 2013: 4) It also highlights the importance of the developments that have occurred in the field of practical education in recent years to shift the trend from the teacher being the focus of the educational process to looking at the learner as the driving tool of the

learning process and the focus of it, considering that the learner is the final product through which the educational goals are achieved, to the extent that the learner possesses the knowledge, experiences, skills and positive trends inherent in his personality of all kinds, the judgment is on the quality of the educational process and the educational system as a whole.

Abu Shama (2011: 75), said that ministry of education has an important responsibility to keep pace with this continuous scientific and technical progress and the ability to adapt successfully to the rapid changes imposed on any society, and work to develop and modify the experiences of individuals, refine their talents, arouse their motivation, explode their intellectual energies and enrich their thinking. It also targets comprehensive and parallel numbers in all spiritual, mental, physical and social aspects, so that one side does not overwhelm the other, so that they are useful members of themselves and their society happy in their lives. (Sweidan and Haidar, 2018: 33) it is noted that most countries pay great attention to the primary stage, allocate a lot of funds to it and direct studies, research and plans to serve it. In order to be progress in the understanding of English, it is necessary to devote modern methods that are more objective in the study of various phenomena. It is based on scientific thinking methods that are based on scientific observation and experimentation, which causes its development in all scientific and cognitive fields, as well as providing a great deal of objective knowledge and expertise that is characterized by accuracy and the possibility of generalization and use for the benefit of human life. (Zghoul, 2003: 16).

Since this stage is one of the important stages, as it is the basis for the subsequent stages, the stronger foundation, the more robust the educational system will be to meet the requirements of the times, so it is necessary to pay attention to this stage by making learners know a lot

about their daily lives and what is happening in their environment, and working to develop their tendencies towards knowledge, experience and discovery, as it makes them play to practice mental processes that will enhance their learning, and thus prepare enlightened generations capable of adapting to the developments of science in every era (Al-Azzawi, 2003: 4).

One of the basic materials that learners need at this stage is English, as it contains a lot of information that was used to answer questions and inquiries that revolve in their minds, as well as information that explains the world in which they live. English curricula for the primary stage were prepared on the basis of integration, which does not separate between English within the teacher and life problems outside it, that is, taking the environment in a pivotal direction and human in a pivotal direction the interaction between them is a material and a method (Raji, 2003: 4) Specialists in English curricula and teaching also emphasize that English teaching is no longer just about transferring scientific knowledge to learners, preserving and retrieving it, but rather a process concerned with revitalizing the previous knowledge of learners, and building, understanding and retaining knowledge, with the aim of developing learners (mentally,Intellectually and skillfully), and the integration of his personality in various aspects and in a personal–social context to achieve scientific culture in science, Mathematics and Technology and the integration of his personality in its various aspects and in a personal–social context to achieve scientific culture in English, science, mathematics and technology (Zeitoun, 2007: 21). Recently, attention has been directed towards using more effective methods in the educational process, represented by learning methods that require positive learners and their activity. It is a prerequisite for the learning process, as the teacher's job is no longer limited to providing learners with scientific facts, but goes beyond them to developing various skills,

training in observation, and acquiring concepts, trends, and thinking styles in a more specific way (Attallah, 2002: 5).

The twentieth century has witnessed many educational strategy designs built on the foundations and assumptions of behavioral, cognitive, social, or human theories, in dedication to educational efforts aimed at developing the process educational based on solid scientific foundations based on behavioral, cognitive and social configurations And humanity, which had an impact on teaching, and had results, the most important of which was to confirm the maintenance of active interaction with the learner, and to measure his progress towards achieving his goals in recognizing the effectiveness of education in order to improve its practice in the future, and to achieve learning among learners (Al-Zind, 2004 : 113).

The snowball strategy is one of the most important strategies for effective and active learning that allows students to think about their own responses to a specific educational issue and to start the process of educational cooperation with those around them to consider their ideas about the same educational issue. It represents a useful way to encourage less interactive students To share ideas in pairs and then larger and larger groups to ensure the circulation and sharing of ideas among students and to distinguish between right and wrong and to self-correct errors before discussing and confirming their validity by the teacher in the classroom, and it also leads them to consensus in the entire class without complet group discussion of the class ,After all, the class will be divided into two parts and then they will communicate information about a specific scientific topic or discovery. (Schwein, 2019: 36).

Certainly, through this strategy, the teacher will discover many of the skills, abilities, and educational abilities that his students possess, including scientific sense and future thinking, which are essential

features for learners that make it easier for them to study language and. Obtaining important practical information in the right way. Both of these features are connected to the learners and it is the duty of the science teacher to focus on them to ensure that the learners get the scientific pleasure in discovery and experimentation and to reach scientific facts and concepts on their own to be firmly established in their minds in the future and to have a solid scientific base from which to get more information, facts, concepts, principles and theories Scientific sound. (Researcher).

Focusing on acquiring the scientific sense of learners from a young age will help them to address the tasks assigned to them and solve problems better and faster, and then their impact extends throughout their lives, so that the learner can intentionally modify and overcome the shortcomings in their mental performance, which develops the learner's perseverance, responsibility, independence and deliberation, and gains self-confidence, self-esteem, accuracy in performance and cognitive perception. The ability to make the right decision in different life situations (Al-Shahri, 2011: 18).

Scientific sense is also one of the finest mental activities that a person practices in his daily life naturally when faced with a problem, but these practices differ from one person to another according to his mastery of his skills that he has already learned. Scientific sense practices are like the rest of the other life practices that a person learns and practices until he reaches a level of accuracy, mastery and flexibility in facing situations Multiple tasks and the speed of completion of the required tasks. (Hussam Al-Din, 2013: 1).

If the practice of scientific sense is like the rest of the various life practices that the child learns and practices until he reaches the level of mastery, accuracy and flexibility to face multiple situations, and increase his speed in completing the tasks required of him and these practices

depend on the existence of scientific sense and have an impact in the cognitive, emotional and skill fields. The learner has mental performances, and when these mental performances occur repeatedly, these practices are usually permanent mental in the individual (Al-Zaim, 2013: 67).

In addition, we need to identify a sound and positive thinking trend among learners by emphasizing teaching them thinking skills and methods that represent their thinking in certain ways. at the end, we need to evaluate students as an important and essential part of evaluating the educational process as a whole. (Kimberly & Hyerle, 2011: 7-8).

While Spner and Mack (2008) emphasize the importance of teaching future thinking skills to learners by adopting a future problem-solving model that helps them to seek non-traditional collaborative creative solutions and to form positive attitudes about their problem-solving abilities.

These skills help them to predict and anticipate based on critically analyzing the current situation, understanding and solving it in a correct way, developing this solution and making plans to implement it, as well as providing them with a set of techniques and practical skills that help them face similar future problems in an effective way The future writer (Styron 1997) believes that society in general and the educational system in particular need to realize quickly the importance of future thinking, and take appropriate initiatives and measures necessary for its education. Myers (1999) also believes that thinking about the challenges of the future represents a broad way to learn how to sense scientific problems, identify challenges and seek for solutions to them, through effective learning strategies, and through creative thinkers who are not traditional, who embrace the idea that creative solution to problems is the only way to come up with unique, new and effective

ideas and solutions, which Myers consider the future thinking and important manifestation in which degree of cultural and intellectual sophistication in any society is measured, and this good thing here is that future thinking becomes intellectuam repetition that individual aquaires from his community (Abo Safia, 2010 : 6–7).

Based on the above, the importance of the study can be determined by several basic points, the most important of which are:

1. The primary stage is an important stage in developing learners' abilities to think, rely on themselves, raise their awareness and monitor their ideas.
2. At the present time, interest has increased greatly in the modern strategies used in the classroom, which emphasizes effective learning to keep pace with the development in the educational process.
3. It is possible for those interested and researcher in the field of educational and psychological sciences to benefit from teachers and students graduate studies from the results of the current study.
4. There is no previous Iraqi study, to the best of the researcher ' knowledge, that dealt with the snowball strategy and its impact on the sense scientific and future thinking among students of the sixth grade in English language.
5. Teaching should go beyond the traditional methods used in schools, especially since there is a significant change in english language curriculum to be taught in all Iraqi governorates.

The Aim of the Study: The study aims to identify:

(The Impact of Snowball Strategy on Scientific Sense and Future Thinking among Sixth Grade Primary Students in English language).

The Study Hypotheses:

To achieve the study goals, the researcher developed the following two null hypotheses:

1. There is no statistically significant difference at the level of significance (0.05) between the average score of the students of the experimental group who studied using a snowball and the average score of the students of the control group who studied according to the usual method of scientific sense.

2 .There is no statistically significant difference at the level of significance (0.05) between the average score of the students of the experimental group who studied using a snowball and the average score of the students of the control group who studied according to the usual way of thinking about the future.

The Study Limits:

The current study is limited to:

1. Students of the sixth grade in the public daily schools of the General Directorate of Education in Nineveh.
2. The second and third units of the English language textbook approved by the Iraqi Ministry of Education, General Directorate of Curriculum for the Public (2018).
3. The first semester of the academic year (2019–2020)

Defination of basic terms:

Snowball Strategy: Defined by:

Al-Shammari (2011): "An educational strategy used in the preparation phase to discover previous concepts and experiences before the beginning of the lesson, and also used to implement certain activities during the lesson" Al-Shammari (2011: 58).

Wald and Michael (2000) as a modern strategy that increases the volume of information required through dialogue and discussion regarding the individuals who can apply it with Different subjects start at the teacher's request who asked him to answer a question he asked them and give them a certain period to think about the answer, used in the preparation phase of the lesson to discover their previous

information or during the process of lesson explanation Walds Michael (2000: 91).

Procedural definition:

A strategy that includes a set of procedural steps, which is to identify one of the group's students by providing the answer they reached after determining the topic by the researcher for the experimental group, and according to plans prepared by the researcher for this procedure

Scientific Sense: define by :

1. **Hussam Al-Din (2013):** "The learner's awareness of the knowledge he has acquired, the processes in his mind, his ability to express his thoughts and mental performance, and the mental effort exerted in a way correct". (Hussam Al-Din 1:2013).

2. **Al _Zaim (2013):** "Mental activities practiced by the learner in a cognitive and emotional way based on emotion awareness and awareness, in order to achieve the goal" (Al-Zaim, 2013: 61).

Procedural definition:

The researcher defined scientific sense procedurally as the use and practice of mental activities in an emotional and cognitive manner based on awareness, perception and sensation in order to achieve goals and make judgments. It is measured by the total degree of response of sixth grade primary students to the tool prepared by researcher for this purpose.

Future thinking: was defined by Al-Safouri and Omar (2013): The process that is based on understanding and perceiving the development of the event and events from the past through the present to a future time span to know the direction and nature of change, depending on the use of various information about the present, analyzing it and benefiting from it to understand the future. (Al-Safouri and Omar 2013: 47)

Procedural definition:

It is a set of processes based on understanding and perceiving the development of events and facts from the past through the present to a future period of time to know the direction and nature of change based on the use of various information in the present and analysis and specifically to understand the future. The answer is measured by the total score of the sixth grade primary students on the scale prepared by the researcher for this purpose

Theoretical Background:

The researcher reviews in the theoretical background the independent research variables (snowball strategy) and the subordinate (Scientific Sense and Future Thinking)

First: Snowball Strategy

La Nada, the owner of the snowball strategy, introduced his procedural educational system based on judgment and control. He views the learning process as a self-learning process, in which the learner controls the external stimuli and controls them in a way that ensures the achievement of the desired educational goals, and confirms that the main goal of the education process is to reach the stage of self-control. The learner, from his point of view, is the person has The ability to direct his behavior and mental processes towards the educational goal of meeting himself and confirms that there are two ways in which the learner performs actions and discovery (Khalifa, 2014: 304); (Al-Hashemi and Al-Dulaimi, 2008: 215).

The principles followed by the snowball strategy:

- Teaching exploratory organization methods is more important than teaching knowledge and teachers should be familiar with two methods or procedures.
- Procedures can be learned by processing and presenting data.
- Teaching students how to discover methods is more important than presenting the formulas of these methods in a ready manner.

– Dismantling methods for small processes that serve the level of all students. (Landa 1976 : 11)

Steps to Implement a Snowball Strategy:

The strategy required the following when implementiong

1. The teacher asks an open question to his students.
2. Each student is asked to answer individually and register their answers.
3. The teacher divides the students into two groups to share the answers.
4. The teacher asks all students to answer the question bilaterally and discuss.
5. After the specified time ends, each group participates with another group to address ideas.
6. After the end of time, the Quartet participates with another quad group to address ideas. Thus, until the class is divided into two groups of students consisting of (16) a student to reach reasonable and correct answers, and each group chooses a student who represents it in order to give the final answer and so on. (Kazem, 2016: 252)

Second: Scientific Sense

Scientific sense is the replacement of common sense (Common Sense) for learners, which explains learners through phenomena based on common public thinking and from their point of view of scientific sense (Scientific Sense), which is based on the skills of investigation and inference and following scientific methods to reach the interpretations (Besson, 2004: 133). (Ford, 2012) said that thinking about making meaning in the light focus on scientific practices and patterns of of dialogue and discussion in the light of communication and representation, which Makes these practices bitter and easy. (Ford, 2012: 211) citing (Zahir, 2016: 42)

Aspects of scientific sense:

scientific sense includes several aspects that fall into two areas, namely the cognitive field and the emotional field explain as follows.

First, the cognitive field:

which includes:

1. **Ability to recall experiences and relate them to the present** Ability to extract knowledge or experience gained from past knowledge, and employing it in other life circumstances and situations.
2. **Numerical sense:** It is a set of ideas such as the meaning of numbers, ways of representing numbers, and the relationship between numbers, the relative size of the number and the skill of dealing with numbers.
3. **Activating the majority of senses** do as the use of sensory path with the vigilance and attention of collecting information and absorbing the components surrounding the environment, and all information enters the brain through the path of the senses. The teacher must plan the activity so that more opportunities are available to use of the senses because the greater the number of senses, the greater the amount of learning.
4. **Thinking above thinking:** is knowledge of the activities, mental processes, learning styles, and self-control that are used before, during, and after learning, to remember, understand, plan, manage and solve problems (Salahuddin 2017 : 32-34).

Second: The Emotional Field:

1. **The love of scientific inquiry:** It is a self-motivated thinking.
2. **Mental vigilance:** is high concentration and attention intensity.
3. **Enjoing scientific work:** rejoicing to the existence of the ability to solve problems, fun in facing the challenge in problems, and the pursuit of dilemmas that others may have and benefit to find solutions to them, and continue to learn for life.

4. **Perseverance** commitment to the mission assigned to the individual, and continuing to focus on it with attention until its end without surrender.

5. **Control of recklessness** be careful in solving problems and thinking before taking the solution, and preparing an action plan before starting the task (Al-zaim 2013: 71–73).

Third: Future Thinking

The term thinking is related to the value of the human brain and its function in terms of cognitive processes and mental activity in addressing a specific situation, and scientists and theorists have worked hard in education, psychology, etc. in finding a number of definitions of thinking that focused in its general aspects on that idea, and among the most prominent of these definitions is the definition of the American Turk dictionary that Think of understanding an act, practice, or how to make Decision, or description of ideas and talk about them before they happen and expect their results (Ammer 2011: 95).

Future thinking skills:

The classifications have multiple skills of future thinking, which were presented by many Arab literary or foreign studies, the researcher adopted the classification of Al –Hafiz (2015), which is as follows:

1– The skill of expectation: It is the skill that the individual uses to predict the results of the actions, the emergence of things, the formation of the image for next events on the basis of the past experience, as for the students it represents thinking about what will happen in the future.

2. Prediction skill: It is the skill that is used by someone who thinks about what will happen in the future.

3. The skill of solving future problems: "which is the skill that is used to analyze and develop strategies it aims to solve a difficult question, a complex situation, or a problem that hinders progress in an aspect of life".

4. The skill of future imagination: "During which the teacher is giving examples of realistic problems and finding creative solutions for these problems, according to the available data and capabilities

5. The skill of future planning: "During which the learners are trained on how to prepare a clear plan for the future, the stages it goes through to the occurrence of development in its future matters". (Al –Hafiz, 2015: 125)

Previous studies:

The researcher decided to review one study on each of the study variables, because the experimental studies the researcher obtained in various specializations from the current study specialization, as follows:

1. (Al–Rikabi, 2016) Study:

The study was conducted in Iraq and aimed to identify the effectiveness of a strategy that rolling the snowball in the collection of an animal and scientific thinking among students of the Department of Life Sciences. The size of the study sample (43) male and female students from the fourth stage students in the Department of Life Sciences were divided into two groups experimental group and the other control group. The experimental group was taught according to the snowball strategy and the control group according to the traditional method. The researcher prepared an achivement test consisting of (40) paragraphs (25) objective (15) articles and a scale for scientific thinking consisting of (50) paragraphs characterized by realiblity and validity, and the data was statistically processed using the T– test and (SPSS) The results of the study showed the superiority of the experimental group that was studied according to the snowball strategy on the control group that studied according to the tranditional method in achievement and scientific thinking.

2. (Zahir, 2016) Study:The study was conducted in Iraq and aimed to identify the effectiveness of the integrated learning strategy and the

active thinking model in the achievement of the fourth grade students with physics and their scientific sense), as the size of the study sample reached (106) students from the fourth grade students, who were divided into three groups, two experimental groups and other controlled, The researcher is prepared a achievement test consisting of (49) objective paragraphs, and the scale of the scientific sense was built of (71) paragraph equally distributed on the aspects of the scientific sense, characterized by realibility and the data was statistically processed using (unilateral contrast analysis, a chef test, and by using the statistical bag program for social sciences SPSS version 20, And the 2010 Microsoft Office Excel program). The results of the study showed the effectiveness of both the integrated learning strategy and the active thinking model compared to the traditional way in the scientific sense and the achievement of students of the fourth grade of scientific (research sample) with physics.

3. (Abu Musa, 2017) Study:

The study was conducted in Palestine and its aim was to design an electronic educational environment that employs active learning strategies and measuring its effectiveness in developing future thinking skills in technology among the seventh grade students), as the sample size was (70) a student of the seventh basic grade students. They were divided into control and experimental groups, the researcher prepared ascale for future thinking consisting of (20) a paragraph, characterized by realibility and validity, and the data was statistically processed using (the Kyuds Trendson – 21, Test (T) Test, ITA box, the earning rate for Black) The results of the study showed the effectiveness of the electronic learning environment in developmentFuture thinking skills in favor of the experimental group.

After reviewing the previous studies, the researcher came out with several indicators and as follows:

1. Study aim:

The study (Al –Rikabi 2016) aimed at knowing the effectiveness of the snowball strategy in variables such as achievement and scientific thinking, while (Zahir 2016) study aimed at identifying the effectiveness of the integrated learning strategy and the model of thinking about achievement and scientific sense, while the study of (Abu Musa 2017) aimed to know the effectiveness of the electronic environment in Future thinking skills. The current study aimed to know the impact of the snowball strategy in scientific sense and future thinking.

2. The study tool:

In previous studies, the researcher used various tools prepared by them, while the current study has adopted the scientific sense and future thinking prepared by the researcher.

3. The sample:

Previous studies also relied on different samples in the number ranged between (43–106), the basic and university academic stages, and gender is male and female. As for the current study, it applies to the sixth grade students, who number (68) students.

Study procedures:

First / experimental design: The researcher used the experimental design of the two equivalents experimental and control groups.

Second / Study sample: The study sample was formed from (78) a student of the sixth grade primary students at the Koufa Al–Namothageia School for Boys, which is located in the Al –Zahra quarter on the left side of the city of Mosul, Iraq. After excluding the students who failed from the sample, the size was (68) pupils, at the rate of (36) pupils in the class (A) and (32) a student in class (B), and accordingly, the class (A) will represent the control group, while the class (B) will be the experimental group, the appropriate number of students to teach the snowball strategy.

Third / Equalization of the two groups: After selecting the two groups intentionally and before starting the application of the experiment, the researcher conducted the equalization between the two groups in the variables of (the age accounted in months, the general average of the primary grade of the academic year 2018– 2019, the degree of English language for the fifth primary grade of the academic year 2018 – 2019).

Table (1) explains this:

Table 1

The results are equivalent to the two groups in variables

Variables	Groups	Number	Average arithmetic	Standard deviation	T– test	T– tablet
Age calculate by months	experimental	32	128.531	9.0979	0.25	2.006 at the level of significance 0.05 and the degree of freedom (66)
	control	36	128.472	10.205		
General average of subject for previous year	experimental	32	635.963	91.4568	0.734	
	control	36	651.222	80.6173		
English digree	experimental	32	71.6875	17.4826	0.874	
	control	36	75.111	14.8319		

It is clear from the table (1) that the T– calculated and calculated value for all variables are less than the tabular value of (2.006) at the level of significance (0.05) and the degree of freedom (66) and accordingly, the two groups are equivalent to the variables of equivalent.

Fourth / Study Supplies:

After the school's visit to implement the study and the determination of the scientific material to be taught during the experiment period, two models of the teaching plans of both experimental groups that are taught using the snowball and control ball strategy that are taught

according to the traditional method are prepared, then it was presented to a committee of experts in the specialty of Educational and psychological science, and experts have expressed their opinions on the authority of typical plans and no amendment was made by them, and thus the plans are ready for the application to be taught to the two groups by the English language teacher in the school.

Fifth / Study Tools: The researcher has seen many tools, standards and tests related to the study variables (scientific sense – future thinking that suit the current study sample and its application to the Iraqi environment, otherwise they did not find the suitable tool, so the researcher decided to built two tools to achieve the research goal, and test it's hypothesis and as follows:

A– The first tool / scientific sense tool: The researcher built the tools of the scientific sense of the sixth grade students, which were formed in its initial form on two aspects: the cognitive aspect and the emotional side, the cognitive aspect is from (16) imaging test paragraph in the form of a multiple choice but the emotional side is represented by a scale consisting of (25) imaging paragraph also with triple alternatives (located in a large degree, located on a medium degree, does not apply to me), as well as the tool was formed from (41) paragraph, all of which are supported by pictures, and to ensure the validity of the tool, the researcher did the following steps:

Expert names:

Prof. Dr. Fadel Khalil Ibrahim – Education for a basic college / Mosul University

Asst. Prof. Dr. Fathi Taha Meshaal – Elementary College Education / Mosul University

Prof. Dr. Youssef Faleh Muhammad Al –Saadi – Education of an Essential College / Mosul University

Asst. Prof. Dr. Iman Mohamed Sharif – Education in a basic college / Mosul University

Prof. Dr. Abdul Razzaq Yassin Abdullah – Education for Humanities / Mosul University

Asst. Prof. Dr. Haider Abdul Karim Mohsen – Anbar Education Directorate

Prof. Dr. Raed Idris Mahmoud Al –Khafaji – College of Education for Girls / Mosul University

Asst. Prof. Zina Taha Hassoun – College of Basic Education / Mosul University

Prof. Dr. Muhammad Jassim Abdul Amir – College of Education for Pure Sciences, University

Asst. Prof. Bushra Khamis Muhammad – College of Basic Education / Mosul University

Asst. Prof. Dr. Faiza Ahmed Jassim – College of Basic Education / Mosul University

Asst. Prof. Khawla Ahmed Mohamed Saeed – College of Basic Education / Mosul University

Asst. Prof. Dr. Anwar Qasim Yahya – College of Basic Education / Mosul University

Asst. Prof. Ghosoun Khaled Sharif – College of Basic Education / Mosul University

Asst. Prof. Dr. Amal Fattah Zidan – College of Education for Pure Sciences / Mosul University

1. Virtual reliability: The tool was presented to the above-mentioned expert committee for the purpose of demonstrating its validity for application to the members of the study sample, and no paragraph was modified or deleted, and thus the researcher has verified its virtual reliability.

2. The survey application for the tool for the purpose of conducting the survey application of the tool. The researcher chose the sixth grade students in the schools of Sharhabeel and Al-Biareq the two primary schools for boys who are in the Al -Zahra quarter – the left side of the city of Mosul, who number (110) a student to be the samples of survey application individuals and after agreement with the school administration took place Applying the scientific sense tool to them on Monday (2 – 12 – 2019), and after correcting the students answers for to the tool by giving the paragraphs in the cognitive field grades) (0–1), while the answers in the emontional field were given the grades (1,2,3) upon correction, and accordingly the degrees of the answer to the tool ranged between (25 –91) and when calculating the time taken to answer the first two students and the last two students, collect it, and divide the result by (4), it was found that the time required to answer the tool is (40) minutes.

3. Calculating the discrimination force of the tool paragraphs for the calculation of the discriminatory force. The researcher arranged the answers of the students descending and then dividing them into two groups and adopting (50%) higher category and (50%) a minimum category, and the number of students (55) in both categories reached, and by using the two independent sumples tests that it was found that the factor of discrimination of the pargraphs it range between (0.31 – 0.62), as for its difficulties, it ranged between (0.20 – 0.78), thus the paragraphs are all acceptable in terms of discrimination and difficulty, and then no paragraph of the scientific sense tool has been deleted.

4. The validity of the tool: The researcher used the method of re-testing to find the validity of the tool, in order to suit this method with the nature and paragraphs of the tool, by exposing a group of pupils (Al –Qaqaa Elementary for Boys, who number (50) students for the first test on Wednesday (4-12-2019) and re-test for them for the timeThe

second on Wednesday, the coincidence (18-12-2019), and by using the Person correlation coefficient between the two times of the test, it was found that the validity of the tool reached (0.83), which is a good validity coefficient, and thus the tool is ready to apply on the main research sample.

B- The second tool / future thinking scale: The researcher built a measure of future thinking based on previous literature and studies, which are in its initial form of (30) a paragraph of the three alternatives (applies to me in a large degree, applies to me to a moderate degree, does not apply to me) the grades have been given (1,2,3) the level of measurement in its initial form ranges between (30 – 90) degrees, and to ensure the validity of the scale, the researcher made many procedures as the following:

1. The virtual reliability : The tool was presented to the Experts Committee, which the researcher previously presented teaching plans and a tool (scientific sense on it), to know their opinions about the validity of the scale (future thinking), and all the vertebrae of the scale obtained the incidence rate of more than (85) and no paragraph of its paragraphs has been deleted or modified.

2. Servuy application of the scale: The researcher conducted the exploratory application of the scale of future thinking on the same group and on the same day from the date of application of the scientific sense tool for the purpose of knowing the appropriateness of the paragraphs of the scale with the calculation of the time required to answer which is only 30 minutes.

3. Calculating the discriminatory force in the same way as calculating the discriminatory force of the scientific sense. The discriminatory force vertebrae was calculated as a measure of future thinking and it became clear that the force of discrimination of the paragraphs ranged between (0.30 0.56) As for the coefficient of its

difficulties, it turned out that it ranges between (0.45 0.73) and accordingly, no paragraph of its paragraphs has been deleted from the scale.

4. The validity of the scale: the researcher used the Koder Richard Sun's 21 equation, to suit the scale paragraphs after presented the scale at (50) pupils from the students of Al –Qaqaa Primary School for Boys are the same as the set of validity of the scientific sense tool, on Wednesday (4/12/2019), to find validity, which shows that it reaches (0.85) and is a validity coefficient good, so two tools are ready to apply for the application for the sample after the experience is finished.

Sixth / implementation of the experiment: English teacher at Kufa Al–Namothegeya School for Boys (basic study sample) the actual experience apply after the stability of the situation and continued work in the schools of Mosul and the completion of study procedures, achieving equivalent between the two groups, on Thursday (5/12/2019) and continued (6) realistic week by (5) classes each weeks and ended by exposing the two groups (experienceAnd the control of the post–test) on Wednesday (15/1/2020).

Seventh / Statistical Means: The Researcher used to analyze statistical data using the statistical package system for educational and psychological sciences (SPSS), the Koder Richardson –21 equation and the probability size equation.

Presentation and discussion of the results:

After obtaining the answers of the students to the research tool, the data was analyzed statistically according to the two research hypotheses, it will be presented and discussed according to the following:

First / The result of the first zero hypothesis which states that:

"There is no statistically significant difference at the level of significance (0.05) between the average grades of the experimental group students

who studied using the snowball strategy and the average grades of the control group students who studied according to the regular way in the scientific sense."

For the purpose of verifying the validity of the hypothesis, the researcher extracted the arithmetic average, standard deviation, and the calculated value (T-test) of the students in the two groups. The results were included in the Table (2) and as follows:

Table (2) The average arithmetic, standard deviation, and the calculated value of the grades of the students of the two groups in the scientific sense

Groups	Number s	Arithmetic average	Standar d deviation	T-value		Level of significance
				T- test	Tabula r	
experimental	32	80.218	7.974	4.401	2.006	Statistically at a significant level of 0.05 and degree of freedom 66
control	36	65.666	17.114			

It is clear from the above schedule that the calculated T-value reached (4.401), which is greater than the tabular value (2.006) at the level of significance (0.05) and the degree of freedom (66), and this means that there is a statistical difference between the two groups in favor of the experimental group and this rejects the first zero hypothesis and accepts the alternative hypothesis

Second / The result of the second zero hypothesis which states that: "There is no statistically significant difference at the level of significance (0.05) between the average grades of the experimental group students who studied using the snowball strategy and the average grades of the control group students who studied according to the traditional way in future thinking".

After analyzing the data statistically and finding the arithmetic average, standard deviation and calculated T-test value, for the purpose of

verifying the validity of the second hypothesis, the results were included in the table (3) as follows:

Table (3) The average arithmetic, standard deviation, and the second value calculated for the degrees of students of the two groups in thinking future

Groups	Number s	Arithmetic average	Standard deviation	T-value		Level of significance
				T-test	Tabular	
experimental	32	81.437	5.223	4.248	2.006	Statistically at a significant level of 0.05 and degree of freedom 66
control	36	68.527	16.456			

The average arithmetic, standard deviation, and the calculated value of the grades of the students of the two groups in the Future Thinking Table (3) shows that the T-calculated value amounted to (4.248) which is greater than the T-Tabular value (2.006) at the level of significance (0.05) and the degree of freedom (66), and this means that there is a statistical difference between the two groups in favor of the experimental group, this rejects the first zero hypothesis and accepts the alternative hypothesis. To find out the size of the effect of the snowball strategies on the dependent variables (scientific sense, future thinking, the results included in the table (4) and as shown in below:

Table No. (4)

Dependent variable	Factor	Calculated value	Criteria			Effect
			Small	Medium	Large	
Scientific sense	ita square	0.2268	0.01	0.06	0.14	large
	effect size	0.8502	0.02	0.05	0.8	large
Future thinking	ita square	0.2147	0.01	0.06	0.14	large
	effect size	0.7845	0.02	0.05	0.8	large

It is clear from the above table that the size of the impact for the snowball strategy in the dependent variables (the scientific sense, future thinking) was great by comparing the value calculated with the criteria set by (Cohen 1988), in favor of the experimental group. Thus, the results of this research consistent with the results of all previous studies.

The researcher attributes this to the accurate scientific steps of this strategy and its suitability for primary school students in general and sixth –grade primary students in particular, which made the student a focus of the educational process through obtaining, discovering and analyzing scientific information and facts based on his previous experiences then comparing it with the information and facts that others possess and confirm, modify it or even add to it, it had a great impact in the accuracy of information and its importance to possess a scientific sense and a proper future thinking that serves the student inside and outside the class to be an effective element in society and this is focused on the strategy in addition to giving students skills and other cognitive and practical possibilities.

Conclusions, recommendations proposals:

First / The conclusions: The researcher came out and based on the results of the research with many conclusions, the most important of which are:

1. The effectiveness of the snowball strategy and its preference for the traditional way of scientific sense and future thinking of the sixth grade primary students because it creates an atmosphere of familiarity and cooperation with each other.
- 2– The possibility of teaching this strategy in teaching English subject because it emphasizes the discovery of information and verifying its authenticity, not to impose on it.

3. The students desire increased the process of learning English subject, which facilitated the process of obtaining information and knowledge and its diversity for them, which made the teaching of english a fun and effective lesson.

Second / Recommendations: The researcher recommend as follows:

1. The necessity of adopting primary teachers and teachers in their teaching on modern educational strategies in general and the snowball strategy in particular.
2. Holding extensive development courses by the university's teachings in the ministries of higher education and education for male and female teachers in primary schools to teach in accordance with modern strategies and focus on effective teaching.
3. Focusing on making the student the focus of the educational process by focusing on providing him with the ability to discover and develop his general scientific information and with the guidance and guidance of teachers only.
4. Focusing on providing students with a scientific sense and future thinking in the lesson of English by adopting classroom and no classes designed by English teachers and not focusing on preserving and memorizing scientific information by their students.

Third / Suggestions: Complementary for the current study, researcher suggest the following

- 1- The effect of the use of a snowball strategy in scientific sense and future thinking among students at various other educational stages.
- 2- The effectiveness of the snowball strategy in collecting fifth grade students and developing their obstetric thinking.
- 3- Comparing education strategies in developing future thinking among students of the Faculty of Basic Education at Mosul University.

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