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INVESTIGATING THE IMPACT OF TEACHING WITH BRAINSTORMING AND ITS ROLE IN DEVELOPING STUDENTS' INTELLECTUAL SKILLS

CASE STUDY OF MASTER ONE STUDENTS AT CHADLI BENDJEDID UNIVERSITY, EL-TARF

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Abstract

English as a foreign language (EFL) teachers are usually looking for new strategies and various ways to motivate their students as well as to improve their skills and to run the class session into something more beneficial. One of those different strategies is brainstorming which plays an essential role in developing students' intellectual skills. This study aims to investigate the impact of teaching with brainstorming and its role in developing students' intellectual skills. This qualitative and quantitative thesis is conducted at the department of English at Chadli Bendjdid University, El Tarf through descriptive method in order to confirm our hypotheses. Therefore, data were collected through two questionnaires submitted to 30 Master one student and 10 teachers of the same department. The questions were raised to shed light on students' perceptions toward the positive use of brainstorming in solving problems and generating ideas and its effectiveness on EFL students' thinking development during sessions. The result obtained from students' and teachers' questionnaires confirmed that brainstorming is important strategy in learning and teaching process. It also showed that it has an impact in enhancing students' intellectual skills. The current study ends up by provoking some suitable recommendations that would highlight the impact of brainstorming in improving students' intellectual skills.

Key Words: Brainstorming Strategy, Intellectual Skills, Thinking, EFL Students, EFL Teachers.

الملخص

يبحث مدرسو اللغة الإنجليزية كلغة أجنبية عادةً عن استراتيجيات جديدة وطرق مختلفة لتحفيز طلابهم بالإضافة إلى تحسين مهاراتهم وإدارة جلسة الفصل في شيء أكثر فائدة. إحدى هذه الاستراتيجيات هي العصف الذهني الذي يلعب دورًا أساسيًا في تنمية المهارات الفكرية للطلاب. تهدف هذه الدراسة إلى معرفة تأثير التدريس باستخدام العصف الذهني ودوره في تنمية المهارات الفكرية للطلاب. تتم هذه الرسالة النوعية والكمية في قسم اللغة الإنجليزية بجامعة الشاذلي بن جديد بالطرف من خلال المنهج الوصفي لتأكيد فرضياتنا. لذلك تم جمع البيانات من خلال استبيانين مقدمين إلى 30 طالب ماجستير و 10 مدرسين من نفس القسم. تم طرح الأسئلة لتسليط الضوء على تصورات الطلاب تجاه الاستخدام الإيجابي للعصف الذهني في حل المشكلات وتوليد الأفكار وفعاليته في تنمية تفكير طلاب اللغة الإنجليزية كلغة أجنبية أثناء الجلسات. أكدت النتيجة التي تم الحصول عليها من استبيانات الطلاب والمعلمين أن العصف الذهني هو استراتيجية مهمة في عملية التعلم والتعليم. كما أظهرت أن لها تأثيرًا في تعزيز المهارات الفكرية لدى الطلاب. تنتهي الدراسة الحالية بإثارة بعض التوصيات المناسبة التي من شأنها أن تسلط الضوء على تأثير العصف الذهني في تحسين المهارات الفكرية للطلاب.

الكلمات المفتاحية: إستراتيجية العصف الذهني ، المهارات الفكرية ، التفكير ، طلاب اللغة الإنجليزية كلغة أجنبية ، معلمو اللغة الإنجليزية كلغة أجنبية.

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Dedication

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To all the members of the familly

To my two dear besties ***Boutheina and Bouchra***

To all who tought me a word

To all people whom I know and I love

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Ahlem

Dedication

In the name of Allah the most merciful compassionate the lord of the worlds and the prayers and peace be upon Muhammad his servant and messenger.

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To my dear parents, ***Ali & Malika****, I say it is impossible to thank you adequately for all the sacrifices that you made for me to finish this investigation, for loving me unconditionally and who have stood by my side and lighting my road by hope.*

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To every one who tought me a word

To all people whom I know and I love

Bouchra

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List of abbreviations

EFL: English Foreign Language

EMS: Electronic Meeting System

N: Number of Participants

Q: Question

CBU: Chadli Bendjdid University

%: percentage

Chapter One : Introductory Chapter to the Research Problem

Chapter one

Introduction

One of the most important skills that students need to develop in English teaching is the intellectual skills, where they able to creat new ideas and to think about a particular issue. There are some commonly used teaching strategies, such as brainstorming, can serve to stimulate creative thinking. Brainstorming strategy is one of the most effective teaching techniques to trigger students' intellectual skills and to boost their creativity and problem solving within the educational system. Simply speaking, brainstorming means the use of brain to the active problem solving and the brainstorming session aims to develop creative solutions to problems (Jarwan, 2005).

Because of the importance of brainstorming and students' intellectual skills, this research is conducted to investigate the impact of teaching with brainstorming and its role in developing students' intellectual skills. Besides, the study explores the relationship between brainstorming and intellectual skills, especially in developing students' creative problem solving skills.

This chapter exposes the statement of the problem, the aims of the study, significance of the study, research questions and the hypotheses. It also includes the used methodology which contains the research design, the participants in additions to the instruments. Lastly, also the structure of the study is presented.

Statement of the Problem

Learning English as a foreign language requires great work and efforts. It is therefore important for an EFL learner to develop his/her thinking skills to master the language. As EFL learners, we noticed that students have problems to come up with thoughts and ideas. However, brainstorming is considered as a successful cognitive strategy that can be used in

problem solving and identifying the different option and opportunities related to a particular issue.

Aims of the study

The reason behind conducting this research work is to identify the brainstorming strategy in the context of EFL learners. Additionlly, it mainly investigates the effect of teaching with brainstorming. Furthermore, it attempts to detect its role in developing the intellectual skills.

Significance of the study

The integration of brainstorming as a useful tool in classroom is taking an essential place in educational institutions. Therefore, the importance of the current study seeks to reveal the impact of teaching with brainstorming in developing intellectual skills. Moreover it increases both EFL students and teachers's awareness about the importance of the brainstorming strategy usage. In addition to its role in improving students thinking ability.

Research questions

In order to know the importance of teaching with brainstorming in developing students' intellectual skills. This study raises to answer the following questions :

Question one :

Does brainstorming affect on developing the intellectual skills?

Question two:

Is there any significant relationship between brainstorming strategy and students intellectual skills?

Question three :

What are the students and teachers' perceptions about using brainstorming as a teaching strategy?

The research hypotheses

To respond to the above research questions, let us suggest the following hypotheses:

Hypothesis one :

Brainstorming strategy helps EFL learners to improve their intellectual skills.

Hypothesis two:

If teachers use brainstorming as a teaching strategy, students' intellectual skills will be developed.

Hypothesis three :

EFL students and teachers have good perceptions and positive attitudes towards the impact of using brainstorming on EFL student' intellectual skills.

Research methodology

Research design

To validate the hypotheses and answer the research questions, the current study will follow the descriptive research methodology which is the appropriate method that tends to investigate the perception towards the positive use of brainstorming in increasing learners intellectual skills. Hence, data is gathered through the distribution of two questionnaires for both teachers and students at Chadli Bendjedid University of EL-Taref to show whether the use of brainstorming can improve students'intellectual skills.

Instruments

The questionnaire had been distributed to both participants 30 students and 10 teachers among master one from the department of English, in which the participants were asked to tick choices in the corresponding boxes and make a full statement whenever necessary concerning the presented study which investigating the impact of brainstorming strategy in developing EFL students' intellectual skills.

The participants

The participants of the study were randomly assigned among Master one students and teachers from the CBU.

The structure of the dissertation

This research is divided into five main chapters. The first chapter introduces a general overview about the topic, deals with the statement of the problem, the aim and significance of the study, the research questions and hypotheses, in addition to the research methodology followed by the organization of the study.

The second chapter, theoretical chapter, is devoted to the literature review. It consists of two parts: the first part provides a review related to brainstorming, its definition, importance, types, steps and rules. In addition to its advantages, disadvantages, stages as well as the role of the teacher during brainstorming session. The second part deals with the intellectual skills and their relationship with brainstorming.

The third chapter will cover the methodology which applied in this research. It presents the research design, participants, instrument of data collection, and research procedures. Moreover, the fourth chapter work on analyzing dada and the main findings obtained from both teachers and students. Finally, the last chapter provides the implications of the research findings and some recommendations and suggestion for further research. The thesis ends with a general conclusion to the study.

Chapter Two : Literature Review

Introduction

This chapter presents the reviewed literature related to the study. It is composed of two main sections: the first part attends to examine the concept of brainstorming including its definition, importance, types, steps and rules. In addition to its advantages, disadvantages, stages as well as the role of the teacher during brainstorming session. The second part deals with the intellectual skills and their relationship with brainstorming.

Section One : Brainstorming

Definition of Brainstorming

Brainstorming was first introduced in 1938 by an American advertisement manager called by Alex Faickney Osborn as a result of his inconvenience of traditional business meeting. The term brainstorming coined by Alex Faickney Osborn in his book Applied Imagination: Principles and Procedures of Creative Thinking, published in 1953. Since 1953, the term "brainstorming" has expanded over the world, with many different interpretations.

The term of brainstorming defined in various ways by many researchers and Scholars as Hoing(2001) defined it as the multiple thinking that includes the breaking up of old ideas, making new connections, enlarging the limits of knowledge and the onset of wonderful ideas.

According to(Jarwan,2005), brainstorming is the use of brain to the active problem solving and the brainstorming session aims to develop creative solutions to problems.

Al_Mutairi(2015) defined brainstorming as one of the most important strategies in provoking creativity and solving problems in the educational ,commercial, industrial and political fields. It combines a relaxed, informal approach to problem solving with lateral thinking.

Brainstorming can be viewed as a technique in which an individual or a group engages in critical thinking to generate wide range of ideas and creative solution toward solving a problem. This strategy is now widely applied in different fields of human endeavor including

education (Owo, Idode and Ikwut, 2016). Furthermore, Unin and Bearing(2016) stated that brainstorming is usually a small group activity which encourages students to focus on the free flow of ideas.

Baumgartner described brainstorming as ‘‘a highly effective technique for maximising group creative potential, not only to generate ideas but also to determine which ideas are most likely to succeed in a specific area of interest’’ Baumgartner (2007).

Brainstorming is a useful tool to develop creative solutions to solve problems in different fields. It involves writing down ideas as they come to mind and trying to come up with as many ideas as possible. Thus, it is one of the most effective teaching strategies to trigger student’s intellectual skills and to boost their creativity.

The importance of Brainstorming :

Brainstorming is a motivational strategy that is used in various domains, especially in educational field. It is a useful technique for generating new ideas and solutions to particular problems. It is an effective strategy in the teaching process. According to Al-khatib (2012), the main goal of brainstorming as a teaching approach is to foster and enhance communication skills, encourage thinking and decision-making skills, and foster varied ideas and opinions. Brainstorming is important for both students and teachers.

Firstly, its importance for students as stated in (Sayed, 2009, as cited in Al-Khatib, 2012) that it :

- Helps students to solve problems, an innovative solution.
- Helps students to benefit from the ideas of others through the development and build on them.
- Helps the cohesion of the students and build relationships among them and assess the views of others.

In other words, it is helpful in providing students the opportunity to share their ideas without a fear of being evaluated. It helps them to refresh and expand their prior knowledge building on each others' solutions and contributions. Further, it provokes the students' creativity and acceptance of others' ideas in a non-judgmental environment.

In the other hand, brainstorming strategy is important for teachers when referring to (Humaidan, 2005 as cited in Al-Khatib, 2012) that this strategy " Helps the teacher to conclude ideas that are broader than students' thinking solutions Makes the teacher more democratic and respectful of views regardless of the different points of view''. This means that brainstorming enables teachers to make concluding decisions upon the students' ideas. Then, they will be able to evaluate those ideas and being more appreciative about them.

This makes the teacher plays the role of guider, in which he prohibits critical comments between teammates during the exchange of ideas and emphasis on the significance of listening to conveyed thoughts between the participants. Otherwise, he may be a facilitator of the session by creating the helpful environment for participants to brainstorm and exchange thoughts in a more respectful and comfortable way.

Types of Brainstorming

Individual Brainstorming:

Individual brainstorming is an effective way as the researchers suggest in solving problems and generating ideas. It is a useful method in creative writing. (Furham&Yazdanpanachi,1995). It gives opportunity to brainstorm and create individually without worry about other's opinions. When individuals brainstorm alone, they try to solve problems with more functional solutions and better effective ideas, in which they will be able to better express themselves in a comfortable environment, where they are not going to be blocked by paying attention to others in the group.

Group Brainstorming:

Group brainstorming is one of the most effective type of brainstorming. It is a functional strategy for gathering various ideas and thoughts to find effective solutions to the issue. Brainstorming brings the experience and creativity of all members of the group to solve a problem. Whenever a member of group becing stuck on an idea, the innovation of another participant can take the idea to the next stage. As a result group brainstorming tends to generate as many ideas as possible in a particular period of time. Furthermore, it makes everyone participated feel more effective because brainstorming not only generate ideas in session but also spark off from association with other peoples' ideas by developing and testing them. Brainstorming combines lateral thinking with a relaxed, informal approach to problem solving. It requests that people come up with ideas and thoughts that may appear to be anwise at first. The impression here is that some of these ideas can be crafted into unique, creative solutions to the problem at hand, while others can stimulate even more ideas. This strategy is intended to help people get unstuck (Osborn as cited in Monica,2017). In other words, group brainstorming can be used whenever new and original solutions are needed.

Electronic Brainstorming :

Brainstorming with electronics computerized version of the manual brainstorming strategy generally assisted by an Electronic Meeting System (EMS) although, it can be done through email and may be browser based or use peer-to-peer software. In EMS, participants exchange a list of ideas via a network, these ideas are submitted individually. Contributions are usually visible to everyone and are often anonymized to promote openness and reduce personal prejudice. Modern EMS also support synchronous brainstorming session as well as usual follow up tasks in the creative problem solving process, including thought categorization, elimination of duplicates, assessment and discussion of prioritized or controversial ideas (Sekhar & Lidiya,2012). Besides, Gallupe argue that many of the

problems connected with traditional brainstorming like production blocking and evaluation fear, are eliminated by electronic brainstorming.

Nominal Group Technique:

The nominal group technique is another type of brainstorming in which ideas are generated and selected in a structured way. Thus, it motivates everyone to participate equally in the process. Participants are requested to anonymously write down their thoughts. Following that, the moderator gathers all of the proposals, and the group votes on each one. A vote might be as simple as a show of hands in favor of proposition. Distillation is the term of this process. The top ranked ideas may be presented to the group or subgroups for more brainstorming during distillation. Brainstorming groups can outperform nominal groups while given the appropriate situation (Sekhar & Lidiya,2012).

1.3.5 Group Passing Technique:

Another form of brainstorming process is group passing that involves a group of individuals working together on a problem, in which ideas are generated and shared around in a group. So, in circular group, each individual writes down one idea and then gives the piece of paper to the next person, who adds some thoughts. This process continues until everyone receives their original piece of paper. By this time, the group has gone over each concept in great detail (Sekhar & Lidiya,2012).

Team Idea Mapping Method:

This way works by association and collective creativity. It promotes collaboration and enhances the quantity of ideas generated, and it is structured up in ways that all participants engage and no suggestions are rejected. The technique starts with clear topic. Each member comes up with their own ideas, which are then integrated into a single huge idea map. Furthermore, participants might develop an understanding on the problems. The group also brings new ideas mostly during the conversations that are then added to the map. The group

can prioritize and take action when all of the ideas have been gathered (Sekhar & Lidiya, 2012).

Guided Brainstorming:

Guided brainstorming is systematic process that both individuals and groups can apply in order to solve well defined and complicated subjects. This type removes all causes of conflict and inhibits discussion while fostering critical and creative thinking in holistic and engaging environment. Innovative concepts emerge constantly, as participants are asked to follow various mindsets for a predetermined period of time while adding their thoughts to central mind map produced by a pre-designated writer. In addition, the participant appears to find easy answers that collectively create bigger progress after considering a multi-perspective view. Each process is personalized. Following a guided brainstorming session, participants ideas classified for further brainstorming, research and questions that remaining without a specific answer, and a prioritied, identified, actionable list that tends to leave everyone with a clear understanding about what needs to happen after that, and the capacity to visualize the focus of future joint and greater goals of the group appears (Sekhar & Lidiya,2012).

Directed Brainstorming:

Directed brainstorming is a different type of electronic brainstorming. This can be done manually or with the help of computers. In this type each participant is given one piece of paper (or electronic form) and told the brainstorming question. The participants are permitted to give one answer and pause, then all the papers are exchanged randomly between participants. As well they are requested to consider the idea they were provided and come up with a new one that enhances on the initial criteria. Then the models are reversed, and respondents are invited to improve on their ideas, and the procedure is repeated three or more times (Santanen, Briggs, & De Vreede , 2004).

Question brainstorming:

This type emphasizes brainstorming question instead of trying to come up with prompt answers and short-term solutions. Therefore, this strategy should not discourage participation when no solutions are required. The framework for developing future action plans is formed by the answers to the question (Ludy, 2000).

Application of Brainstorming

Steps of Brainstorming:

There are several steps to brainstorming that learners should be familiar with in order to coming up with many ideas (Osborn, 1957). The first step is to chose the right time and space for the session. Secondly, describe the problem you are trying to solve and give more explanation about the purpose of the brainstorming session. Thirdly, introduce the facilitator and for a successful session it's important to pick an appropriate person who isn't afraid to guide and who will work to ensure that everyone has an opportunity to participate. Fourthly on the last step students have to think and generate as many ideas as possible of once you have gathered the ideas you decide which ones are related to your problem and which ones aren't useful.

Rules of Brainstorming:

There are four main rules for brainstorming proposed by Osborn (1963) to reduce social inhibitions among teammates, stimulate idea generation, and increase overall creative ability. Those rules are as follows:

No criticism:

During the Brainstorming session, no criticism of ideas is permitted because the goal is to generate diverse and unusual ideas and to extend or add to these ideas. Criticism is reserved for the process's evaluation stage. This allows team participants to feel at ease with the idea of coming up with unusual ideas.

Unusual ideas are welcomed:

Because of it is usually easier to break down then to break up, and new ways of thinking and looking at the world may provide better solutions.

Quantity wanted:

During this stage, the greater the number of ideas and thoughts generated, the greater the likelihood of generating a radical and effective solution.

Combine and improve ideas:

This means that not only are a variety of ideas desired, but also methods and techniques for combining ideas to improve them (Osborn,1963 as cited in Monica,2017).

Stages of Brainstorming:

Stage one: introducing the brainstorming rules: The first stage consists of introducing the rules. By writing the list of rules on the whiteboard, we can direct the class processes. When students see the rules, they try not to deviate from the main route.

Stage two: stating the subject or problem: In this stage, the teacher should select a topic for which there are no explicit materials in the book. Students should have at least a little information about the topic. Topics about which students have no knowledge are not suitable. Also, topics which have only a few specified solutions are not suitable. In order to begin, you can give the students some concise introductory but interesting information about the topic. It is recommended that a set of thought-provoking questions be prepared for this stage.

Stage three: expressing ideas: This can be done in different ways. One way is that a person presents his/her idea and then the next person takes turns to do the same, hence a revolving current of expressing ideas.

Stage four: exhibiting ideas for combination and improvement: So far many ideas have been presented. Now ask the group to screen and refine ideas, that is, to discard repetitious,

similar, or inappropriate ones. Be careful not to discard original, creative ideas just because of being unusual.

Stage five: evaluating ideas: Now we have a number of classified ideas. Some people mistakenly believe that group brainstorming is the whole process of problem solving; while actually, it is just one of the stages of ideaseeking, the latter itself being just one of the stages of creative problem-solving (Hryrfrosh, and Sadeghi as cited in Rizi et al, 2013).

The Advantages and Disadvantages of using Brainstorming:

Brainstorming is basically a technique of decision making that can be employed in any situation where participation is needed. There are both advantages and disadvantages of this strategy.

Advantages of using Brainstorming:

Brainstorming is very useful tool that can be applied elsewhere. Besides, Buzan (1993) mentioned that one of the most significant advantages of brainstorming is that it requires almost no preparation and it can be used with classes at any level and in any situation. In addition it allows students to see their ideas on paper before they start writing (Harmer, 2001). Furthermore, brainstorming is a beneficial tool that helps learners to improve their creative abilities, in the same time it encourages them to express their creativity in thinking spontaneously without having to judge every idea that come to mind. Moreover, brainstorming gives students the chance to link between their previous knowledge and the current issue. Further, brainstorming enables students to communicate and participate in group works as well as to think about other's perspectives/opinions. In addition, it increases self-esteem and self-confidence. By brainstorming students improve the better environment for collaboration.

Disadvantages of Using Brainstorming:

However, brainstorming also has drawbacks, it prioritize quantity over quality of ideas that can be useless. It may take too much time. Additionally, if the group is not adequately regulated and allowed to operate for an extended period of time, it can take a long time. In the same case students feel uncomfortable because discussions do not flow freely. On the other hand, students can be blocked by the most active ones (Aditya, 2019).

Challenges of group brainstorming

Blocking

When participants have an idea and want to discuss it, but someone else is talking, they may forget the idea they want to share while they wait for their turn (Brainstorming, 2022).

Personality characteristics

In any brainstorming session, we have different types of personalities, such as extroverts and introverts. Extroverts perform better than introverts where extroverts generate more new ideas rather than introverts (Brainstorming, 2022).

Collaborative fixation

The exchange of ideas in group reduces the number of areas that the group seeks for additional ideas and consequently the fixation is manifested in terms of limiting the variety of ideas investigated rather than the quantity of ideas generated(Nicholas,2018 as cited in Brainstorming, 2022).

Free-writing

Individuals believe that their thoughts are less significant when they are joined with those of the entire group. Furthermore, Diehl and Stroebe demonstrated that group brainstorming is less productive than individual brainstorming also they found that even when individuals worked alone they produce less ideas. However, experiments showed that free-writing was

just a minor factor in productivity loss, with the types of session (i.e., real vs. nominal group) contributed much more (Diehl 1991).

Evaluation apprehension

Evaluation apprehension occurs when "the fear of negative evaluations from other group members or external members prevents participants who are working in groups from presenting their more original ideas" (Diehl and Stroebe,1987). Thus, evaluation apprehension is the fear of being evaluated or tested. It became a significant obstacle to group brainstorming, where us respondents may be wary of sharing their ideas in front of the group and this because of the rejection of their suggestion.

Social Matching

One effect of group brainstorming is that members will adjust their productivity rate to match the rest of the group. Participants may generate less ideas in a group environment than they would individually because they will limit their own contributions if they believe they are more productive than the group average. On the other hand, the same effect can cause an individual's rate of production to increase in order to meet the group average (Diehl and Stroebe,1987).

Section two: Intellectual skill

Definition of intellectual skills:

The development of intellectual skills is a basic a need in English as foreign language settings. As a result, EFL teachers must employ teaching strategies and practices that positively contribute to the process of cognitive performance of faculties. As a result, researchers have proposed several definitions of intellectual strategy.

According to Bloom (1956), intellectual skills are the methods individuals can use to evaluate or organize information and data. Also it considered as the ability to obtain meaning

from one's experience. In addition to that, intellectual skills are the building blocks of all kinds of thinking.

Furthermore, an intellectual skill can be defined as a behavioral ability that facilitates the performance of a culturally relevant task when it is activated (Bergan,1971).

Intellectual skills, according to Shchukina (as cited in Iskakova et al, 2021),"they are mobile, mobile, variable; operate without fail in any situation and on any subject material." This means that intellectual skills differ and are used in multiple fields. Shamova (as cited in Iskakova et al, 2021) also defines intellectual skills as "the ability to acquire and process of the information" this means the ways used for collecting and organizing data.

Johnson (1997) said that intellectual skills are those mental processes that allow us to develop new knowledge, apply it in both familiar and unique situations, and define the mental processing that is used to acquire and use knowledge.

Zankov (as cited in Iskakova, 2021) defined as "combining into a defined functional system of different ways of mental activity." Even though there are several definitions of intellectual skills, but this does not effect in their meaning because they are an essential component of thinking.

Importance of intellectual skills:

- Intellectual skills are important aspects of our daily life that individuals must have in order to learn and brainstorm effectively.
- If learner's intellectual skills are sufficiently developed, they can communicate with others, obtain knowledge and process facts more effectively.
- Intellectual skills facilitate comprehension skills like the ability to compare and contrast. In addition it helps students to apply various rules and information for solving a problem.
- The importance of intellectual skills more appears in that they are vital used for

linking background knowledge with new one.

Approaches in intellectual skills:

The mental operations that allow us to gain new knowledge, apply that knowledge in both common and new contexts, and govern the mental activity that is employed to obtain and use knowledge are defined as intellectual skills. Different approaches are used by researchers and psychologists to comprehend the concept of intellectual skills. Some of the main approaches are as following:

Problem solving

In early studies of problem solving, it was defined as an advanced stage of thinking that involves the individual's need to seek a solution to a situation that has never before been encountered (Wallas, 1945). Problem solving has been understood as a system including a set of steps or processes, According to (Wallas, 1945), According to Wallas, there are four steps to problem solving. The first stage is preparation, which entails familiarizing oneself with the topic and adopting an exploratory perspective that allows for the emergence of many ideas. The issue solver does not consciously pursue a solution during the second step, incubation. There is a sense of insight in the third step, illumination, which leads to issue solving. The final step, Janet G. Donald verification, is to empirically or logically examine the idea. Problem solving is the process of organizing and symbolically representing knowledge in long-term memory so that it may be triggered quickly when a problem arises (Reif and Heller, 1982). Problem solving process contains: (1) understanding the problem to be solved, (2) classifying various actions that will be taken, (3) selecting in action, (4) identifying obstacles, (5) conducting an action, (6) evaluating what has been done (Gagne', Briggs, and Wager, 1988). in other words, students are required to be able to apply their diverse knowledge to various challenges through problem solving.

Creativity

Creativity is another approach in intellectual skills. In other words, creative thinking skills are important mental abilities that are mostly associated in education. Different previous studies were conducted with the aim of understanding the concept. Guilford (1950-1968) was a major investigator of creativity. He created four major factors with the purpose of testing creativity (Guilford, 1950). Three types of fluency made up the first factor. Ideational fluency was defined as the rate at which a large number of ideas were generated, such as a list of all solid yet flexible items. The ability to associate words was based on a relationship, such as all the opposites of small. Expressional fluency was defined as the ability to form words or sentences from a limited number of clues, such as in crossword puzzles. Another important factor was flexibility, which was defined as a measure of a person's ability to respond in many ways or categories. A second type of flexibility, adaptive flexibility, necessitated adjustments in task interpretation, method or strategy, or potential solutions. The third factor, originality, was determined by the rarity of an excellent response relative to other participants' responses. Elaboration, the final key factor, was a measure of the quantity of details or range of implications. These characteristics all represent the potential to generate a wide range of replies, with no single correct or fully decided response. As a result, they were termed measures of divergent, rather than convergent, thought.

Metacognition

Another key approach is metacognition or what is also known as strategic knowledge. The literal definition of metacognition is "beyond knowledge," based on its prefix meta (beyond) and root cognition (knowledge). Metacognitive abilities are not thought to be domain-specific. Remembering one's place in a long sequence of operations, knowing when a subgoal has been achieved, detecting errors, and recovering from errors by making the necessary corrections or returning to the last known correct operation are among the metacognitive skills identified as necessary for successful performance on general academic

tasks (Rigney, 1980). However, Flavell (1979) asserted that metacognition would produce a high interest. In fact, the theory of metacognition has been strengthened through investigations from different subjects, some of them include: educative psychology, learning science, computer science, artificial intelligence, cognitive psychology, the interaction between humans and computers, educative technology, engineering, mathematics education, education sciences, teaching education and literacy (Azevedo and Aleven, 2013). In other words, metacognition can be understood as how someone can think about his thinking.

Cognitive processes

The establishment of the taxonomy of cognitive objectives (Bloom, 1956) increased interest in cognitive processes among educational scholars in North America. Reasoning, problem solving, concept development, and creative thinking were all grouped into increasingly sophisticated behaviors in the taxonomy. Comprehension, application, analysis, synthesis, and evaluation were the categories of intellectual skills. Comprehension has been the emphasis of reading research, whereas problem solving has been seen as predominantly an application domain.

Critical thinking

It can be considered as the oldest approach to intellectual skills. In order to define critical thinking, Pascarella and Terenzini (1991) compiled the following, "…critical thinking has been defined and measured in a number of ways but typically involves the individual's ability to do some or all of the following: identify central issues and assumptions in an argument, recognize important relationships, make correct inferences from data, deduce conclusions from information or data provided, interpret whether conclusions are warranted on the basis of the data given, and evaluate evidence or authority, (p. 118). Researchers studying critical thinking in higher education frequently attribute this method to the Socratic tradition (Furedy & Furedy, 1983). According to the Furedys, critical thinking

requires a general tendency for disciplined inquiry, which is founded on an ability to examine all assumptions and the ability to identify when it is required to do so, disinterested scholarship, and the ability to analyze and evaluate. Disciplined inquiry, the first attribute, necessitates the investigation of premises or initial principles. This trait has also been referred to as the rejection of arbitrariness by others (Seigal, 1980). Disinterested scholarship, the second characteristic, implies retaining perspective or a dispassionate attitude toward the issue under debate, in other words, a distinction between the subject under study and oneself. The rejection of partiality is another name for this (Seigal, 1980). This trait has been dubbed the Greek style of thinking, in which problems are considered in isolation rather than in relation to human needs (Burnet, 1930). The ability to analyze and assess is defined as the pursuit of facts and reasoning, objectivity, or the right use of reflective skepticism in the literature (Furedy & Furedy, 1982; McPeck, 1981; Seigal, 1980). Moreover, critical thinking can be useful and beneficial when someone aims to analyze information, systematically solve problems, generate innovative solutions, plan strategically, think creatively, as well as to present his/her work or ideas to others in a way that can be readily understood.

Significance of critical thinking

Critical thinking is appreciated in both academic and professional settings, and it is an important component of lifelong learning. In life, critical thinking is crucial. It encourages creative thinking — thinking outside the box. It avoids getting too narrow. In higher education, critical thinking is expected of you. It can help you improve your decision-making, evaluation, and problem-solving skills.

Categories of intellectual skills

Intellectual skills are a key aspect of academic learning, which define how to apply procedures to achieve things. There are five main categories of intellectual skills which are

categorized depending on the complexity level of the skill. According to Gagné et al (1992) those categories can be explained as followed:

Discriminations

The first intellectual skill to achieve is discrimination. It is the ability to differentiate one feature of an object or sign from another, such as textures, letters, numbers, shapes, and sounds. The ability to tell the difference between different stimuli is the human performance or learning outcome achieved by discrimination. In other words, it is a requirement for further education. the ability to categorize items based on one or more of their features

Concrete Concepts

After discrimination learning is completed, concept learning happens. Concrete concepts are the simplest of the two concept categories and consist of classes of object features, objects, and events. Some are relational, such as up, down, far, near, higher, lower. The ability to recognize a class of objects, object attributes, or relations by pointing out one or more examples or instances of the class is the performance or learning outcome gained through mastery of specific concepts. It is then the ability to comprehend items based on one or more distinctive features.

Defined consepts

Concepts necessitate not only identification but also definition. Defined concepts necessitate a student defining both general and relationship concepts by offering examples of each. For example, in order to teach the concept of alliteration, a student must first define alliteration, then describe its components, such as consonant sound, beginning sentence, and so on, and finally present particular examples of alliteration. In other words, it is the ability to provide an abstract for comprehending an object or engineering.

Rules

A rule is an acquired capacity of the learner that allows him to do something rather than simply state it. Also it allows you to respond to a set of objects with a set of performances. So, it is all about correlating concepts and objects.

Higher-Order rules

Higher-order rules are the results of learning to combine rules into more complicated rules utilized in problem solving. A student may combine two or more rules from distinct content to produce a higher-order rule that solves an issue when attempting to solve one. A higher-order rule is more complex than the basic rules that comprise it.

The role of brainstorming in developing the intellectual skills

Learning is deeper than a process of memorizing and recalling information. For successful learning sessions teachers are needed to use different teaching strategies which are basically assigned to help both teachers and students. This means that teachers are taking the responsibility of developing the students' intellectual skills rather than just assisting them for gaining knowledge and moving from one educational level to another.

Since developing learners' intellectual skills is required for a successful EFL learning. Then, it is really significant for teachers to use different strategies and activities which are helpful in the students' intellectual skills improvement.

When reviewing the previous related studies, various works were conducted with the aim to understand and highlight the significance of enhancing the level of creativity and thinking using different teaching strategies to reach a high thinking level. Sajjad (n. d.) conducted a study to assess the efficacy of different teaching methods employed at the graduate level. Two hundred and twenty undergraduate students from the faculty of arts at the University of Karachi were asked about their perceptions of the best and most effective teaching methods. According to the investigation, only 11% of students evaluated the brainstorming approach as

the best way, while the majority of graduate students selected the lecture method as the best method at the graduate level.

Brainstorming is one of the most effective strategies that helps in provoking and activating the students' creativity and original thinking, and this leads to the intellectual skills development, for this reason, a study was conducted by Al-Mutairi (2015) to investigate the effectiveness of brainstorming strategy in developing creative problem solving skills among male students in Kuwait, the study's findings revealed that brainstorming strategies were more effective than traditional teaching methods.

The use of brainstorming technique creates a free thinking environment that makes the participants more attracted to the session and the activity. Al-Khatib (2012) evaluated the impact of the Brainstorming technique on the development of creative problem solving skills among female students at Princess Alia University College. The study discovered considerable positive effect and encouraged faculty members to employ the Brainstorming technique in their teaching for improved results.

Patel (1988) investigated "the development of a Brainstorming technique program and its effectiveness on the creativity of secondary school adolescents." The study's main purpose was to establish the method for the Brainstorming technique and to investigate its impact on the creativity levels of secondary school students. He arrived at the conclusion that the Brainstorming method procedure was effective for fostering verbal and figurative creativity.

On the basis of the previous studies' review, brainstorming is an important teaching strategy for promoting creative thinking. It is also beneficial for school instructors to increase their learning outcomes and critical thinking, problem solving abilities, and other personality qualities. It is also useful for teachers to depart from the usual methods and provide a beneficial enjoyment for the learners.

Conclusion

This chapter is divided into two main sections. Each section contains a variety of titles and sub-headings; it has basically presented the theoretical framework of both concepts: Brainstorming strategy and intellectual skills. The first section dealt with the concept of brainstorming including its definition and importance. Further, the strategy's types and application (steps and rules) were also presented in addition to the advantages, disadvantages, of brainstorming, its stages, and the role of the teacher during the brainstorming session. However, in the second section a definition of the intellectual skills was introduced, in addition to its significance. Besides, there are also key approaches and categories related to the current concept. And finally, some previous studies that dealt with the relationship between the two concepts and the impact of using the brainstorming strategy on developing the intellectual skills.

After reviewing the existing literature to investigate the impact of teaching with brainstorming and its role in developing intellectual skills, we can conclude that the use of brainstorming technique in teaching EFL can be a beneficial and effective to develop the students' intellectual skills.

Chapter Three: Research Design and Methodology

Introduction

In this chapter, we are concerned with the practical part supporting the review of literature tackled in the second chapter. It presents the methodology undertaken in this research. It gives information about the participants and illustrates where the study was conducted. In general, it sheds light on the research institution, which includes population sampling, teachers and students as participants. Additionally, it covers the research instruments which are questionnaires for both teachers and students. The last part of the chapter is devoted to the research design and procedures.

Research Method

In this study, a descriptive research method was applied with both qualitative and quantitative data analysis in order to find answers to the current research questions and validate or disprove the present study's hypothesis. The qualitative method was used to enables us to understand the term brainstorming, including its importance, types, application (rules and steps), stages, in addition to the main difficulties during brainstorming session, as well as the strategy's advantages and disadvantages. Besides, the qualitative data enables us to define the intellectual skills and the elements that are related to. On the other hand, a qualitative method was chosen to investigate the perception towards the positive use of brainstorming in increasing learners' intellectual skills. Furthermore, two questionnaires were used to improve the reliability of the findings.

Participants

For the current study, a sample of thirty (N=30) students were chosen randomly from three (3) groups of totally 62 students from Master one classes in the English Department of Chadli Bendjedid University_ El taref. And it was difficult to gather this number of participants because of some conditions. The reason behind the selection of working with Master one is that they are already experienced with different strategies of teaching/learning

processes. However, they are not aware about the concept of brainstorming strategy itself. Considering the teachers as participants, a questionnaire was conducted to 10 teachers from the same department, as they have practiced teaching with various strategies especially brainstorming. the reason behind such choice was to examine the degree to which teachers are aware about the effectiveness of using brainstorming strategy in teaching and developing intellectual skills.

Research Instruments

To collect the appropriate data needed to answer the research questions and to confirm the hypotheses stated in the theoretical section of the research paper, we used two main questionnaires administrated to both teachers and students. The questionnaire was distributed to 30 MA1 students, consisted of fifteen (N=15) clear questions that can be understood by everybody. The aim of our questionnaire is to give them a chance to express their thoughts and opinions about the use of brainstorming strategy and its impact in developing students' intellectual skills. On the other hand, our research paper also based on teachers questionnaire that contain of thirteen (N=13) questions which addressed only to the teachers of English in CBU, EL-Taref.

Description of Students' Questionnaires

The students' questionnaire is made up of two sections which consist of 15 various questions. These questions are closed ones requiring the students to choose either yes or no answers or to pick up the appropriate answer from several choices. In addition to open ended questions requiring them to give their personal opinions, preferences or just to justify their answers.

Section one: Brainstorming strategy

Section one is consists of nine questions (Q01_Q09) about the use of brainstorming as a strategy. The purpose of this section is to find out if the students are using the brainstorming

strategy inside the classroom. Additionally, it attempts to provide their opinion about difficulties that they face in classroom.

Section two: Intellectual skills and creative thinking development through using brainstorming

This section includes six questions (Q10-Q15) focuses on the use and the effectiveness of brainstorming in developing students' intellectual skills and creativity in classroom. As well as it seeks to show the main steps that students follow in order to generate ideas.

Description of Teachers Questionnaire

In the current study, we also created a questionnaire for teachers. We start with a small introduction to motivate them about the topic and to thank them in advance for their collaboration. The teacher's questionnaire was distributed to eleven teachers who helped us to gather data to achieve the research goal .it composed of (13) questions divided into two sections. Those sections consist of close ended questions such as yes or no, and some "WH" questions, in addition to open ended question to elicit their personal opinions. The questionnaire aimed to investigate teachers' opinion regarding the positive use of brainstorming strategy as an important factor to increase learners' intellectual skills and creative thinking development.

Section one: Brainstorming strategy

This section consists of five (05) questions (Q01-Q05).The first question is designed to know the benefits of calling up students' prior knowledge. The second one aimed to know if teachers use the brainstorming strategy during the session. Besides, the third question is about the teachers' opinion concerning the impact of brainstorming in improving critical thinking. The fourth question designed to know which type of brainstorming mostly adopted by teachers during the sessions. The ending question of the section aimed to know if students being active when using brainstorming.

Section two: Intellectual skills and creative thinking development

In this section, there are seven (07) questions (Q06-Q13). It begins by emphasizing the importance of using brainstorming in EFL classroom. Also, teachers have been asked to mention some steps that they use for brainstorming session preparation. As well as it investigate teachers' perspectives on the benefits of brainstorming in the development of intellectual skills.

Research Procedures

This descriptive research was conducted with Master One students in the second semester of the academic years 2021/2022 and asked them to be a part of this study. At the beginning of the study, we distributed the questionnaire to thirty (30) students among MA1 English students at university of Chadli Ben Djdid El-Taref. Those participants selected randomly from three groups and they were asked to tick choices in the corresponding boxes and make a full statement whenever necessary in order to add their own point of view or his/her attitude towards effectual use of brainstorming strategy. There was no time limitation and the students were allowed to think carefully and then rank the choices. The process took two days to gather data from the participants. In the next stage, we administered questionnaire to ten (10) teachers of English at the same Department, They were asked to tick choices in the corresponding boxes or provide information whenever necessary concerning. The presented study which is investigating EFL teachers who know how to use the brainstorming strategy can help their learners to develop their intellectual and critical skills.

Conclusion

This chapter provides a view about the methods used in order to accomplish our study, the procedures and also the tools we have used in the aim of collecting data about exploring the impact of brainstorming strategy to develop student's intellectual skills. The results that we founded we will discuss it in the next chapter.

Chapter Four : Data Analysis

Introduction

This chapter is concerned with the presentation of the findings from both learners' and teachers' questionnaire of this research. It comprises two sections. The first section is devoted to the analysis of students' questionnaire which was administrated for 30 participants and the second part is related to the analysis of teachers' questionnaire which was given to 10 participants.

Students' Questionnaire Analysis

Section One: Brainstorming Strategy

Question 01: Are you aware about the brainstorming strategy?

Yes ☐

No ☐

Option	Number (N)	Percentage (P)
Yes	29	96,67 %
No	1	3,33%
Total	30	100%

Table 01: learners' awareness about the brainstorming strategy

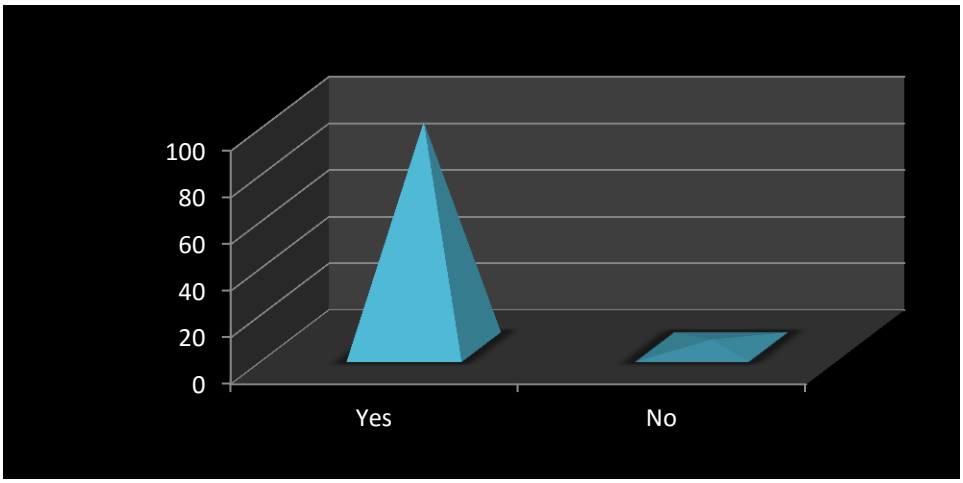

Figure 01: learners' awareness about the brainstorming strategy

This question was asked to know if the participants aware about the brainstorming strategy or not. Table 01 shows that the majority of them (96,67%) stated that they know about the brainstorming strategy. Whereas only (3,33%) declared that they don't know about it, which means that learners are conscious about the brainstorming strategy.

Question 02: Do you face difficulties while solving problems?

Yes ☐

No ☐

option	N	%
Yes	27	90
no	03	10
total	30	100

Table 02: Learners' Difficulties while Solving Problems

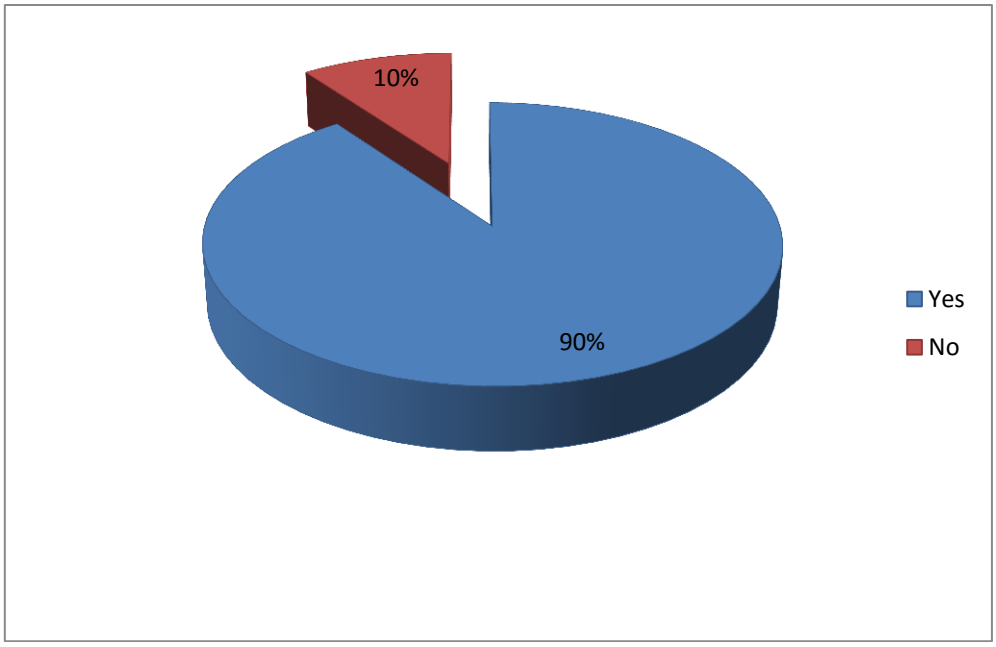

Figure 02: Learners' Difficulties while Solving Problems

In accordance with the results presented in figure 01, (90%) of learners answered that they face difficulties when they solve a problem, however, only 03(10%) of them said that they do not encounter any difficulty when solving problems.

Question 03: Are those difficulties because of:

a. **Lack of prior knowledge** ☐

b. **The misunderstanding of the problem** ☐

c. **Others** ☐

State them …….

Options	**N**	**P**
a.Lack of prior knowledge	14	46;67%
b. The misunderstanding of the problem solving	10	33,33%
c. Others	6	20%
Total	30	100%

Table 03: Difficulties' Reasons during problem solving

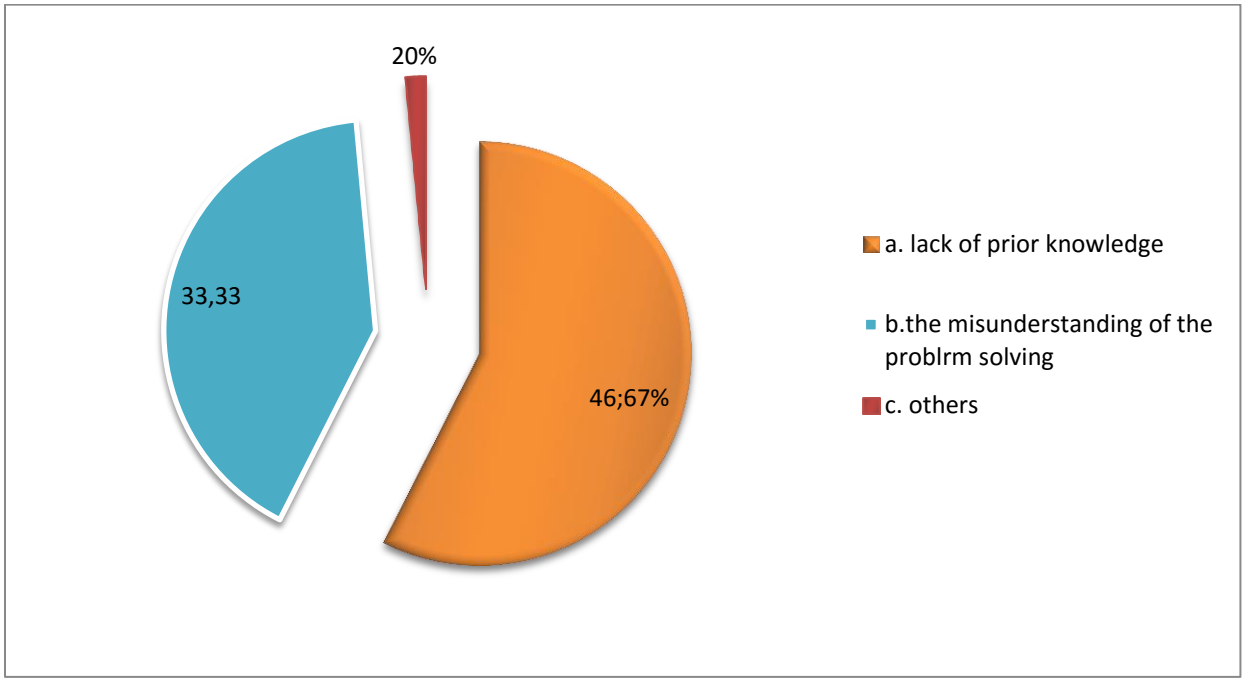

Figure 03: Difficulties' Reasons during problem solving

The question aims to show the reasons behind those challenges during solving problems. So, most of students who present (46,67%) declared that those difficulties because lack of prior knowledge, and this may be because the lack of preparation for class and lack of memorization, or they have relevant knowledge to certain topics. However (33,33%) of them declared that the cause of those difficulties is the misunderstanding of the problem solving. The rest (20 %) said that there are others difficulties but they don't mention it, only two of them said "it depends on the problem's nature".

Question 04: are you encouraged by your teachers to use the brainstorming strategy?

Yes ☐

No ☐

If yes, How ?

option	N	%
Yes	14	46,67%
no	16	53,33%
total	30	100%

Table 04: teachers' encouragement concerning using brainstorming strategy

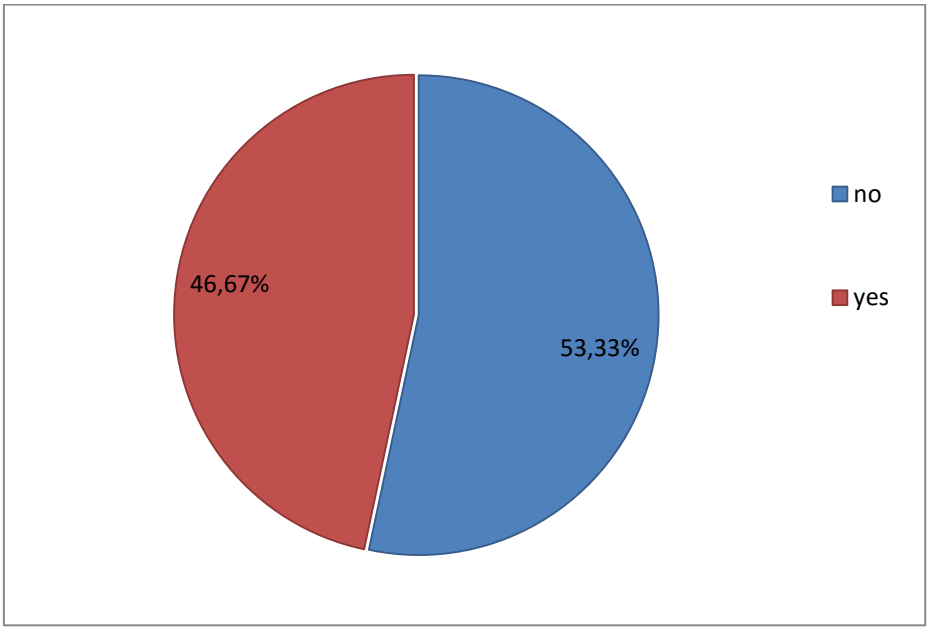

***Figure 04*: teachers' encouragement concerning using brainstorming strategy**

As it shown in the fourth table, 14 (46,67%) learners answered that their teacher encourage them to brainstorm. Whereas the majority of them (53,33%) admitted that they are not encouraged by their teachers. Hence, the result reveal that the teacher have negative attitude towards brainstorming strategy and therefore students discouraged. And only seven students from 14 students with their yes answers justify how they encouraged

- Teachers encourage us by asking open ended questions that provoke multiple answers. (1 student).

- Asking students to write down or to think about any words/ expression related to the topic.(2 students)
- They ask students to think deeply before answering and sharing ideas. (2 students).
- We are asked to use draft to brainstorm our ideas and then to rewrite the actual task.(2 students).

Question 05: Do you use brainstorming technique to solve problems inside the classroom?

Yes ☐

No ☐

Option	**N**	**P**
Yes	25	83,33 %
No	5	16,67 %
Total	30	100 %

Table 05: Learners' use of brainstorming technique inside the classroom

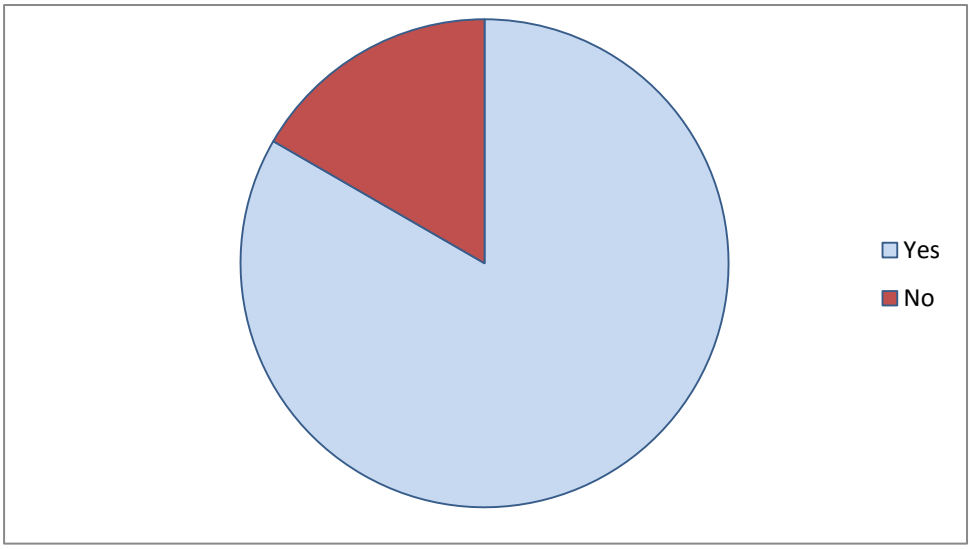

Figure 05: Learners' use of brainstorming technique inside the classroom

The result of table 03 indicated that the majority of participants (83,33 %) answered that they use brainstorming in order to solve problem inside the classroom. This means, that brainstorming is useful way that can be used in classroom to solve different topics. However, only (16,67 %) of them declared that they don't brainstorm during solving problems.

Question 06: Do you prefer to brainstorm:

Please, justify

Option	N	P
Individually	14	46,66%
Group	8	26,67%
Both	8	26,67%

Table 06: Learners' Preference in Brainstorm

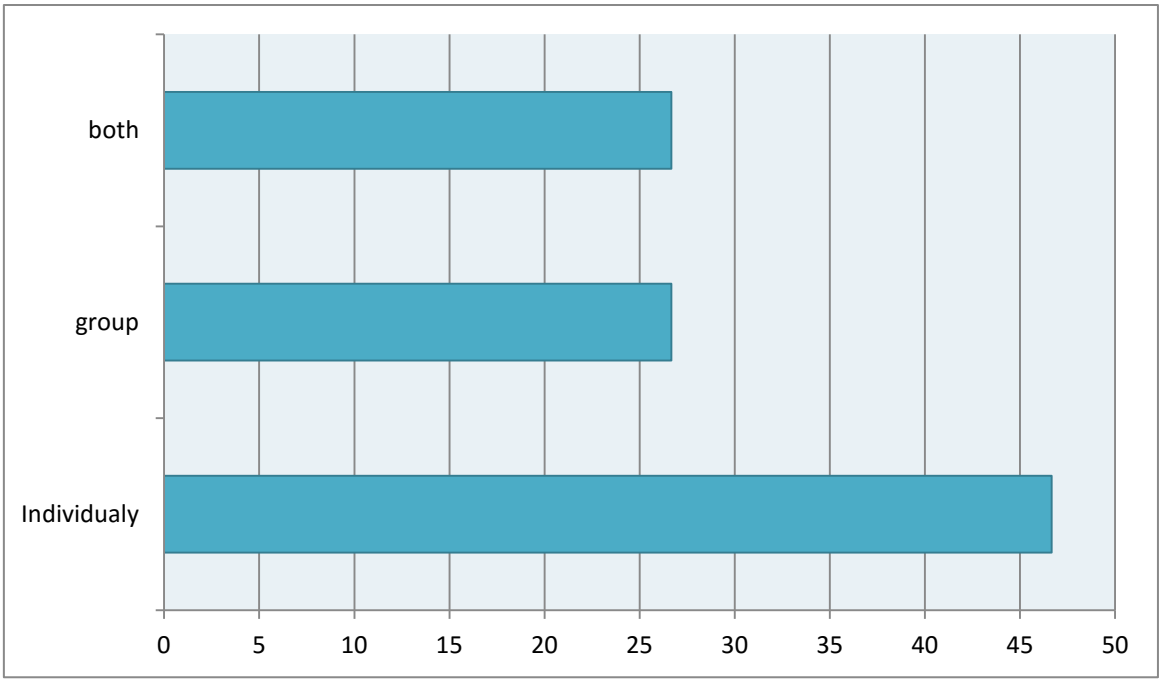

Figure 06: Learners' Preference in Brainstorm

This question aims to know which type students prefer to work in either individually, groups or in both of them. The results in the table 04 and figure 04 above showed that (26,67%) of students said that they prefer to work in groups and almost the same percentage (26,67%) of the students said that they prefer to work in both groups and individually. While, 46,66% of them indicated that they have preferences for working individually instead of the previous one. I ask this question to find out why learners prefer to work individually, in groups, or both.

Please, justify:

Only eleven students from those how prefer to work individually justify their answers as follows:

- Because I don't like to share my personal plan and my ideas with others.
- It allows me to be more creative and it helps me to organize my ideas better.
- I prefer to deal with my own ideas all by my self.
- Having multiple opinions is often distracting for me.

- I can think better on my own.
- Because when I work in group I feel confused and the ideas do not come easily.
- I feel comfort when I make my own analysis and notes.
- To keep the flow of ideas going with no interruption in the process of thinking.
- I don't find much difficulty in solving my problems, and I often do not resort brainstorming because in the end it is my own problems and expanding it will cause a complication, my way is to use the information I know from my journey towards human actions and I try to see the similarity of the problem with something I sow before, and take it calmly, deliberately and not make it too personal to avoid personal feelings.
- I concentrate more and fell comfortable.
- I am an independent learner, and I feel relaxed when I work individually.

From the justification above, I have come up with that those learners feel better when they brainstorm alone, and when they working by themselves they will be more creative.

The 26,67 % of the students who prefer to work in groups justify their answers as follows:

- Because with more point of views we get more ideas.
- Group brainstorming work is more motivating.
- In order to find solution and change information together and different understanding make the solution of the topic easy.
- The more we work in group the more we remember better and find various ideas.
- To take and give ideas together and to help each other.
- Working in group let us exchange different ideas and know each other

- I prefer to work in group even if I don't know them in order to get more ideas and new information.
- To get more ideas.

As a result to the previous justifications of those how prefer to work in groups, I noticed that they are familiar with the benefits especially when it allows them to learn more ideas and sharing different information.

The justification of 26,67 % students who answered that they prefer to work in both as follows:

- Both are evident ways to work with, it depends on the cases.
- Because there are many situations in the classroom that sometimes dictate how we brainstorm.
- It depends on the situation.
- Varying the pattern.
- Wither group or individually you are working to meet the same purpose.
- Both of them are important in selecting ideas.
- When I am in class I prefer to brainstorm in groups and to exchange ideas with my classmates, and I prefer to work individually to concentrate more.
- I chose both of them, because each type help me to get new information and they have the same effect.

Through this justification it is clear that the two types are important to some of learners and both of them have positive effects.

Question 07: Do you find brainstorming as a strategy to improve your creativity and problem solving:

a. effective ☐

b. useless ☐

Options	N	P
Effective	28	93,33%
Useless	2	6,67%

Table 07: students' opinion about brainstorming as a strategy in improving students' creativity and problem solving

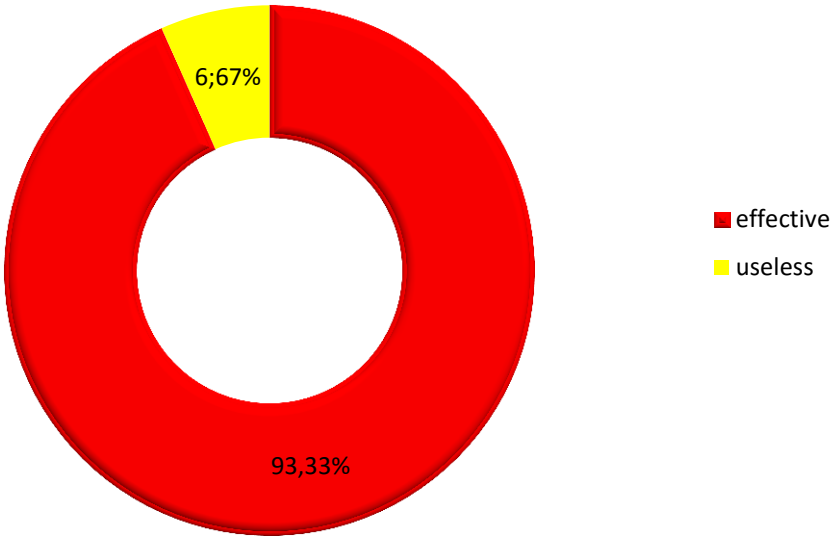

Figure 07: students' opinion about brainstorming as a strategy in improving students' creativity and problem solving

As can be seen from the figure 05, approximated 93;33% of the participants agree that brainstorming is an effective strategy to improve learners' creativity and problem solving. While, 6,67% of them claim that it is useless.

Question 08: During brainstorming session, do you generate a lot of ideas about the Topic?

a. **Yes, quickly** ☐
b. **Yes, but some how** ☐
c. **No, I have a problem of being blocked** ☐

Option	N	P
A	10	33,33%
B	17	56,67%
C	3	10%
total	30	100%

Table 08 : The amount of ideas generated during brainstorming sessions

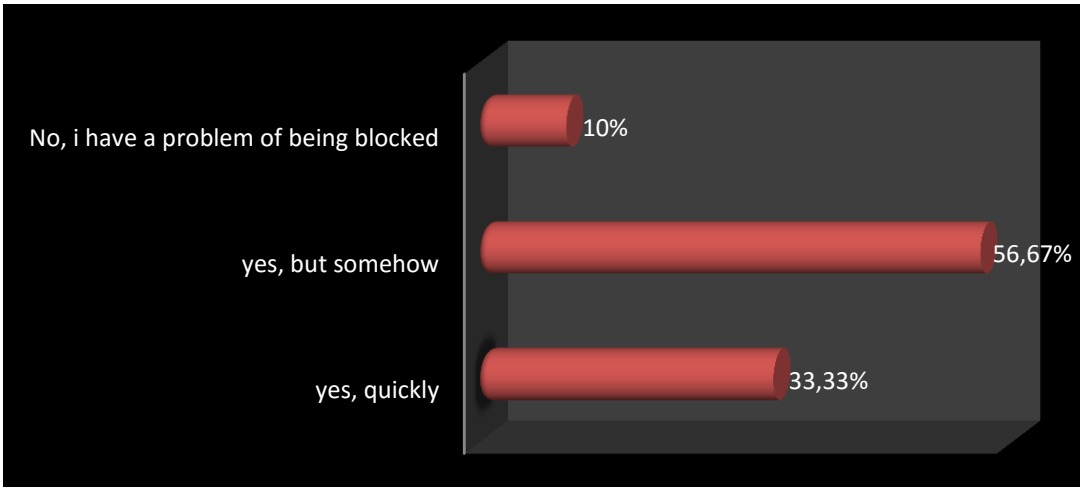

Figure 08 : The amount of ideas generated during brainstorming sessions

This question is important to know whether learners in brainstorming session generate a large number of ideas regarding to the topic or not. The results show that the most students (56,67%) responded by yes, but somehow they can generate a lot of ideas. (33,33%) answered by yes, quickly that they can generate more ideas, and only (10%) said no, I have problem of being blocked.

Question 09: Do you think that students would be more motivated using brainstorming?

a. **Strongly agree** ☐
b. **Agree** ☐
c. **Disagree** ☐

	N	%
A	7	23,33%
B	21	70%
C	2	6,67%
Total	30	100%

Table 09: learners' opinion on the use of brainstorming as a motivated strategy

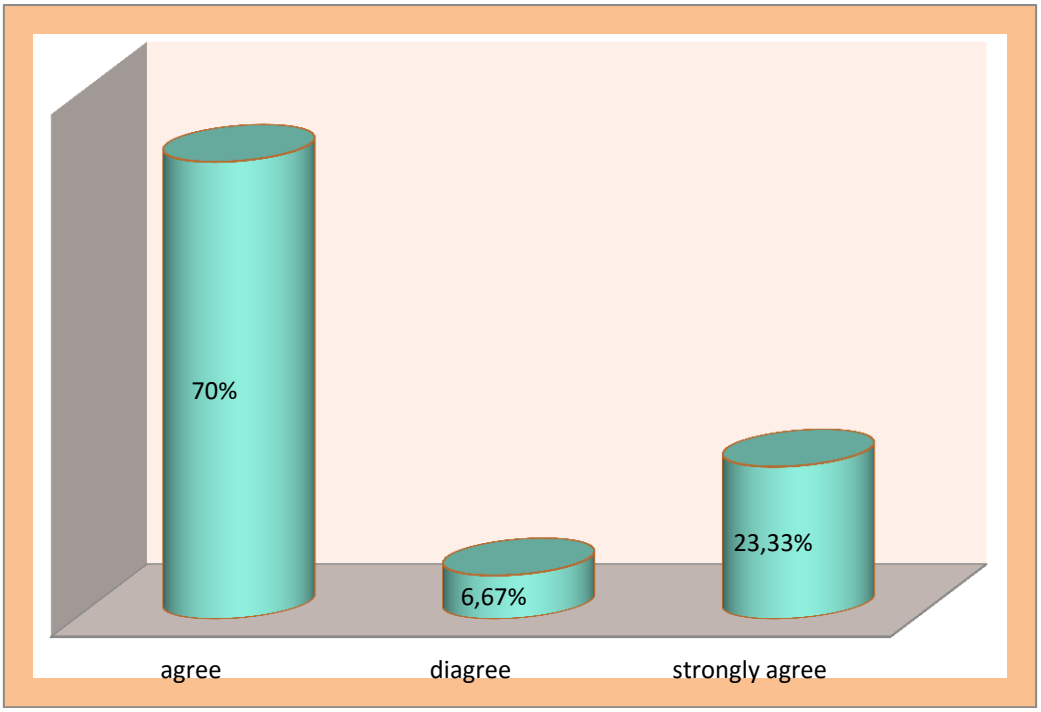

Figure 09: learners' opinion on the use of brainstorming as a motivated strategy

From the given answers, about (23, 33%) strongly agree with the fact that students would be more motivated when they use brainstorming. On the other hand, 21 participants representing 70% agree that students would be more motivated using brainstorming strategy. While only 02 participants disagree with.

Section two: Intellectual skills and creative thinking development through using brainstorming

Q10: Do you know what intellectual skills are?

Yes ☐ **No** ☐

	N	%
Yes	17	56,67%
No	13	43,33%
Total	30	100%

Table 10: Learners' awareness about what intellectual skills are

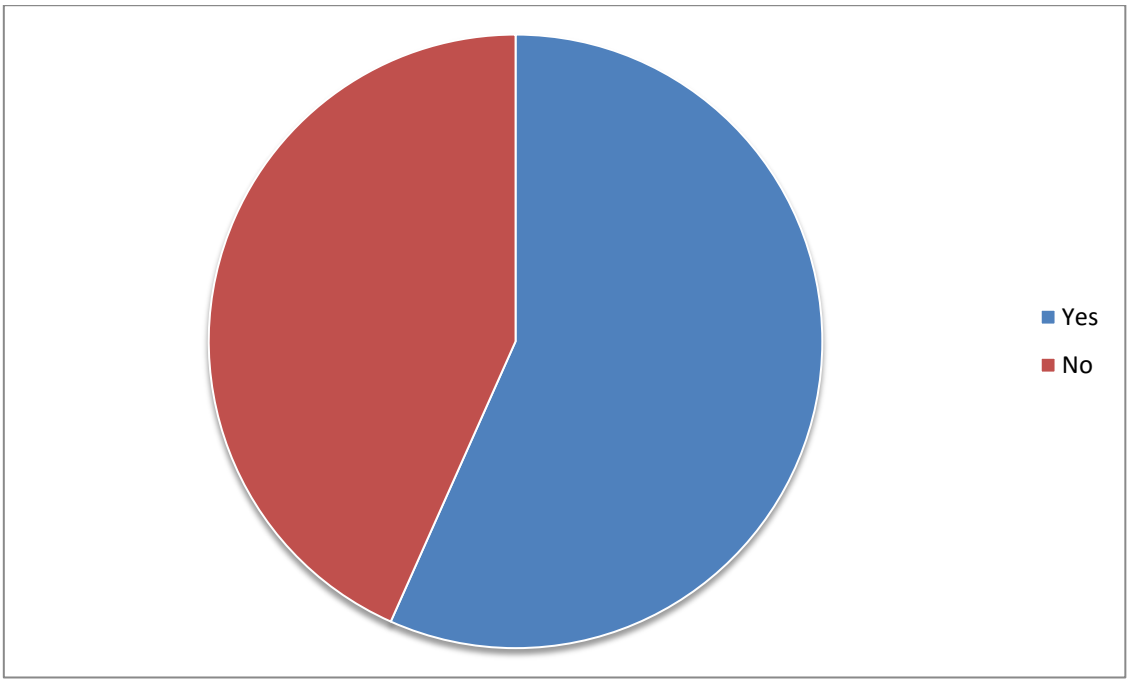

Figure 10: Learners' awareness about what intellectual skills are

The purpose behind this question is to see if learners know what intellectual skills refer to. The above table clarifies that most of the students (56, 67%) said yes they know what intellectual skills, however, (43, 33%) of them said that they don't know those intellectual skills.

Q 11: Do you think that the use of brainstorming strategy is functional in generating ideas?

Yes ☐ **In some cases** ☐ **No** ☐

options	N	%
Yes	17	56,67%
In some cases	0	0%
No	13	43,33%
Total	30	100%

Table 11: learners' views about brainstorming as a functional tool in generating ideas

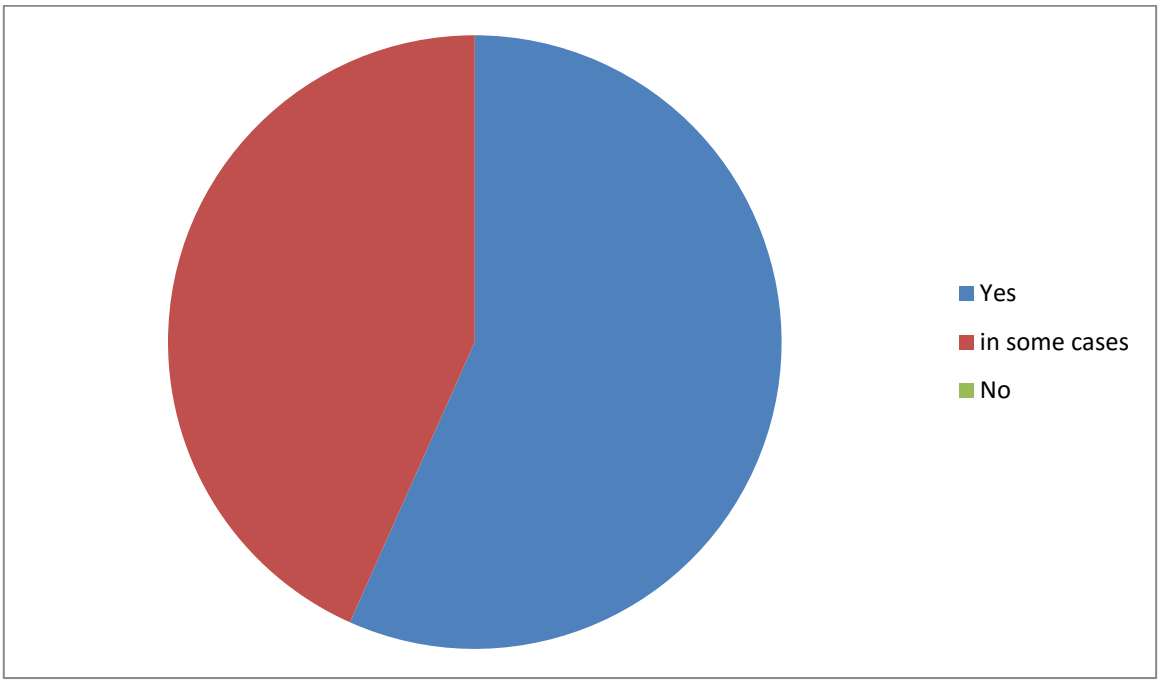

Figure 11: learners' views about brainstorming as a functional tool in generating ideas

In accordance with the results presented in table 11, the "No" option was not selected. However, 56, 67% of the respondents stated that the use of brainstorming strategy is functional in generating ideas. While 43,33% of them said that in some cases brainstorming is functional in generating ideas.

Q 12: Do you think that using brainstorming in classroom sessions would develop your thinking and intellectual skills?

Yes ☐

No ☐

Please, justify

	N	%
Yes	**28**	**93,33**
No	**2**	**6,67**
Total	**30**	**100%**

Table 12: Learners' opinion on the development of thinking and intellectual skills through the use of brainstorming

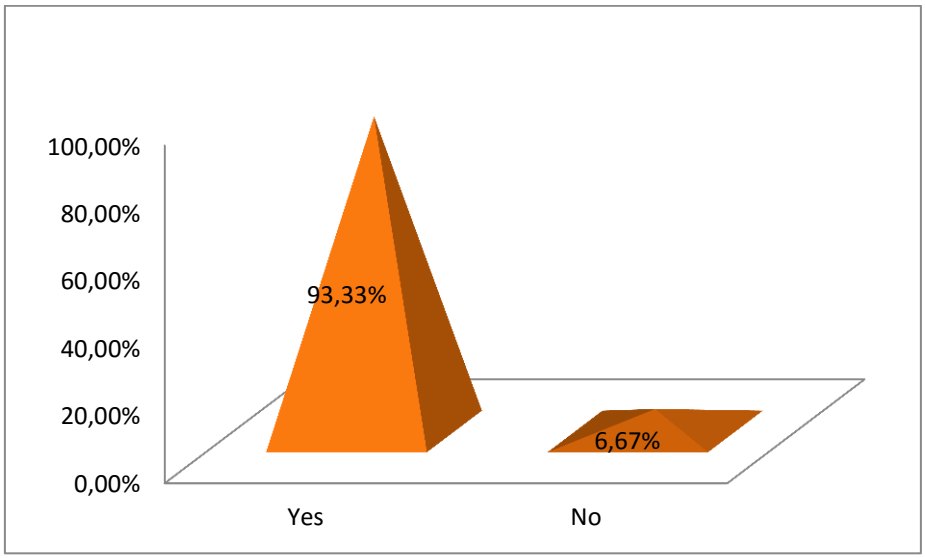

Figure 12: Learners' opinion on the development of thinking and intellectual skills through the use of brainstorming

Impressively 93,33% of the participant say that brainstorming sessions can help them to develop their thinking and intellectual skills, means that brainstorming in classroom sessions play an important role in improve their thinking and intellectual skills.

The majority of the respondents who answered with "yes" did not justify their answers. Only few of them shared some, which are the following:

- Yes, it gives me a chance to think more about what to write.
- Giving students enough chances to think and illustrate would develop their thinking and their intellectual skills.

- It helps our mind to give different ideas.
- It promotes thinking and helps students to be creative. Also, it gives them the chance to analyze when sharing ideas.
- Brainstorming is useful to generate new ideas, hence, discovering new ways to deal with different kinds of problem
- Communicates with classmates and sharing ideas is one of the effect of brainstorming.
- Because our brain can work and collect ideas quickly which develop our thinking and intellectual skills.
- Brainstorming in the sessions is very helpful, you would collect knowledge and ideas then organize them.

Based on the learners' justifications, it is likely to note that using brainstorming in classroom sessions would develop their thinking and intellectual skills. However, without any hesitation the rest of the participants (6, 67%) replied with "No" the use of brainstorming during sessions would not develop our thinking and our intellectual skills. One of them justified his/her answers by "Brainstorming is something that can be said that it is very organized. The best way to use it is solve problems that require sharp intelligence, where you generate and separate your ideas…As for doing it in lessons, brainstorming for me is not worth this importance in developing our thinking. That is because generating ideas and intelligence in school is something normal that happens due to repetition." This means that according to this student brainstorming is just a tool used.

Q 13: Are you aware about the benefits of brainstorming for creativity and intellectual skills' improvement?

Yes ☐

No ☐

	N	%
Yes	**18**	**60%**
No	**12**	**40%**
Total	**30**	**100%**

Table 13: The amount of benefit from brainstorming strategy

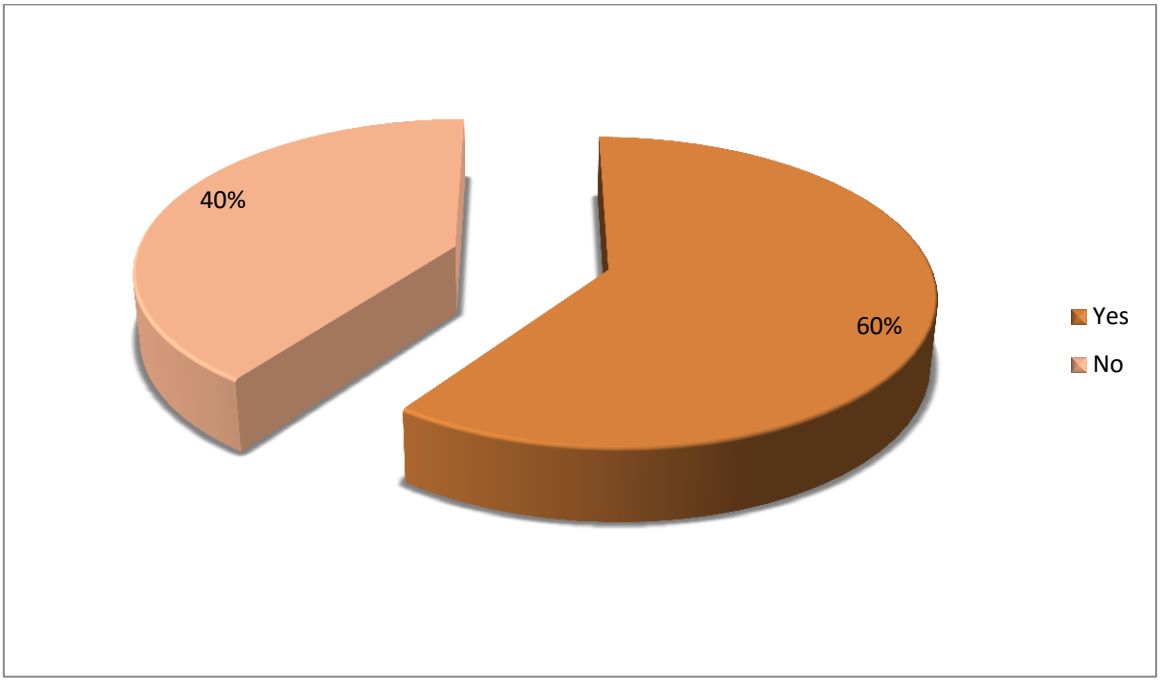

Figure 13: The amount of benefit from brainstorming strategy

This figure visualizes students' answers towards the benefits of brainstorming in improve their creativity and intellectual skills. The findings reveal that most of them, 18 (60%), have claimed that they are aware of the benefits of brainstorming, while 12 (40%) of students indicated that they are unaware of its benefits.

Explain:

In here, we asked the students to explain their answers. The majority did not explain; others shared some opinions.

Some students who answer with yes, their explanations are as follows:

- By brainstorming we are going to understand the next session.

- Brainstorming keeps the cognitive system active all the time. So, one could improves solutions at any moment.
- It encourages inquiry based learning and using prior knowledge.
- Yes, It help you retrieve existing knowledge and link it with new knowledge to solve the problem
- The ability to solve problem and the use of prior knowledge in different topics is one of the positive effects of brainstorming.
- Brainstorming helps students to improve their creativity and intellectual skills because it helps to ameliorate the cognitive approaches of creativity in learning.
- To organize your ideas more and to pick up accurate expressions.

From the given answer we understand that using brainstorming is beneficial in developing students' creativity and intellectual skills. On the other hand, 12 students with "No" option no one of them explains.

Q 14: Briefly, would you state the steps you follow to brainstorm?

This question is asked to check the main steps used by the students to brainstorm especially in generating ideas. It is noticeable that only 13 participants (43,33 %) mentioned some steps that they use during a brainstorming session, as follow:

- Be familiar with the topic, to think about all possible and related ideas, then, I select the best ideas, finally apply or share them.(05students)
- First of all, I chose the topic, then I brainstorm by collecting all the previous information about it, finally, I organize them.
- Thinking, generating ideas, ordering them and writing down.(02 students)
- I can brainstorm by remembering the situation where I get my previous idea

- To have a clear understanding for the topic/ to write down/ think of any idea related to it.
- Collecting dada, sharing collected data, analyze data, criticize the methodology, understand and define the problematic, propose solutions.
- I write down anything that comes to my mind in relation to the topic, I select what I need, I order and organize the most important ideas.
- Thinking about the answers/ writing possibilities/ check all the writing ideas/ select the most appropriate/ then write the final answer.

To sum up, based on the results obtained from this question we understand that more than half of the students (57,33 %) they don't mention the steps they used in brainstorming session in order to generate ideas. While the remaining 43,33 % of our participants stated them.

Q 15: Do you think that brainstorming should be encouraged at Chadli Benjdid University, especially in EFL classes?

Yes ☐

No ☐

Option	**N**	**%**
Yes	**30**	**100%**
No	**0**	**0%**
Total	**30**	**100%**

Table 14: Students' views towards the encouragement of using brainstorming in CBU EFL classes

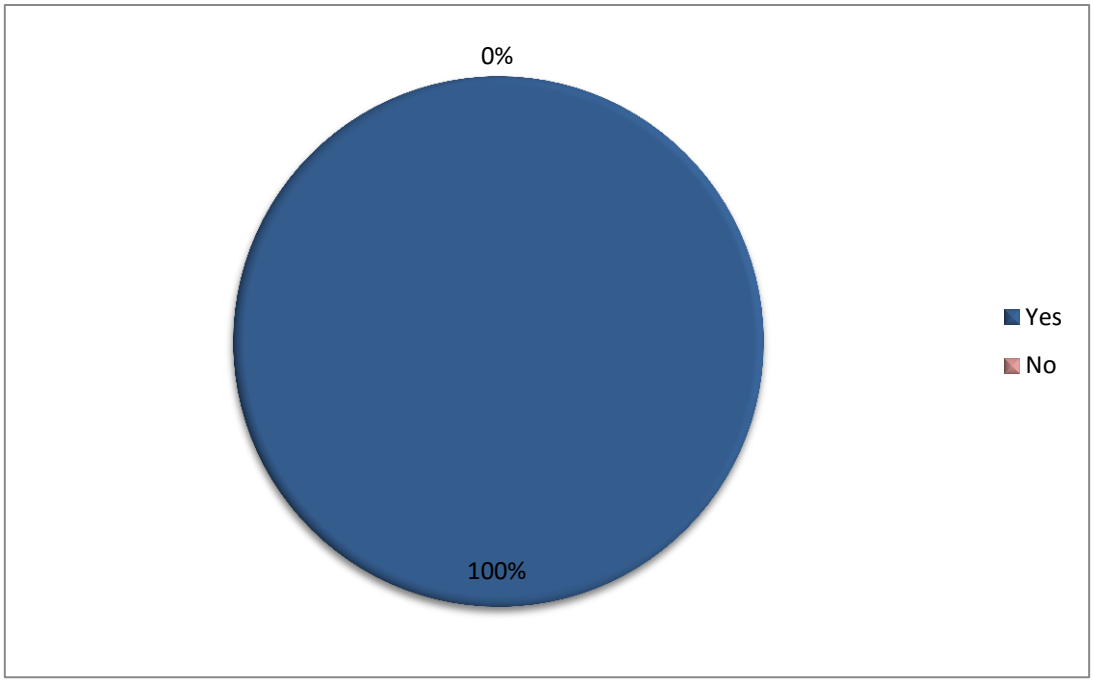

Figure 14: Students' views towards the encouragement of using brainstorming in CBU EFL classes

The above figure 15 reveals that all the participants 30 (100%) agree that brainstorming should be encouraged at Chadli Bendjdid University, especially in EFL classes. Thus, it is likely to note that these strategy increase the attention of the students to used it in the learning process and solving various problems, furthermore, brainstorming became a motivational tool in classroom and all the students showed their need for it.

Teachers' Questionnaire Analysis

Section One : Brainstorming Strategy

Q01 : Do you consider brainstorming is useful in activating students' previous knowledge ?

Yes ☐ **No** ☐

Options	Number	Percentage %
Yes	10	100%
No	00	00%
Total	10	100%

Table15 : Teachers' opinion about whether brainstorming activates students' previous knowledge

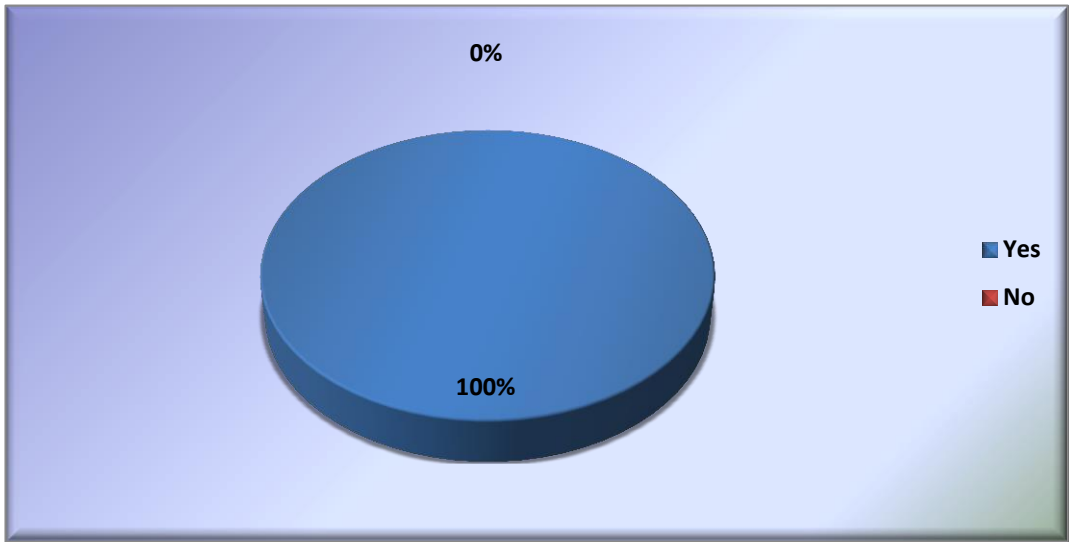

Figure 15 : Teachers' opinion about whether brainstorming activates students' previous knowledge

This question was asked to know about the teachers' opinons about the use of brainstorming and its impact in the activation of students' prior knowledge . All the participants (100%) agreed that brainstorming is useful in activating students' previous knowledge.

If yes, what are the benifits of calling up their prior knowledge ?

T01 : When students brainstorm their background knowledge, they can maintain new ideas when they express themselves thus not get stagnated or when they writ they found the necessary vocabulary to write effective essays.

T02 : It activates their schemata to get engaged to different activities.

T03 : Students learn bet ter when they first access what they already know and this plays a bi grole in improving English language prior knowledge Academic Literacy. (means active both eliciting and building initial knowledge).

T04 : - To warm up them and break the ice

- To connect current information and knowledge with the previous one
- To remember prior experiences
- To activate their schemata
- To interract in class
- To apply a learner centred approach

T05 : For paving the way to the present/coming course

T06 : Students will be able to finish their activities quickly without losing time. They will learn how to draw conclusions and make references, relationships and connections between ideas

T07 : Tapping on students' background knowledge will prepare them to digest the incoming input. Besides, if they are prepared ; they will be more motivated and confident to learn

T08 : calling up prior knowledge influences their capacity of problem solving skills, learning and achievement

T09 : To activate their schemata, so that they can interract during the classroom session

T10 : Activating prior knowledge is important in students understanding, because it helps them to make connections to the new information.

All the participants of the study agreed that calling up the students' prior knowledge is important and effective in expressing themselves and generating new ideas to solve problems. Besides, teachers explain the benifits from the recall of the students' prior knowledge during classes.

Q02 : Do you use brainstorming in your classes ?

Yes ☐ **No** ☐

Options	Number	Percentage
Yes	10	100%
No	00	00%
Total	10	00%

Table16 : The use of brainstorming in classes

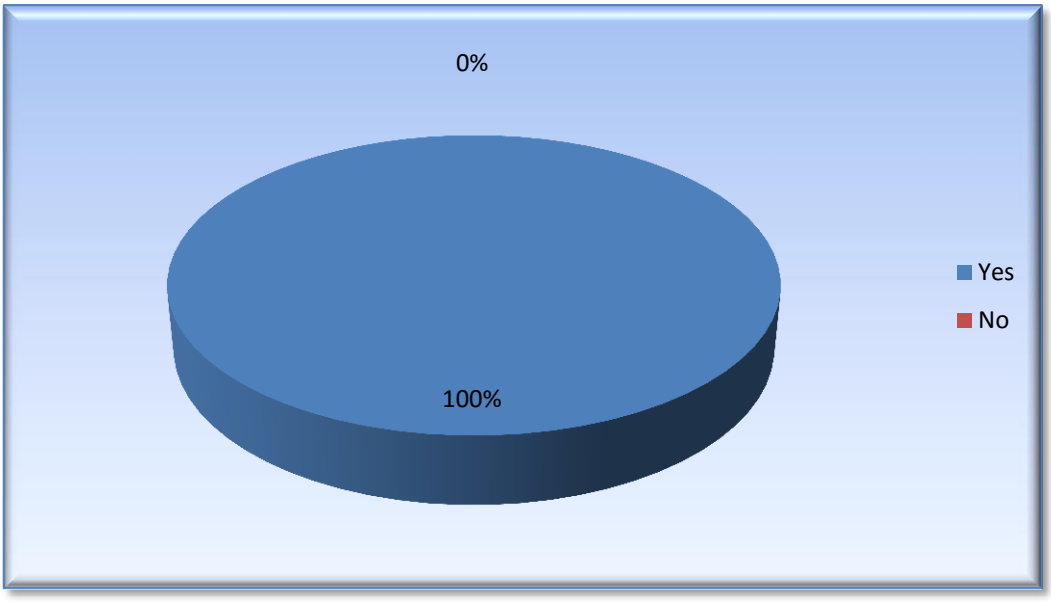

Figure 16 : The use of brainstorming in classes

This question aimes to know whether EFL teachers use brainstorming to teach during their classroom sessions. Based on the above table, it is understood that all of the teachers (100%)

use the brainstorming strategy in their classes, which means that this technique is useful in developing students' capacities and thinking abilities.

If yes, do you use it :

a- Usually ☐

b- Some times ☐

c- Rarely ☐

Options	N	P %
Usually	**8**	**80%**
Some times	**2**	**20%**
rarely	**0**	**00%**

Table 17 : Teachers' amount of use of brainstorming strategy in classroom sesions

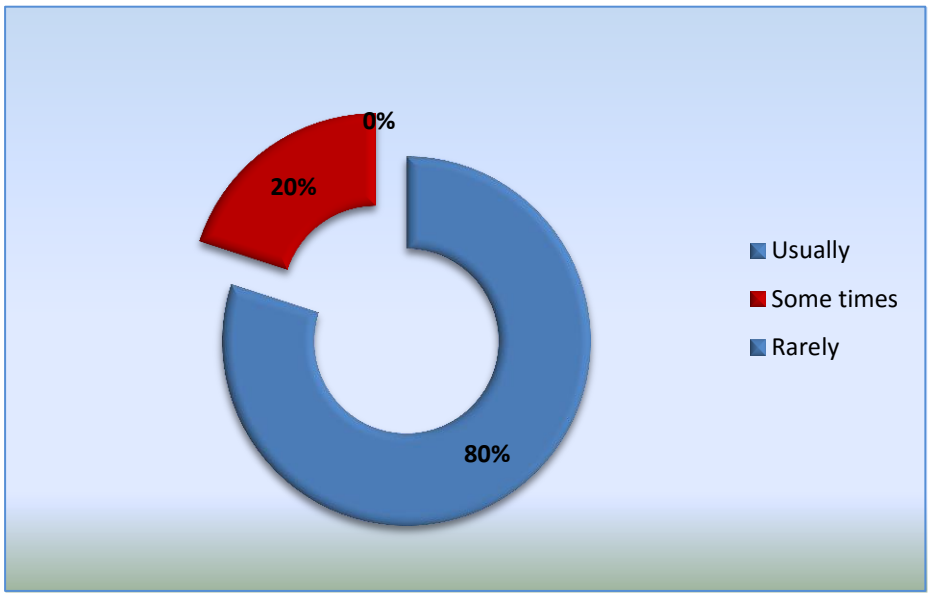

Figure 17 : Teachers' amount of use of brainstorming strategy in classroom sesions

The previous table and figure explain that the majority of teachers (80%) usually use brainstorming in their classes. However, only (20%) of them explained that they use the strategy some times. This identifies that the majority (80%) of them believe that the strategy is useful in teaching EFL.

Q03 : Do you think that brainstorming is effective in improving students' critical thinking ?

Yes ☐ **No** ☐

Options	N	P%
Yes	**10**	**100**
No	**00**	**00%**
Total	**10**	**100%**

Table 18: Teachers' opinion about the effectiveness of brainstorming in students' critical thinking improvement

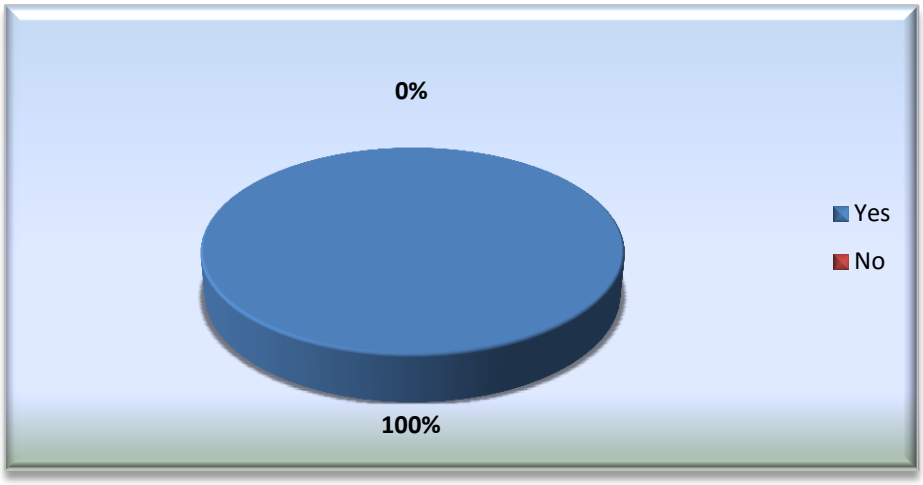

Figure 18 : Teachers' opinion about the effectiveness of brainstorming in students' critical thinking improvement

The asked question aimed to see the teachers' views of brainstorming as an improving strategy of students' critical thinking. The above figure clarifies that all the participants (100%) agreed that this technique is effective to improve students critical thinking level.

Q04 : Do you prefer your students to brainstorm :

- **a. Individualy** ☐
- **b. In groups** ☐
- **c. Both** ☐

Options	Number
Individualy	**3**
In groups	**00**
Both	**7**

Table 19: The most used type of brainstorming by teachers

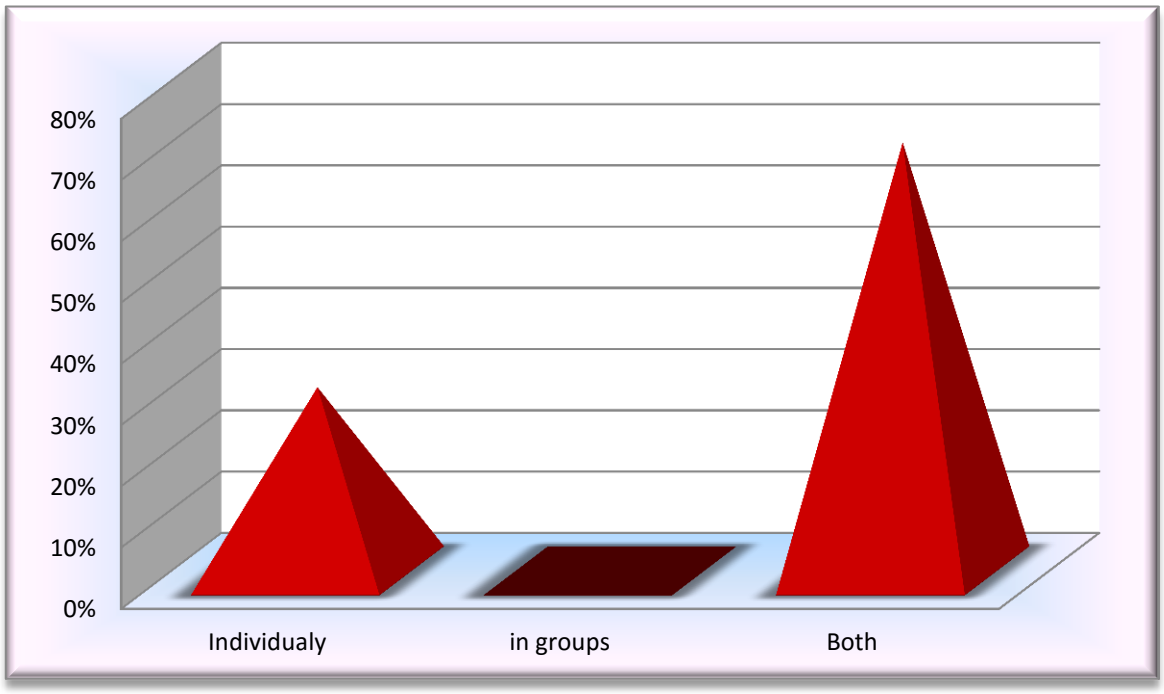

Figure 19 : The most used type of brainstorming by teachers

This question was asked to know the most prefered type of brainstorming to be used during the sessions. According to the above figure (30%) of teachers prefer their student to brainstorm individualy. Whereas, (70%) of them declared that they prefer their learners to brainstorm in groups.

Whatever your answer, please justify your answer.

7 teachers justified by the following :

- Doing that, they can take ideas from their classmates as they give theirs. Thus, interraction appears.
- Individual brainstorming provide them the opprtunity to depend on themselves and see the extent of their self-reliance. While brainstorming in groups let them exchange ideas and deduce generalizations or conclusions in less time.
- Students tend to exchange ideas together as it is helpful to generate new ideas which in their turn help in writing or in oral delivery.
- For the benifit of all
- Students brainstorm in groups or individualy. Because individual brainstorming needs to solve a simple problem, generate list of ideas…etc. and group brainstorling is effective for solving complex problems. But both still important.
- It depends on the nature of the problem. Individual brainstorming works better when it requires creative suggestions and a wider range of thoughts. Group brainstorming tends to develop deep ideas. So, using brainstorming as a mixed method is very effective.
- Individual brinstorming is useful when generating ideas to solve simple problems and when creative thoughts are needed. whereas, brainstorming in groups makes every one participate and and feel more effective.

However, the other teachers claimed that :

- This is a mental/cognitive activity that must be done individualy. If they brainstorm together they may not activate their knowledge i.e they would rely on others to think on their behalf.
- If working individually, students develop their critical thinking, but if they work in groups some of them can, whereas, some of them won't.
- Students when brainstorm individualy, they rely on their knowledge and capacities, whereas, brainstorming in groups they may face problems of being active and creative.

Upon those answers, the majority of the teachers prefer their students to brainstorm both in groups and individualy in order to generate more and better creative ideas and solutions. Whereas, 3 teachers declared that individual brainstorming would be helpful to activate the students' prior knowledge, so that they will not rely on others' thoughts.

Q05 : Do students participate and be active while using the brainstorming strategy ?

Yes ☐ **No** ☐

Options	Number
Yes	**10**
No	**00**
Total	**10**

Table 20: Teachers' views About the Students' Participance When using Brainstorming

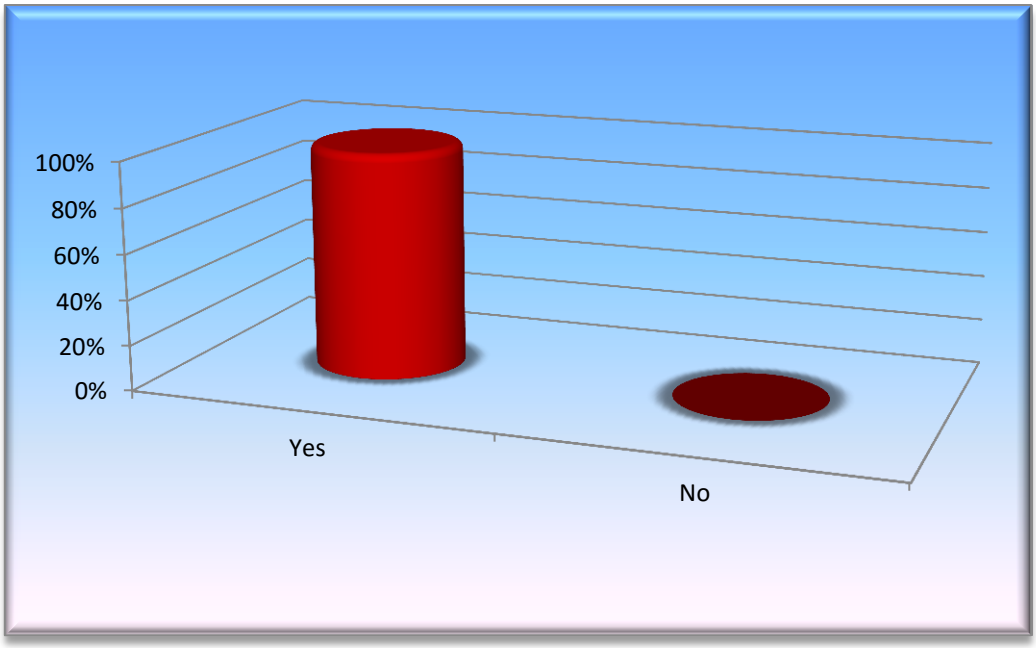

Figure 20 : Teachers' views About the Students' Participance When using Brainstorming

Based on the results of the previous table and figure, it is clarified that all techaers (100%) agreed that students' are more active and participate better when using brainstorming.

Section Two : Intellectual skills and creative thinking développent

Q06 : Do you think that using brainstorming is functional in generating ideas ?

Yes ☐ **No** ☐

Options	Number
Yes	**9**
No	**1**

Table 21: Teachers' Opinion About The Functionality Of Brainstorming In Generating Ideas

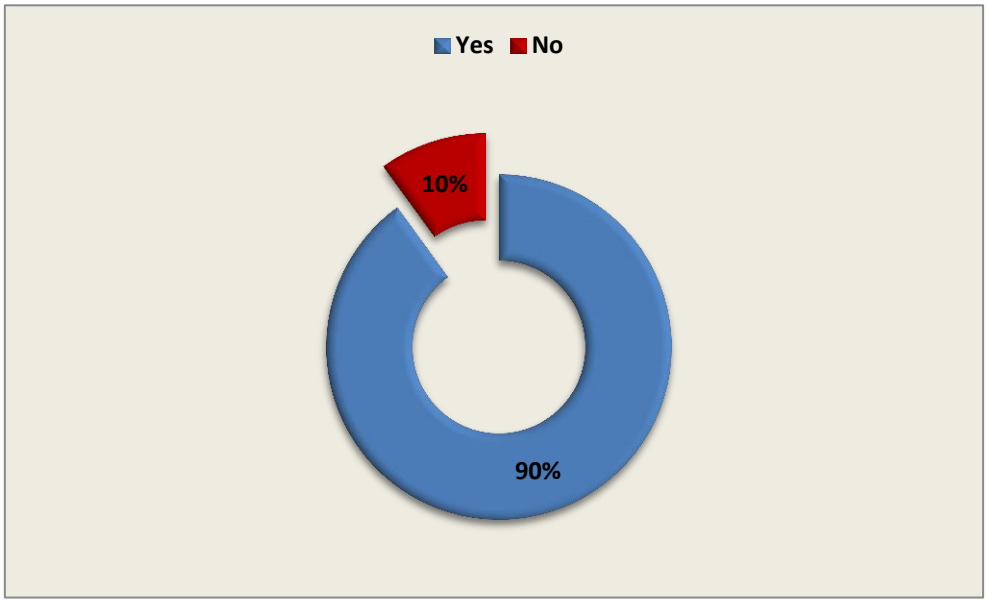

Figure 21 : Teachers' Opinion About The Functionality Of Brainstorming In Generating Ideas

According to the figure above, it is clear that Most of teachers (90%) assume that using the technique of brainstorming is fuctional in the generation of ideas. Whereas, only one teacher disagreed with the idea. Besides, the reason behind asking this quedtion is to know if brainstorming is beneficial for EFL students to generate a high quantity of thoughts.

Q07 : Do you think that students would be more motivated using brainstorming ?

a. **Strongly agree** ☐
b. **Agree** ☐
c. **Disagree** ☐

Options	Number	Percentage%
Strongly Agree	**6**	**60%**
Agree	**4**	**40%**
Disagree	**00**	**00%**

Table 22: Affect Of Using Brainstorming On Students' Motivation

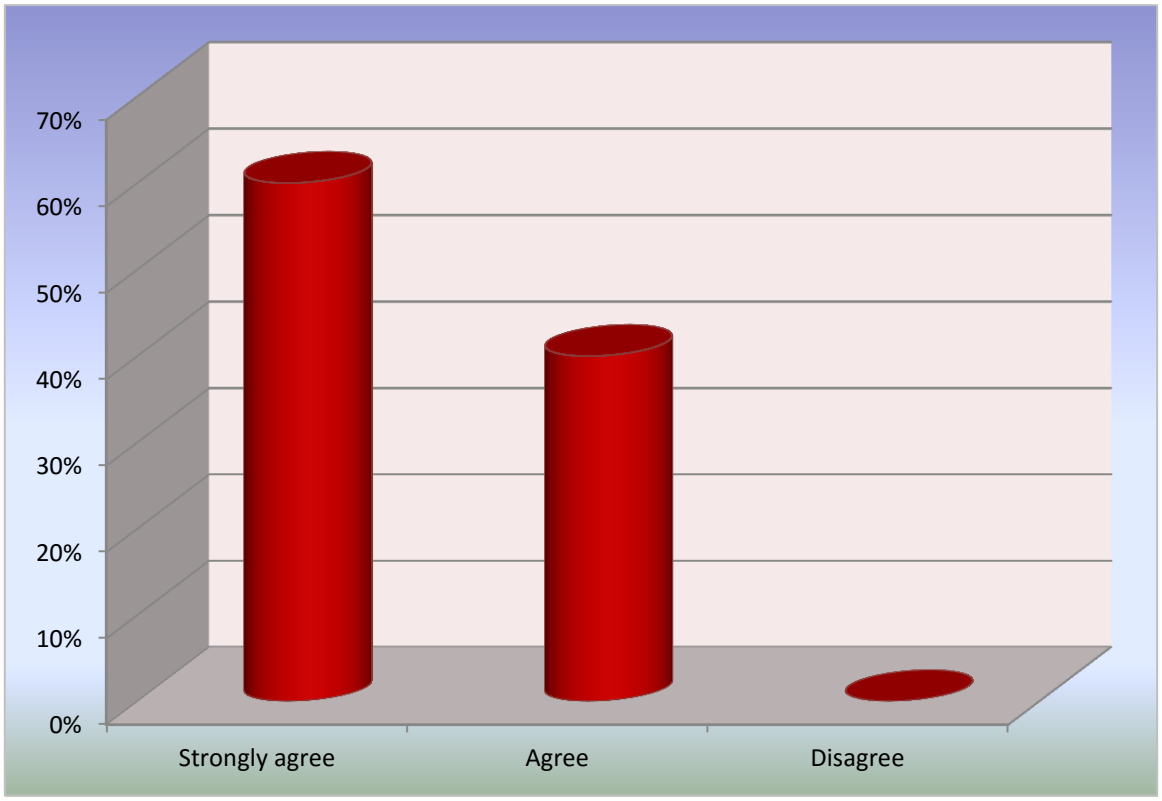

Figure 22 : Affect Of Using Brainstorming On Students' Motivation

According to the graph, (60%) of the participants strongly agreed that brainstorming is a motivational strategy for their studnts. However, 4 other teachers (40%) agree that students are motivated using the technique. Based on both anwers, it is clarified that brainstorming can motivate students when it come to be used suring the session.

Q08 : Would you briefly state the steps you follow for a brainstorming session preparation ?

Teachers answers were as the following :

- I usually start with questions, then introduce the topic, and i usually examine their ideas and give them feedback
- I write the words on the board, then i ask students to give me words related to the main ones. Then they start to mention the related words and ideas in order to get as much answers as we can related to the same topic
- 1. Create the environment for group brainstorming

  2. Identify the problem by outlining the goal of the brainstorming session

  3. Generate ideas

  4. Select ideas and narrow the list of ideas

  5. Make an action plan
- General questions/ easy ones. Then specific. Then straight to the point
- Selecting the topic. Identifying the purpose. Preparing the questions. Preparing material required like ideas, games, songs, pictures…etc.
- I provide them with terms and questions to be explained that are related to the previous session then, i present new topic to them and i again give them other questions that need a connection between the previous knowledge and the new one
- Teachers start by giving the topic or the subject to be written about, then leave them to use their sources (net books, smart phones) then they are asked to gather ideas, brainstorm, organize, outline, then write their firdt drafts.
- a. Ask the question

  b. Giving cues

  c. share the knowledge

- Introduce the topic and define the problem. Let the students express their anwers. Examining all the responces in an open class discussion
- 1. Thinking abiut an idea or a topic
  2. Select possible questions
  3. Analyse these questions and organize them
  4. Think of possible difficulties
  5. Prepare possible responses and feedback

Since this question was preppared to know the main steps that EFL teachers follow in applying brainstorming in the sessions. Hence, based on their anwers above, the main steps followes are : identification of the problem/topic, then try to relate it to the students' previous knowledge and elicite their thoughts, so that they can expand their ideas to to build new ones, then try to build the final sollution to the presented problem.

Q09 : If you were asked about the positive use of brainstorming in improving students' intellectual skills, what would your comment be ?

Teachers	**Anwers**
T01	**It is a crucial aspect that improve the learners' intellectual skills**
T02	**It organizes their ideas. Motivate them to learn and develop their aquisition of new knowledge.**
T03	**It lets students develop the metacognitive skills allong with the critical thinking in the necessary situations**
T04	**So effective and benefical**
T05	**It increases the richness of ideas explored. Find better solutions to the problems that you face in learning**
T06	**Using students to make brainstorming a habitual action in**

	every task, test, exam, project…
T07	**It helps students in generating ideas**
T08	**Tapping on their previous knowledge will enable them to think more, to connect previous knowledge with the incoming one and come up with new one**
T09	**It provides them with possible abilities to think deeply for better pruduct and results**
T10	**The more ideas they generated ; the better knowledge is acheived**

Table 23 : Teachers' perceptions about the positive use of brainstorming in students' intellecual skills' développent

The question aimes to know the teachers' perceptions about the positive use of brainstorming in improving the students' intellectual skills. Besides, teachers' answers prove the effectiveness of using brainstorming and how much this stratyegy is benificial in the students' intellectual skills' development.

Q10 : is brainstorming technique useful to help students in making better decision ?

Yes ☐ **No** ☐

Options	**N**	**P%**
Yes	**10**	**100%**
No	**00**	**00%**
Total	**10**	**100%**

Table 24 : The Usefulness Of Brainstorming In Students' Decision Making

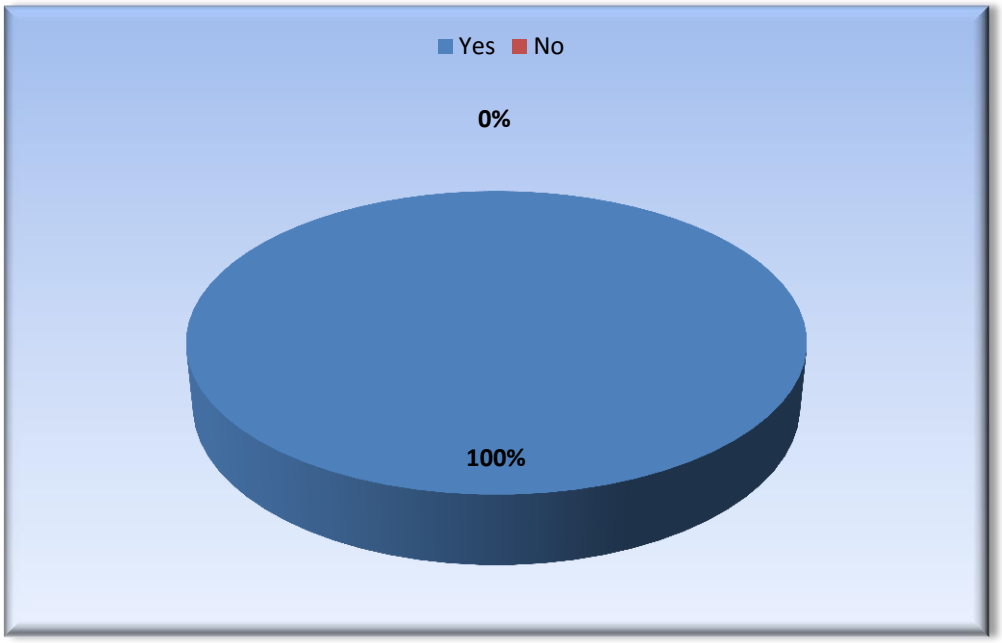

Figure 23 : The Usefulness Of Brainstorming In Students' Decision Making

This question is prepared to collect teachers' opinions about the effect of using brainstorming on students' decision making. According to the figure above the total number of teachers (100%) agreed that the use of brainstorming technique is useful to help their students in decision making. Based on their agreement, it clarified how brainstorming is helpful for students to make decisions and better solutions.

Q11 : Does brainstorming strategy help yo to analyse and evaluate students' ideas ?

Yes ☐ **Some how** ☐ **No** ☐

Options	**N**	**P%**
Yes	**8**	**80%**
Some how	**2**	**20%**
No	**00**	**00%**

Table 25 : Teachers' Opinions Towards Brainstorming As a Helpful Technique In Analysing Students' Ideas

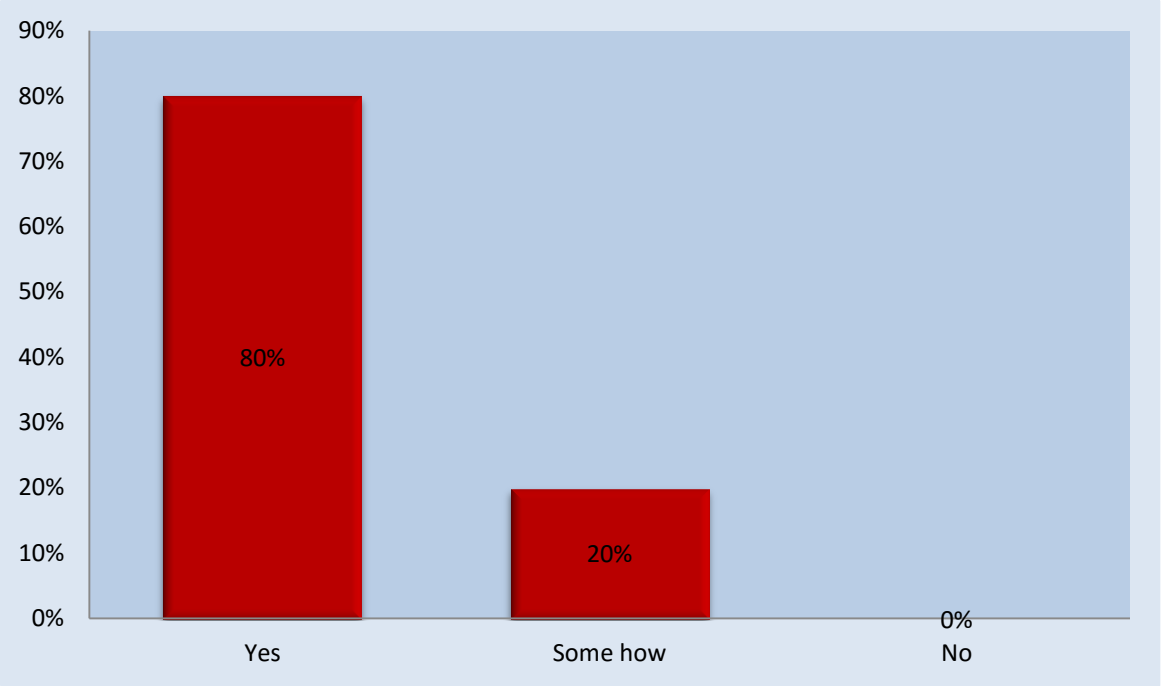

Figure 24 : Teachers' Opinions Towards Brainstorming As a Helpful Technique In Analysing Students' Ideas

Considering that the question was prepared to know whether the brainstomins strategy is helpful for teachers to analyse and evaluate their students' ideas. Based on teachers' anwers, the majority of them (80%) totaly agreed that the technique is helpful for teachers to analyse and evaluate their students' ideas. In the other hand, (20%) of them respond that it is some how helpful. But generaly, this strategy can be helpful and useful for EFL teachers.

Q12 : Do you think that using brainstorming can affect positively the students' thinking abilities ?

Yes ☐ **No** ☐

Options	**Number**
Yes	**10**
No	**00**

Table 26: Teachers' Opinions about the Positive Effect of Brainstorming on Students' Thinking Abilities

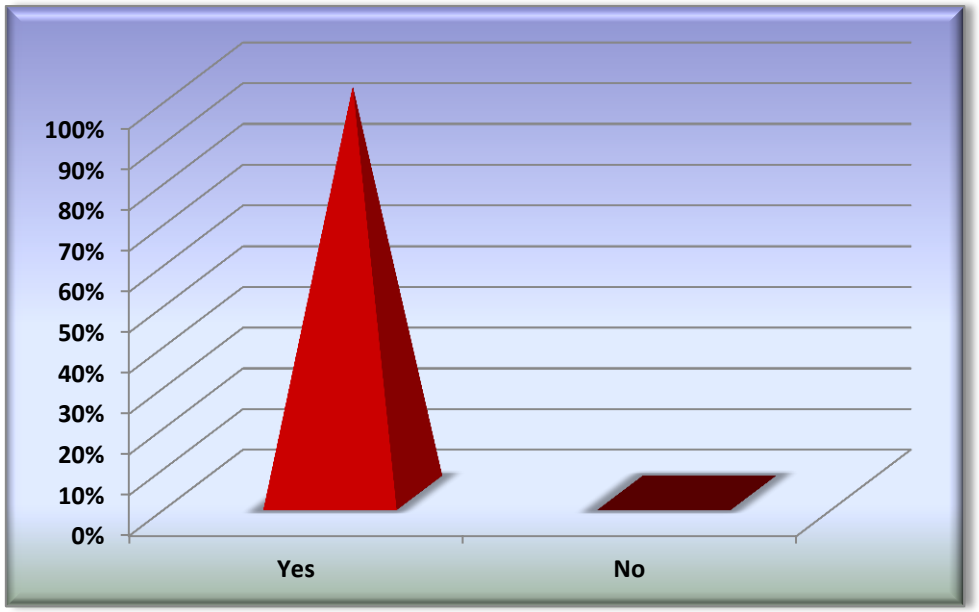

Figure 25 : Teachers' Opinions about the Positive Effect of Brainstorming on Students' Thinking Abilities

Since this question is designed to know EFL teachers' perceptions about the use of brainstorming and whether this strategy can affect positively on students' thinking abilities. According to the participants' anwers, all of them (100%) agree that this technique is beneficial for the improvement of EFL students' thinking abilities.

Conclusion

This chapter provides analysis of the data collected from both the learners and teachers questionnaires. The findings from the questionnaires were analyzed quantitatively and qualitatively and presented in the form of tables, texts and figures. This questionnaire revealed that brainstorming strategy has a great impact in developing students' intellectual skills. Therefore the majority of our participants agreed on its effectiveness on developing students' intellectual skills.

Chapter Five: Discussion

Introduction

This chapter is concerned with the discussion part of the research. It includes the discussion of the obtained results from both questionnaires in order to prove or disprove the previously stated research hypotheses. It also provides pedagogical implications of the research as well as some recommendations for students, teachers, and further studies.

Discussion of Hypotheses

Hypothesis One

The development of students' intellectual skills is an essential requirement in EFL classrooms. In this study it is hypothesised that brainstorming helps in improving EFL learners' intellectual skills. This suggestion has been proved through both teachers and students questionnaires' analysis. The participants' answers and opinions show an agreement with the successful use of brainstorming strategy in EFL settings, which validates the hypothesis.

Hypothesis Two

The second hypothesis of this study suggests that if teachers use brainstorming as a teaching strategy, students' intellectual skills will be developed. It has been confirmed through the analysis of both teachers and students' questionaires. The participants' answers provide a strong agreement about the positive effect of brainstorming in developing students' intellectual skills, which affirm the hypothesis of the study.

Hypothesis Three

The other hypothesis of the research study is that EFL students and teachers have good perceptions and positive attitudes towards the impact of using brainstorming on EFL students'intellectual skills. And this is confirmed with the analysis of teachers and students' questionnaires answers of the participants who use the strategy as a tool which helps to

develop learners' thinking abilities and improve their intellectual skills. And this valides the research hypothesis.

Limitations of the Study

We confronted some limitations during our research. The first limitation is time ; it has been difficult to use a method other than descriptive because of the short time frame given for the thesis. The second limitation of the study is the number of participants ; it was difficult to find the only 30 students who responded to our questionnaire, which lead to a delay in completing our practical part of the thesis.

Discussion of the Findings

The findings of the students' questionnaire clearly show that the majority of students are aware about the brainstorming strategy. Whereas, most of them encounter some difficulties when solving problems, which are mostly because of the lack of prior knowledge. In addition, most of the students agreed that they use the brainstorming technique during problem solving. Although, most of them confirm that they are not encouraged by teachers to use the strategy. Further, when using the strategy, the majority of participants stated that they prefer to brainstorm individualy rather than in groups. Besides, based on the students' views, brainstorming individualy makes them more creative in thinking during the problem solving. In the other hand, most of the participants' answers show that brainstorming technique is useful and effective in improving their creativity in problem solving and generation of ideas, as well as most of them agreed that the strategy inhances their motivation too. Based on the learners' answers of the questionnaire, it is ensured that brainstorming is seen as a functional tool for generating ideas, as well as it is important and beneficial for developing students' intellectual skills. Students confirmed that for a successful brainstorming there are several steps that should be followed during the sessions.

The results obtained from teachers' questionnaire reveal that brainstorming is usually used by EFL teachers during classroom sessions. Besides,it is a useful strategy that helps to activate their students' prior knowledge which makes them able to connect their knowledge to the new related information. Thus, students' critical thinking level would be developed. Most of the teachers prefer their students to brainstorm both individualy and in groups, in a way that when students brainstorm individualy they can depend on themselves and express their own thoughts. However, when brainstorming in groups they will be able to relate their thinking to others' ideas to produce new and original solutions in less time. As a result, they would be more active during the classroom sessions. Thus, brainstorming is a motivational strategy that affects positively the students' ability of idea generation. However, this technique should be applied following different steps. The obtained results confirmes the positive effect of using brainstorming in the improvement of students'thinking abilities and intellectual skills. As well as it is helpfull for teachers analysis and evaluation of their students ideas. Based on teachers' perceptions about the use of brainstorming, all of them confirm the effectiveness of using the strategy on the development of EFL students' intellectual skills.

The relationship of the findings to previous research and studies

The current study's results and findings are almost similar to some previous studies that we have mentioned before (chapter two). Starting by, the explored study by Patel (1988) about "the development of a Brainstorming technique program and its impact on secondary school adolescents' creativity." The primary goal of the study was to develop a method for the Brainstorming technique and analyze its impact on the creativity levels of secondary school students. He concluded that the Brainstorming technique procedure was beneficial for stimulating verbal and figurative creativity.

Al-Mutairi (2015) conducted a study to examine the usefulness of brainstorming strategies in developing creative problem solving skills among male students in Kuwait. The

study's results indicated that brainstorming strategies were more effective than traditional teaching methods. In addition to Al-Mutairi's study, Al-Khatib (2012) investigated the effect of the Brainstorming technique on the development of creative problem-solving skills in female students at Princess Alia University College. The study found a significant positive effect and advised faculty members to use the Brainstorming technique in their teaching for better results.

Pedagogical Implications

This research work is concerned with shedding light on the positive effect of brainstorming strategy on enhancing and developing students' intellectual skills. Based on the study findings, both teachers and students conceder brainstorming as a suitable strategy to improve teaching and learning processes.

According to the participants answers, it has been noticed that students fully aware about the benefits of brainstorming and its importance in problem solving. It allows them to enhance their creativity.

The analysis shows that brainstorming helps learners to generate various ideas related to the topic. Moreover, teaching by using brainstorming strategy is the best way for students who face difficulties while solving problem.

Recommendations

The present study is an attempt to describe EFL learners and teachers opinions regarding the discovery of the impact of using brainstorming strategy in developing students' intellectual skills. Based on the results, a set of recommendations should be established.

Recommendations for students:

- Students should be aware of the importance of using brainstorming strategy in the development of their intellectual skills.
- Brainstorming should be practiced by students even outside the classroom.

- Students should be knowledgeable about the main steps that they used during a brainstorming session.
- It is important for students to share their ideas and thoughts with their classmates.
- Students should focus on developing all the language skills not only intellectual.
- By using a brainstorming strategy, students should be able to develop new thinking skills like summarizing, planning, memorizing…

Recommendations for Teachers:

- It is an essential point that teachers should choose the appropriate type of brainstorming that allow students to be more engaged in the learning process.
- The teachers should take into consideration his/her students' preferences and needs when using brainstorming strategy in order to make them motivated and not get bored from the session.
- Teachers should raise their learners' awareness about the importance of intellectual skills and critical thinking.
- Teachers should use more group work with different activities.
- Teachers should give students enough time and instructions to brainstorm, and they should do it on regular basis.
- The teachers are suggested to use this strategy in order to help students more active in class.

Recommendations for Future Studies:

- Future studies can be done on the introduction of the relationship between brainstorming strategy and the process of thinking.
- Exploring the effect of using brainstorming on developing students' intellectual skills.
- Conduct an experimental study to investigate the impact of teaching with brainstorming on EFL learning on developing learners' intellectual skills.

- Researchers should select a topic that is valid, new and interesting.
- Future studies are required to shed the light on the importance of brainstorming in facilitating the learning and teaching process.
- Conduct a similar study of the current study to find out the impact of brainstorming strategy at different levels.
- Researcher may suggest others methods to develop the intellectual skills.

Conclusion

This chapter revolves around the discussion of the hypotheses and the findings that we have collected from teachers and students' questionnaires. It also provides a series of implications and it has been concluded by suggesting different recommendations for students, teachers and future studies.

The obtained findings confirmed that EFL students' intellectual skills can be developed troughout the use of brainstorming stratrgy during classroom sessions. Most of the students were aware about the strategy and how it can be applied and practiced in classes. The results declared that using brainstorming is helpful and effective for students' thinking abilities improvement. Further, it is a useful tool for promoting their abilities of creativity during problem solving.

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Appendicies

Appendicies

Appendix A

Students' Questionnaire

Dear teachers,

This questionnaire is designed to gather data as part of a research work carried out in the framework of a Master degree. It aims at investigating the impact of teaching with brainstorming and its role in developing intellectual skills.We would be very grateful if you take a part in this questionnaire.

Please answer each statement by ticking(X) in the corresponding box and make a full statement whenever necessary.

Thank you in advance for your collaboration.

Section One : Brainstorming strategy

Q01 : Do you consider brainstorming is useful in activating students' previous knowledge ?

Yes ☐ No ☐

If yes, what are the benifits of calling up their prior knowledge ?

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……

Q02 : Do you use the brainstorming strategy in your classes ?

Yes ☐ No ☐

If yes, do you use it : a. usually ☐

b. some times ☐

c. rarely ☐

Q03 : Do you think that brainstorming is effective in improving students' critical thinking ?

Yes ☐ No ☐

Q04 : Do you prefer your students to brainstorm :

a. Individualy ☐

b. In groups ☐

c. Both ☐

Whatever your answer , please justify your answer.

……

……

……

……

……

Q05 : Do students participate and be active while using the brainstorming strategy ?

Yes ☐ No ☐

Section Two : Intellectual skills and creative thinking development

Q06 : Do you think that using brainstorming is functional in generating ideas ?

Yes ☐ No ☐

Q08 : Do you think that student would be more motivated using brainstorming?

a.Strongly agree ☐

b.Agree ☐

c.Disagree

Q09 : Would you state the steps you follow for a brainstorming session preparation ?

……

……

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……

…… ……...

Q10 : If you were asked about the positive use of brainstorming in improving students' intellectual skills, what would your comment be ?

……

……

……

Q11 : Is brainstorming technique useful to help students in making better decision ?

Yes ☐ No ☐

Q12 : Does brainstorming strategy help you to analyse and evaluate students' ideas ?

Yes ☐ Some how ☐ No ☐

Q13 : Do you think that using brainstorming can affect positively the students' thinking abilities ?

Yes ☐ No ☐

Thank you for your collaboration ☺

Appendix B

Students'Questionnaire

Dear students,

This questionnaire is designed to gather data as part of a research work carried out in the framework of a Master degree. It aims at investigating the impact of teaching with brainstorming and its role in developing intellectual skills. We would be very grateful if you take a part in this questionnaire.

Please answer each statement by ticking(X) in the corresponding box and make a full statement whenever necessary.

Thank you in advance for your collaboration.

Section One : Brainstorming strategy

Q01 : Are you aware about the brainstorming strategy ?

Yes ☐ No ☐

Q02 : Do you face difficulties while solving problems ?

Yes ☐ No ☐

Q03 : Are those difficulties because of :

a. Lack of prior knowledge ☐

b. The misunderstanding of the problem topic ☐

c. Others ☐

State them …… …….. …… ……..

……...

Q04 : Are you encouraged by your teachers to use use the brainstorming straregy ?

Yes ☐ No ☐

If yes, how ? ……

…….

Q05 : Do you use brainstorming technique to solve problems inside the classroom ?

Yes ☐ No ☐

Q06 : Do you prefer to brainstorm :

a. Individualy ☐

b. In groups ☐

c. Both ☐

Please, justify…. ……

…….

Q07 : Do you find brainstorming as a strategy to improve your creativity and problem solving : **a.** effective ☐

b. useless ☐

Q08 : During a brainstorming session, do you generate a lot of ideas about the topic ?

a. Yes, quickly ☐

b. Yes, but some how ☐

c. No, i have a problem of being blocked ☐

Q09 : Do you think that students would be more motivated using brainstorming?

a. Strongly agree ☐

b. Agree ☐

c. Disagree ☐

Section Two : intellectual skills and creative thinking development through using brainstorming

Q10 : Do you know what intellectual skills are ?

Yes ☐ No ☐

Q11 : Do you think that the use of brainstorming strategy is functional in generating ideas ?

Yes ☐ In some cases ☐ No ☐

Q12 : Do you think that using brainstorming in classroom sessions would develop your thinking and intellectual skills ?

Yes ☐ No ☐

Please, justify… …… ……. …… …….. ……..

…… ..

Q13 : Are you aware about the benefits of brainstorming fo creativity and intellectual skills' improvement ?

Yes ☐ No ☐

Explain… …….. …….. ……

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Q14 : Would you state the steps you follow to brainstorm in order to generate ideas, please ?

….. …… ……. …..

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Q15 : Do you think that brainstorming should be encouraged at chadli Bendjedid University, espicialy in EFL classes ?

Yes ☐ No ☐

Thank you for your time and help☺