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THEME:

“CONVERGENT AND DIVERGENT THINKING IN THE MEANINGFUL LEARNING OF THE ENGLISH LANGUAGE FOR HIGH SCHOOL STUDENTS OF THE THIRD YEAR OF BACHELOR AT THE DR. FRANCISCO CAMPOS COELLO PUBLIC HIGH SCHOOL IN GUAYAQUIL DURING THE FIRST QUIMESTRE OF THE SCHOOL YEAR 2013-2014”

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QUITO, 2013

APPROVAL SHEET

We, Lic. M.A Patricio Serrano, Director and Lic. Mg. Rocío Ortega, Co-director duly certify that the thesis under the title: “CONVERGENT AND DIVERGENT THINKING IN THE MEANINGFUL LEARNING OF THE ENGLISH LANGUAGE FOR HIGH SCHOOL STUDENTS OF THE THIRD YEAR OF BACHELOR AT DR. FRANCISCO CAMPOS COELLO PUBLIC HIGH SCHOOL IN GUAYAQUIL DURING THE FIRST QUIMESTRE OF THE SCHOOL YEAR 2013-2014” was carried out by Keydi Eunice Salgado Elejalde, and has been reviewed and analyzed, and consequently its presentation is authorized as a legal document in order to get the Bachelor’s degree.

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Keydi Salgado Elejalde

DEDICATORY

To God who gave me the necessary health, strength and courage to finish my studies. To my mother Martha Elejalde de Salgado who did everything what she could for me. Her love, understanding, empathy, smile, words, advice and her constant motivation, perseverance, constancy, positivism, values and happiness have been a motivation and a source of inspiration and example in my life.

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ABSTRACT

The purpose of this investigation was to determine if the implementation of convergent and divergent thinking techniques promotes the meaningful learning in the classroom, and also to encourage teachers to become more interested in applying new methods and techniques. The students were observed using checklists for classroom observations to analyze and determine which of the learning activities that were used to work in class belonged to convergent and divergent thinking. Students were then introduced to new class activities; they worked for a week with activities like: mind mapping, brain storming, free writing, creating dialogs and questions and other activities that belonged to convergent and divergent activities. There were two groups that were considered for the proposal: a control group and an experimental group and the effectiveness in the classroom was measured by means of a pre-test and a post-test. The results were then focused to determine if there was any incidence of convergent and divergent thinking in the meaningful learning in the classroom.

KEY WORDS:

Convergent thinking

Divergent thinking

Meaningful learning

Classroom

Methods

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This research is part of one initiative to contribute to society by proposing alternative solutions to the various problems that our Ecuadorian education is facing especially those related to the English language area.

The importance of this research is based on the fact that education needs innovation according with the technological development that is taking place every day and takes advantage of new methodological trends in order to create learning situations that are dynamic and innovative for our students.

The first part of this thesis includes everything related to the problem identification, formulation of the main and secondary problems, setting of objectives, working variables and working hypothesis.

The second part has all theories and concepts that give the scientific support to the dependent and independent variables, the theoretical framework is divided into four chapters: chapter one is about convergent and divergent thinking; chapter two: meaningful learning; chapter three: convergent and divergent techniques and activities and chapter four: the learner as a main goal.

The third part specifies the type of research, the methods and techniques used for data gathering and the procedures to process the information.

The fourth part becomes the most important section because it is here where the hypothesis is tested, some graphical expositions for the analysis are also presented and a statistical summary is found here.

The last part presents the proposal to contribute with alternative solutions to the problems that this high school is facing.

PART ONE

RESEARCH PROBLEM

1 PROBLEMATIZATION

The public high school: “Francisco Campos Coello” located in the city of Guayaquil: La Atarazana mz. F2, F3 has a population of 1109 students, 57 teachers and 23 administrative personnel. It has two sections: morning and afternoon, which follow the curriculum model provided by the Ministry of Education. Several classroom observations were directed to students of the third year of bachelor to get valid data for this research. There are 373 students (143 men and 227 women), its own administrative and teachers personnel.

Teachers have adapted the teaching program called “Postcard” selected by the Ministry of Education to work in the English area, which is valid for every year.

In this regard, and to strengthen the research that was developed, the information obtained from the class observations was analyzed and interpreted to establish the problematical situation in this high school, which was summarized in the following way:

There is an evident lack of innovative teaching methodology; teachers share their instruction by applying the most common methods used for years in the teaching practice.

It was concluded with the classroom observations that teachers are not experimenting with new instructional methods to support deep learning: it is clear

that teachers have a good knowledge of old methods, nevertheless, education is changing according to the demands of the globalized world. It is important to recognize that not all teachers have the knowledge, experience and skills to implement new technologies or theories to change their teaching practices.

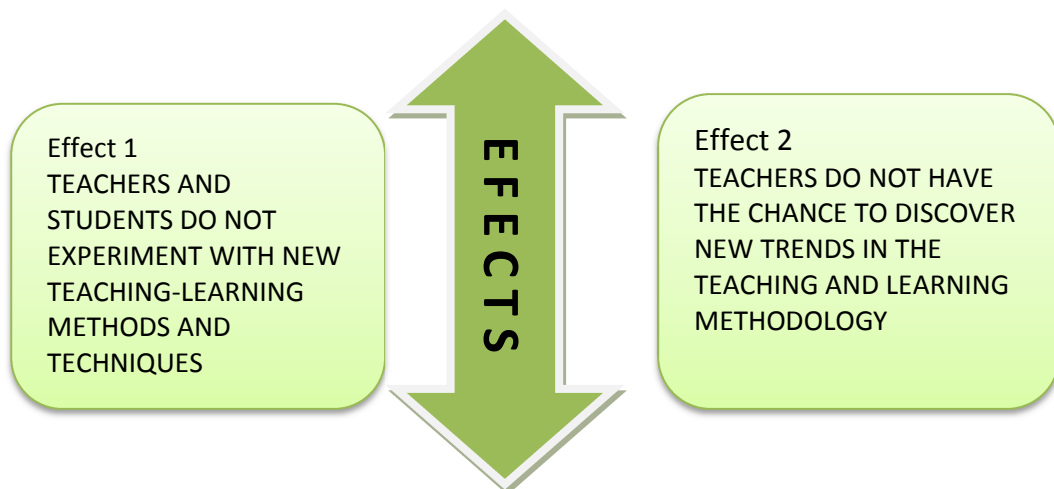
From evolution and advances, which on the teaching of this language have been done over the last few years, it can be concluded that there are many differences in the way of teaching the English language. The various investigations that have been made on the subject and technology advances for teachers incorporate new tools and strategies that assure us that our students are learning according to the present competitive world. The technology and science progress daily and consequently yield important transformations in the educational system.

Thus, because of the dizzying expansion of globalization and the arrival of the computer revolution, learning English has become a necessity to meet short-term goals.

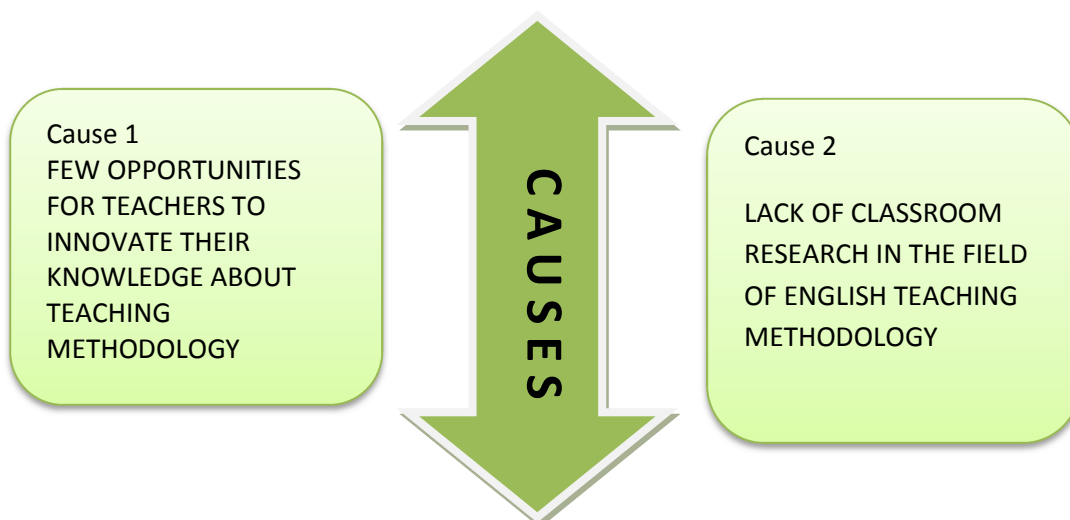
All this shows that the English language has become one of the most used in the world in almost all areas of knowledge and human development.

The English teachers in this high school are not experimenting with new tools and teaching strategies that can really promote the acquisition of the English language by students in an effective way.

1.1 PROBLEM SETTING



Lack of convergent and divergent thinking activities in the English classroom



1 Tree problem

MAIN PROBLEM

Lack of convergent and divergent thinking activities in the English classroom

SECONDARY PROBLEMS

What should teachers know about convergent and divergent thinking to promote the meaningful learning in the English language classroom?

What are the most appropriate methods and techniques to promote the meaningful learning in the English language classroom?

How to plan the lessons to incorporate convergent and divergent thinking in the English classroom and how to promote the meaningful learning?

1.2 WORKING VARIABLES

INDEPENDENT	DEFINITION	DIMENSION	SUB-DIMENSION
Convergent and Divergent thinking	Convergent thinking	Critical thinking methods	Reasoning
	According to Hudson (1967), Convergent thinking is the act when a student brings materials or ideas to contribute to a problem and generate the correct answer.		Analyzing
Decision making			
Problem solving			
	Divergent thinking	Creative thinking	Evaluating
			Evolution

Continue...

INDEPENDENT	DEFINITION	DIMENSION	SUB-DIMENSION
	According to Smith (2012), here the student needs to be very creative to elaborate ideas generated by a stimulus.	methods	Changing direction
			Reapplication
			Revolution
			Synthesis
	Ideas generation may be possible by applying several	Convergent techniques	Multiple choice
	techniques such as brainstorming in which the idea is featured in several directions to lead to one or more ideas.		True or False
			Filling in the blanks
			Matching
			Listing
			Identifying
			Comparing & contrasting
			Ranking
		Divergent techniques	Open ended questions
			Brainstorming
			Creating questions
			Creating dialogs
			Telling stories

Continue...

DEPENDENT	DEFINITION	DIMENSION	SUB-DIMENSION
Meaningful learning	According to Hassard (2011) it refers to the concept that the acquired knowledge is fully understood by the student and that the individual knows how a specific fact relates to other stored facts. In other words, the information recently acquired by the student is tied into his/her previously materials and is immediately useful to build knowledge.	Components of meaningful learning Active Constructive Intentional Authentic Cooperative	Learning by doing Using real world context Self-directed learning Engaging prior knowledge Collaborative learning Lesson planning Cyber wellness

1.3 OBJECTIVES

General

To develop a study that provides wider ideas about the incorporation of convergent and divergent thinking in the English classroom to promote the meaningful learning on the students of the third year of Bachelor at “Dr. Francisco Campos Coello” high school in Guayaquil during the first quimestre of the school year 2013-2014.

Specific

To select the most appropriate theories, concepts, techniques and activities to develop an experiment with convergent and divergent thinking with the students of the third year of Bachelor at “Dr. Francisco Campos Coello” high school in Guayaquil selected as the sample of the investigation.

To design lesson plans for the experiment that incorporate the methods and techniques immersed in the convergent and divergent thinking.

To select the best instruments for gathering information from the different sources implicated in the investigation.

To propose new alternatives about the implementation of convergent and divergent thinking to promote the meaningful learning in the English classroom on the students of the third year of Bachelor at “Dr. Francisco Campos Coello” high school in Guayaquil during the first quimestre of the school year 2013-2014.

1.4 JUSTIFICATION

We are living in a world where globalization demands people adopt new positions in the way they currently do things. It means they must develop or acquire new strategies that help them to perform better in all fields: familiar, professional and social.

The English Language has become one of the most spoken around the world, that is why English is considered a universal language. In fact, English teachers must possess certain skills and abilities that really promote students to acquire the language and use it in real and effective communication.

This research is directed to encourage teachers to adopt the convergent and divergent thinking as a new strategy to promote the meaningful learning in the classroom and that students have a better achievement at the end of the instruction. Teachers will have in their hands a set of tips and strategies to assure their success in the adoption of this new proposal which is based on thinking strategies.

This investigation also seeks to encourage English teachers to develop classroom research and have the opportunity to discover new things which can be applied in their teaching practices with the purpose that not only teachers take part of the language evolution but also students. When a teacher is conscious about the importance of investigating the English language, he/she will be willing to spend the necessary time and make all the effort to accomplish the professional development goals.

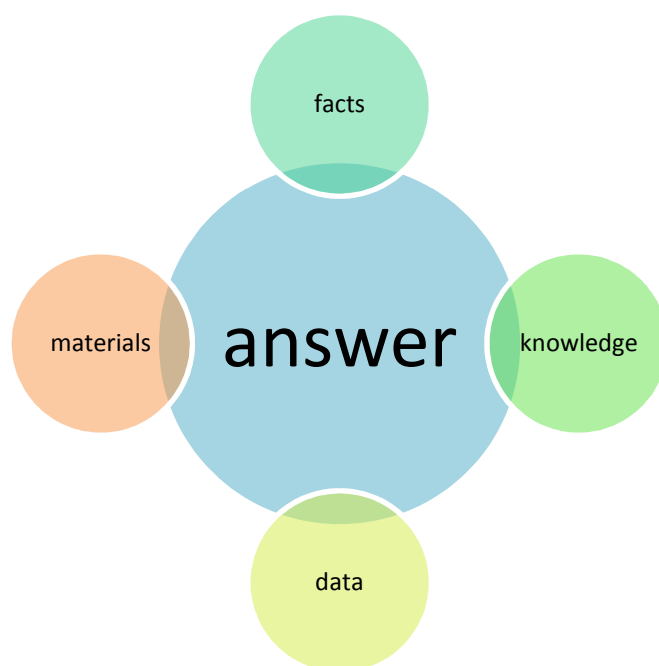
As an undergraduate student preparing myself to get my bachelor degree and become a new teacher, this project helps me fulfill my graduation requirements and develop some research skills which will be useful when I carry out my teaching practices in the future.

PART TWO

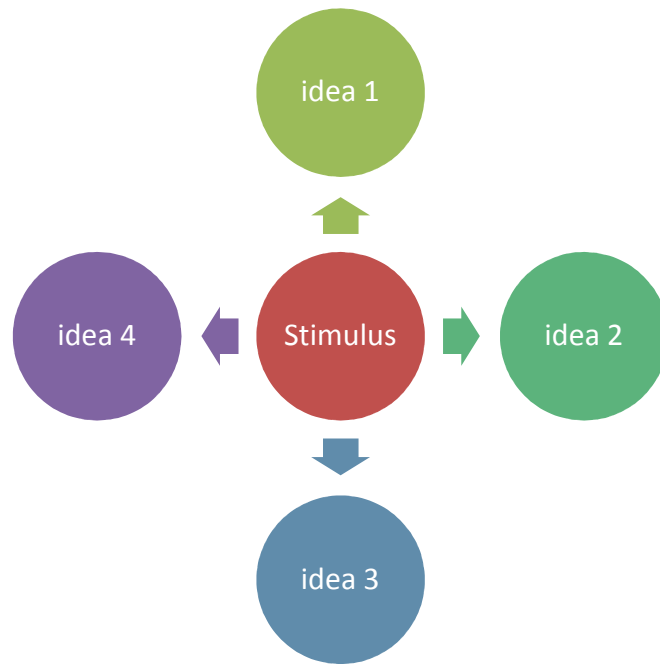
2 THEORETICAL FRAMEWORK

2.1 CHAPTER ONE: CONVERGENT AND DIVERGENT THINKING

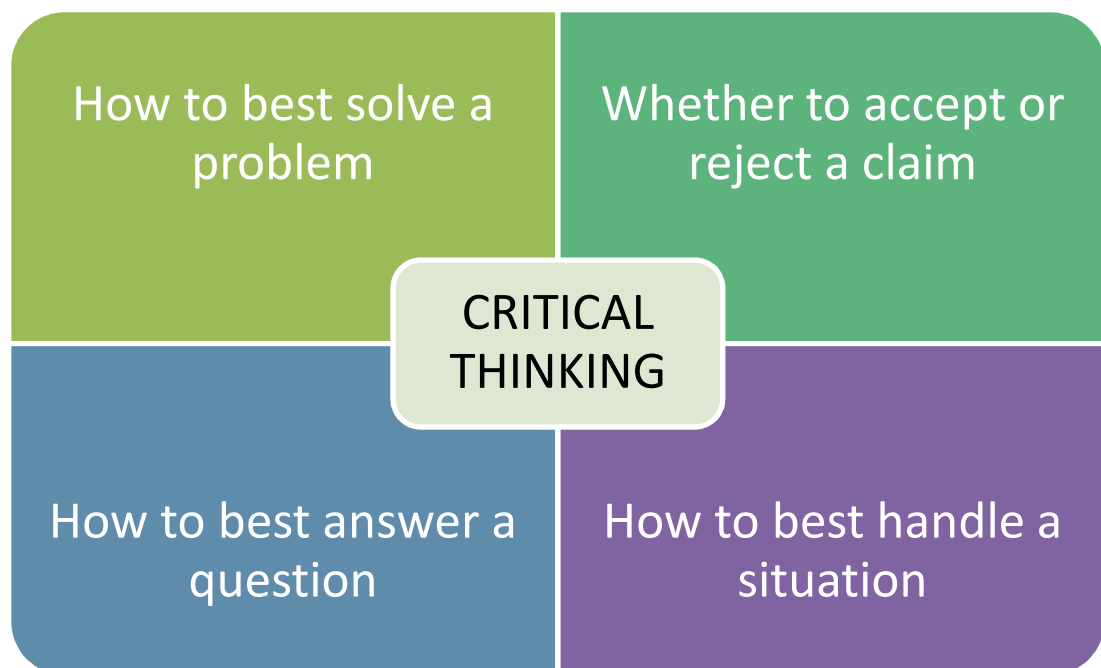
(Bernhard, 2012) holds that students use their previous knowledge to try to solve a situation with convergent thinking. They choose the best solution or alternative from a group. Students use convergent thinking with many of the tasks they are assigned and on standardized tests where they determine the correct answer. It is a “left-brain” process or logical one.



According to (Gibson, Foley, 2008), divergent thinking implies the exploration of diverse creative ideas with the intention of creating many new possible solutions. In the divergent thinking it is the right brain which contributes with the creative process.



2.1.1 CRITICAL THINKING METHODS



Education is changing every day and for the 21st century teachers need to be conscious that to be successful in the education process, students must develop effective thinking skills to apply their knowledge on diagnosing and solving problems, to ask appropriate questions and to be able to select appropriate resources, learn and understand the rules and principles of the learning process.

Students must have basic knowledge of the subject they are studying and know how to retrieve additional knowledge if it is necessary. In other words, students must develop the skills to use their knowledge in meaningful ways.

According to (Fishers, 1998) in convergent and divergent thinking it is important that teachers make students think even when they do not want to. Students must develop their knowledge so they can solve problems, think creatively and critically, make decisions, generate new ideas, analyze information and plan for the future.

2.1.1.1 REASONING

(Evens, 2004) holds that reasoning is the stage where educators teach students how to look for general patterns and then make generalizations about typical structures. This is a thinking process in which students figure out how things and facts are alike or different by means of analyzing the patterns and reasoning them; they identify and compare specific elements, select appropriate and important characteristics for the solution of a problem.

It can be said that reasoning is a taught process which involves logic in order to avoid making arbitrary decisions. Students must develop their capacity to consciously make sense of things in order to establish and verify facts. Reasoning is associated with thinking cognition and intellect.

Based on Wise geek, (anonymous, 2007) it is possible to say that there are two types of reasoning: deductive reasoning, which is one of the basic forms of valid reasoning which begins with a general hypothesis or known fact and then the creation of a specific conclusion from that generalization. This is the opposite of inductive reasoning, which involves creating a broad generalization from specific observations. The basic idea of deductive reasoning is that if something is truth of a class or things in general, this true applies to all members of that class. One of the keys for deductive reasoning then is to be able to properly identify the members of that class; incorrect categorizations will result in unsound conclusions.

2.1.1.2 ANALYZING

Wynne (2008) affirms that analysis enables students to use the acquired and stored knowledge in their brain to compare or contrast it with the information that they are receiving to accept or reject it and draw their own conclusions.

It is a process where learning is analyzed to help students identify where they are in terms of their knowledge skills and competences, versus where they wish to be according to their learning goals.

There is a need analysis for English teachers which is not the same as the analyzing technique but that has some relation because it allows to know the learning needs of their students. These actions determine their weaknesses and strengths and the gaps among the existing skills , knowledge and abilities and those that are needed to accomplish the desired level.

According to Cook (2009) need analysis is a cycle and it is relevant to identify learning problems that are affecting our students. Teachers must follow certain steps

and it is advisable to achieve them at the beginning of a program or scholar period.

The steps are presented in the following graphic:



2.1.1.3 DECISION MAKING

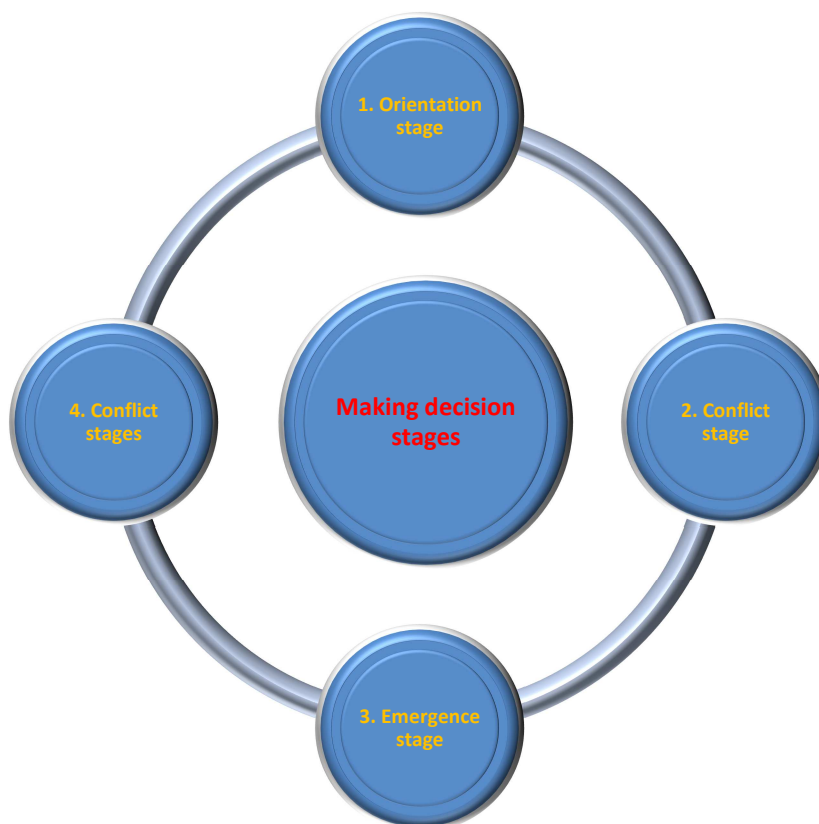
(Armesh, 2011) points that making decisions in education is very important because it is the act where decisions are taken and it demands a continuous mental process integrated in the interaction with the environment. Through decision making teachers can select the most effective methods and techniques to provide learners with alternatives to develop their communicational skills in the language. Making decisions will assist teachers in deciding or determining when to act on a problem which finishes when a satisfactory solution is reached.

In teaching, there are many decisions we must take with responsibility to favor our students in several aspects such as: teaching methods and techniques, problems

with behavior, students' motivation, classroom interaction, classroom management, evaluation, etc. There are other decisions that cannot be mentioned now because it would take a lot of time but the important point is that decisions need to be taken on time.

Talking about learning, students must make decisions all the time to assure their success in the process of acquiring knowledge and developing skills and abilities.

It is important to remember that decisions can be made individually or in group to develop and generate new and unique ideas, views and opinions. In other words, it is a process of selecting the best course of action from many alternatives. Next, we designed a graphic to indicate the stages of decision making developed by B. Aubrey Fisher for group decisions.



Orientation stage – This phase refers to the time and place when and where members meet for the first time and start to get to know each other.

Conflict stage – Once group members become familiar with each other, disputes, little fights and arguments occur. Group members eventually work it out.

Emergence stage – The group begins to clarify vague opinions by talking about them.

Reinforcement stage – Members finally make a decision, while justifying themselves that it was the right decision.

Then, we based on some information found in this web page: http://en.wikipedia.org/wiki/Decision_process, which is supported with the work by Rest, designed a graphic to present the steps of making moral decisions:



1. Establishing community: creating and nurturing the relationships, norms, and procedures that will influence how problems are understood and communicated. This stage takes place prior to and during a moral dilemma.
2. Perception: recognizing that a problem exists.
3. Interpretation: identifying competing explanations for the problem, and evaluating the drivers behind those interpretations.
4. Judgment: sifting through various possible actions or responses and determining which is more justifiable.
5. Motivation: examining the competing commitments which may distract from a more moral course of action and then prioritizing and committing to moral values over other personal, institutional or social values.
6. Action: following through with action that supports the more justified decision. Integrity is supported by the ability to overcome distractions and obstacles, developing implementing skills, and ego strength.
7. Reflection in action.
8. Reflection on action.

There are some decisions, when it is actually possible to mix these things up and, of course, this will simply cause confusion and may make waste a lot of time.

It is recommended by (Decision Making Confidence) that when making decisions we should list all the options as well as our criteria in order to sort out the best path to take. And there are many decision making tools and techniques designed for this purpose, decision trees, decision matrix, decision risk matrices, spreadsheet and database analysis programs and so on.

2.1.1.4 PROBLEM SOLVING TECHNIQUE

According to what is stated in the web page: <http://www.answers.com/topic/learning-problem-solving#ixzz2Oqr1HVi5> problem solving skills are an important factor in academic success. It is a critical skill to learn how to solve a problem because students think in constructive ways to respond to different situations.

The International Child and Youth Care Network (2005) holds that effective problem solving techniques will assist students in avoiding conflict with others in a school setting and in everyday lives.

When we mention problem solving, we do not only refer to school conflicts with other students, but we also mean to solve problems related to learning such as motivation, attitude and development of language skills, etc.

In order to work out the Problem solving stage, it is necessary to follow this procedure:

- Identify the problem
- List the possible solutions
- Weigh the possible solutions
- Choose a solution to try
- Put the solution into practice
- Evaluate the solution

Identify the problem

As teachers it is really important to know when we are dealing with a real problem and not its symptoms. In this step, the teacher or students must look at the issue from a variety of perspectives in order to find out keys that collaborate with us to discover which the causes that are originating the problem are.

List the possible solutions

When we have defined what we are trying to solve, it is necessary to list the possible solutions and to consider that it is an opportunity to learn. We must analyze and discover facts to find out what we know about the situation.

There are three questions we can formulate to get the correct information and set the most appropriate solutions:

- Who knows? About the situation/opportunity or has information we need to solve it.
- Who cares? That something is done about it.
- Who can? Do something about the solution.

After we answer these three questions, we can create solutions placing a high value on the ideas we have. We can base our list of possible solutions on the power of our positive thinking in order to get significant results.

Choose a solution to try

The next step in the problem solving technique is to consider the number of solutions found. It is likely that more than one will be viable, so how do you decide which solution to select? There will be constraints restricting what we can do, issues

about whether solutions fit within what is currently done, and various stakeholders views to consider.

In this step, we need to take our time to answer the following questions which will ease enormously to choose the best solution:

- **Operational validity** - Can you take action on this idea, or can you only talk about it? Can you really do something right away to bring about the kind of future you desire?
- **Economic validity** - Will the idea produce economic result? What would be the early indicators that it was working?
- **Personal commitment** - Do you really believe in the idea? Do you really want to be that kind of people; do that kind of work, and run that kind of business?

Effective problem solving requires a controlled mixture of analytical and creative thinking.

Analytical or logical thinking refers to skills such as: ordering, comparing, contrasting, evaluating and selecting. It provides a logical framework for problem solving and helps to select the best alternative from those available by narrowing down the range of possibilities (a convergent process). Analytical thinking is often successful in solving closed problems, where the many possible causes have to be identified and analyzed to find the real cause.

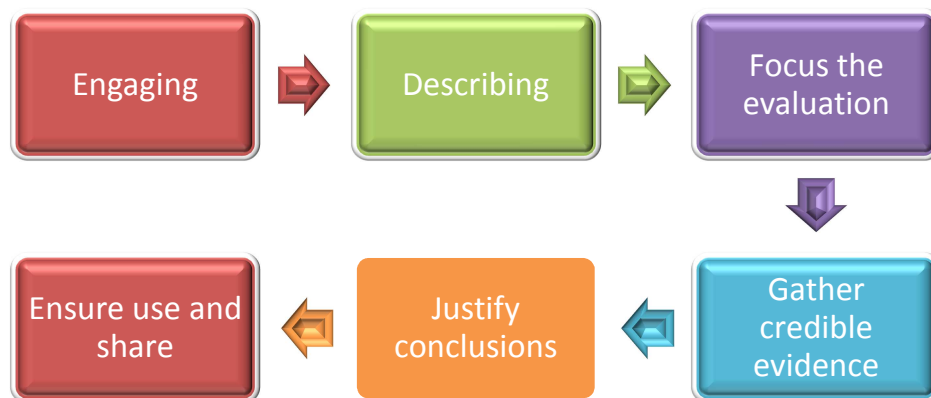
2.1.1.5 EVALUATING

Evaluating has a relative importance on the process of taking decisions with convergent and divergent thinking.

It is important that teachers learn how to evaluate a decision. It is important to be clear about which stage of the decision making process we are working at.

Are we doing our evaluation of the various options before the decision is actually made? Or have we already made the decision and are we now evaluating the results?

Next we introduce a process for evaluating decisions:



(Hershey, John C, 1988) affirms that evaluating decisions allows people to make the best decisions and avoid failing in the achievement of the goals. Good decision making depends on good information and careful analysis of data. Evaluating refers to the process of gathering data and then analyzing or ordering it in such a way that the results can be used to determine whether the ideas or attempts will work effectively in achieving the teaching and learning goals and anticipate results.

We can get information about what we are planning to do through internal evaluations so we can make decisions about our plans or programs.

2.1.2 CREATIVE METHODS

(Yoo, 2009) states that creative thinking is a creative method, which is considered as a divergent process by using the imagination to create a large range of ideas for solutions. It requires us to look beyond the obvious, creating ideas which may, at first, seem unrealistic or have no logical connection with the problem. There is a large element of creative thinking in solving open problems.

The creative thinking skills can be divided into several key elements:

- ❖ Fluency - producing many ideas
- ❖ Flexibility - producing a broad range of ideas.
- ❖ Originality - producing uncommon ideas
- ❖ Elaboration - developing ideas.

2.1.2.1 EVOLUTION

The establishment of an effective educational system is essential for the development of our country; the evolution of education has become more important than ever. When we refer to evolution, we do not only point out to our educational system but also to classroom practices.

The teaching and learning process requires innovation, and when we talk about it, we especially refer to all the new things that have been renovating the old practices.

Nowadays, we have internet and this creation has had an immense impact upon the way in which we seek to learn and teach and has indeed revolutionized our entire perspective of education.

The internet has directly led to the creation of the information age. It allows teachers and students to be connected without having to be physically present around each other.

Evolution means the use of new ideas, new strategies, new methods, techniques, learning tools and innovations that contribute to teach in ways that foster meaningful learning rather than rote learning. Evolution also means renovation of the assessing methods of the last decade. We all who are immersed in the evolution process need to change assessing with single methods by assessing with multiple methods and paper tests by computerized tests.

2.1.2.2 CHANGING DIRECTION

Talking about changing direction means that “learning is exciting, pro-active and practical” and that we need to move from rote-based learning towards integral learning through classroom activities in which students can enjoy the process of discovering and understanding.

In the past years, learning was based on exams and not on intelligence, innovative thinking or even problem solving. Today, as teachers we have the opportunity to change the direction of how information is shared to students; we must avoid wasting our time teaching structures or things that students do not understand and that can be applied in real situations.

Based on Brook's (1990) research changing direction also means to apply new methods, techniques and strategies to encourage students to think independently and operate differently to be able to compete with the outside world.

2.1.2.3 REVOLUTION

Comparing the words evolution and revolution might seem to have the same meaning; nevertheless, we want to make a little distinction when we talk about teaching. Evolution refers to the changes made in the way English was taught in the past, and revolution refers to the changes we can implement in the way English is taught and that those changes can be implemented in a short period of time.

The implementation of convergent and divergent thinking could be one way to revolutionize the English language teaching- learning process, so revolution refers to the sudden actions taken to change something.

Learning needs analysis is the process that aids teachers in identifying where students are in terms of their knowledge skills and competencies in relation where teachers want their students to be according to their teaching goals.

Learning needs analysis is an initial step in a learning cycle; it refers to data gathering and analysis exercise that take place as a classroom research and that can have the following purposes:

- to identify what skills and knowledge the learners already have
- to highlight skills/knowledge competencies that need to be developed
- to identify clearly what students wish to achieve
- to outline and define expectations and goals
- to establish needs and demands for the course you have in mind

- to determine what can realistically be achieved given the available resources
- to identify the content that best suits students' needs
- to determine which skills and what knowledge base are required from the tutor
- to establish when is the most suitable time to deliver the program and over what time frame.

Chapter Two

2.2 MEANINGFUL LEARNING

Significant learning occurs when students stimulate their prior knowledge; this process occurs as time passes and the learners learn new things. This learning is done from what is already known.

Furthermore, the significant learning, according with the teaching practices, manifests itself in different ways and in accordance with the context of the student and to the types of experiences that each student has.

When referring to meaningful learning and content, we found that the relationship between these two aspects is very broad and coherent, and although sometimes both relate to each other and the purpose sought is given, we as teachers must adapt the teaching content for a successful assimilation of the learning by the students, being the above fundamental to the teaching-learning process.

We must take into consideration that not everything is developed from the significant learning or prior knowledge that the student has, but that students transform their previous knowledge and reach the construction of a significant one,

so Salvador (1988) affirms that the concept of meaningful learning is a potentially useful and valuable tool for analysis and psycho-pedagogical reflection.

This brings us to the reflection of different attitudes, aspects and circumstances of the development of the learner and to the transformation of knowledge which has become significant, achieving in this way a good performance and obtaining a broad learning based on the previous knowledge of the student. We have the obligation, as teachers, to organize labor, time, and dynamics to provide a good working environment, so that the student can acquire a good knowledge.

This next chart is based on the theory of learning claims of Ausubel (2008):

MEANINGFUL LEARNING	VS.	ROTE LEARNING
<ul style="list-style-type: none"> • Non-arbitrary, non-verbatim, substantive incorporation of new knowledge into cognitive structure. • Deliberate effort to link new knowledge with higher order concepts in cognitive structure • Learning related to experiences with events or objects. • Affective commitment to relate new knowledge to prior learning. 		<ul style="list-style-type: none"> • Arbitrary, verbatim, non-substantive incorporation of new knowledge into cognitive structure. • No effort to integrate new knowledge with existing concepts in cognitive structure. • Learning not related to experience with events or objects. • No affective commitment to relate new knowledge to prior learning.

2.2.1 COMPONENTS OF MEANINGFUL LEARNING

In meaningful learning, students must relate new knowledge (concepts and propositions) to what they have already known; the task of a teacher is to help students link their ideas with the new material and concepts.



2.2.1.1 ACTIVE

It is when the student or teacher is in interaction with the environment, works with it, manipulates the objects within it and observes the effects of its manipulation.

2.2.1.2 CONSTRUCTIVE

In this component classroom activities are considered essential but inadequate for meaningful learning. It is important that the students reflect on their activities and the observations made on them; this task will help enormously to interpret the results from the observations in order to create meaningful learning experiences.

(Cooperstein and Weidinger, 2003) say that constructive learning requires active and direct student participation so that they can create new ideas generation for knowledge through cooperation with other individuals in order to obtain results that are beneficial to them. Students in constructive learning seek to create significant representations regardless of the quantity and quality of information.

2.2.1.3 INTENTIONAL

When students actively try to achieve a learning goal they have articulated, they think and learn more. Articulating their own learning goals and monitoring their progress are critical components for experiencing meaningful learning.

2.2.1.4 AUTHENTIC

Learning is authentic when thoughts and ideas are part of the context in which they occur in order to have meaning. Sharing ideas that are separated from the context disconnect knowledge from the reality. Learning occurs and is meaningful, it is better understood and more likely to transfer to new situations when it occurs in real life situations.

2.2.1.5 COOPERATIVE

It is based on the fact that everything we do is almost done in community. Meaningful learning requires conversations and group experiences. Pair work, group work and whole class activities are excellent teaching strategies to encourage students to learn English by seeking and sharing ideas with others.

2.2.2 MEANINGFUL LEARNING TECHNIQUES

2.2.2.1 LEARNING BY DOING

Broad (2010) holds that learning by doing is nothing new, it is as always has been learned; moreover, it is as always one keeps learning in a relatively unconscious way: "until we do, we do not really know it," and many times, we have to do it several times to really learn it. But it is still the most efficient and most satisfactory method. When a person does something, no matter how badly it is done, he or she feels some satisfaction to have made it, to have succeeded, and that improves his state of mind.

Learning by doing is:

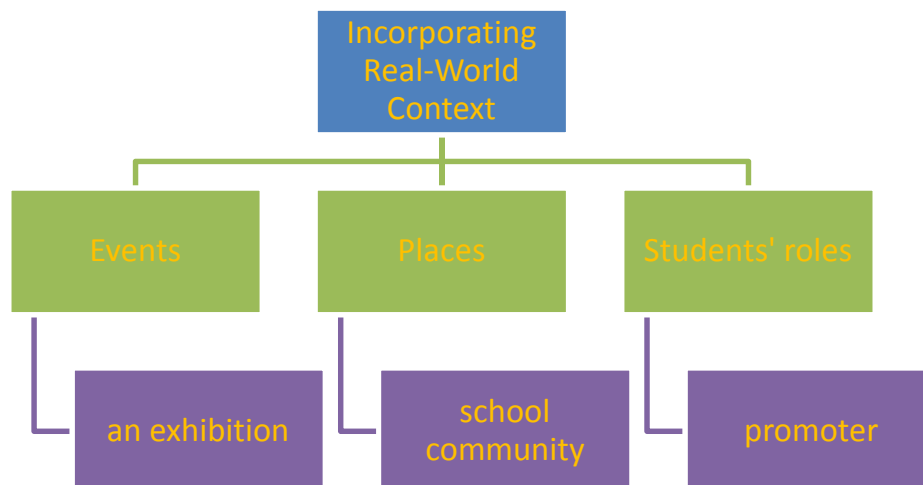
- to get your hands on: This marks the difference between the role of the student in the classroom and the passive attitude of listening to a class or watching a demonstration. Doing helps young people develop through the opportunities provided by the activities.
- to get knowledge, skills and attitudes in the English language and thus make progress in the assumed objectives. Learning by doing goes beyond the simple 'to do,' it is more than learning practical skills or manuals.
- to learn through experimentation opportunities that arise to follow the interests of the student. The intention is not to promote the obtention of knowledge, skills and attitudes in an abstract context separated from reality. When we talk about the English language, students should not learn only to translate texts or make sentences but to learn to communicate in real-life situations.

2.2.2.2 USING REAL WORLD CONTEXT

(Atwell, 2005) claims that the teaching based on active methodologies is centric teaching in a student, in his training in proper competences of knowledge of the discipline. These strategies are conceived as a constructive and non-receptive learning. Cognitive psychology has been consistently one of the most important structures of the memory in its associative structure. Knowledge is structured in networks of related concepts that are referred to as semantic networks. The new information fits into the existing network. Depending on how this is done, this connection with new information may be used or not, in order to solve problems or to recognize situations. This involves the conception of learning as a process and not just as a reception and accumulation of information. (Glaser 1991).

Years before English was taught based on structures, theories or concepts, now it is required that teachers create situations where the student has to deal with real-life situations.

Incorporating Real World Context demands that teachers prepare a possible event, place or student's role to develop their class activities as the example provided in the next graphic:



2.2.2.3 SELF-DIRECTED LEARNING (SDL)

Self-directed learning is a successful strategy, which has its roots in adult education. It is an approach that has also been tried with learners in all levels, learners as responsible owners and managers of their own learning process. SDL integrates self-management (management of the context, including the social setting, resources, and actions) with self-monitoring (the process whereby the learners monitor, evaluate and regulate their cognitive learning strategies) (Bolhuis, 1996; Garrison, 1997). Teachers otherwise scaffold learning by making learning 'visible': they model learning strategies and work with students so that they develop the ability to use them on their own (Bolhuis, 1996; Corno, 1992; Leal, 1993).

2.2.2.4 ENGAGING PRIOR KNOWLEDGE

When we learn something, that knowledge does not fit into a kind of empty compartment of our memory, but that memory is like a big spider net where knowledge is connected with others.

This provides us a great capacity to draw new conclusions, create new knowledge from a mixture of another existing one and keeping this in mind will help us to remember best what we study.

The following chart is an extract of the information found on the web page of E-pals Global community (2011) and it is about “activating prior knowledge in classroom.”



2.2.2.5 COLLABORATIVE LEARNING

Cooperative learning is a successful teaching technique to work with small teams of students, each student may have a different level of knowledge and abilities; the cooperative learning uses a variety of learning activities to improve the student's understanding of a subject. The Center for Advancing Teaching & Learning (2008) affirms that each member of a team is responsible not only for learning what is

taught but also for assisting teammates in learning, thus creating an atmosphere of achievement. Students work through the assignment until all group members successfully understand and complete it.

One of the teacher's major responsibilities is to establish situations likely to promote communication fostering collaborative relationships among students, an opportunity to work on negotiating meaning.

2.2.2.6 LESSON PLANNING

(Jensen, 1994) affirms in her book that a lesson plan is a written paper with the method of the lesson, and the specific goals and timelines associated to the delivery of lesson content. It helps teachers know what to do in a class which is prepared by them with specific activities. Lesson plans are written by teachers to help them structure the learning for themselves and for the students.

Research indicates that all students benefit from well-structured lessons and appreciate them, for this reason Milkova (2011) holds that a lesson plan is an instructor's road map of what students need to learn and how it will be done effectively during the class time. All lessons are based on the curriculum, that is, on what is intended that students learn. Sometimes the curriculum reflects intended learning outcomes that are processes, like learning to research a topic or learning long divisions. Sometimes the curriculum reflects learning outcomes relating to memorizing information, such as the multiplication tables or the conditions that make a desert.

Chapter Three

2.3 CONVERGENT AND DIVERGENT TECHNIQUES AND ACTIVITIES

2.3.1 CONVERGENT TECHNIQUES

2.3.1.1 MULTIPLE CHOICE

Multiple choice exams depend on the students' abilities to recognize facts, completion (multiple choice) items present a context in which one or more words are missing, followed by several alternative completions.

The second item with multiple choice is called "scramble sentences"; it is appropriate to test word order: the examinee has to rearrange a jumbled series of elements to form acceptable sentences.

Crisostomo (2012) holds that multiple choice exams are a form of assessment in which respondents are asked to select the right answer. As everyone knows, the examinee reads a question, and then chooses the letter that corresponds to the correct answer from a group of available options.

When we refer to convergent thinking multiple choice exams we should notice that it is a kind of activity which demands that the student brings his ideas and knowledge to solve the question.

2.3.1.2 TRUE OR FALSE

(Instructional Assessment Resource, IAR, 2011) posted that true-false questions are typically used to measure the ability to identify whether statements are correct. The questions are usually a declarative statement that the student must judge as true or false.

It is important that we take into account some considerations before we design true or false questions:

- True and false questions are appropriate to cover a lot of content in less time
- This type of questions are appropriate when there are only two possible options
- They can measure complex things when they are used for interpretation
- The scoring is easy and reliable

2.3.1.3 FILLING IN THE BLANKS

There are many ways we can define filling in the blanks activities; nevertheless, the important point is that people involved in the teaching-learning process must know how, when and why to apply this activity.

On Blackboard help, Tanya (2012) indicates that filling in the blanks is a type of question or phrase with one or more words replaced with a blank line, which gives the chance to connect two ideas or things that are very different, also the reader has the chance to add the missing word (s).

This type of question allows not only that students use the convergent and divergent thinking, but also that when teachers design these types of questions, they use their creativity and it involves considering ideas that allow students to develop their English language skills and especially to promote the meaningful learning in class. Students learn how to view problems differently and to find innovative answers to them.

2.3.1.4 MATCHING

This type of question is very similar to missing word formats; nevertheless, they have one key difference: they test knowledge in a far more applied and deep sense.

It is an important feature in creative thinking; its use allows students to use their strategies and knowledge to find a solution to questions, and for instance the student chooses the best options to match words, concepts, phrases or sentences.

According to Blackboard help (2013), matching questions allows students pair items in one column with items in another column. Instructors may include a different number of questions and answers in a matching question.

2.3.1.5 LISTING

The student is presented to the questions and he or she has the opportunity to present a list of the possible solutions

These questions are broader than memory questions because they require students to answer the questions by putting facts together and constructing an answer.

The students must know certain facts, be able to associate or relate these facts and give an explanation, by using their words. The students are required to explain, state relationships, associate and relate, and compare or contrast different language aspects.

2.3.1.6 IDENTIFYING

When we talk about identifying, we refer to techniques used for the identification of the actual or potential cause of a problem and its possible solution.

When a student finds questions of identification, he / she is developing his /her critical thinking and creativity in order to analyze the facts, information and characteristics in order to generate a large number of ideas.

The stimulation of creativity plays a very important role in the activities of identification allowing different perspectives or approaches and critical thinking can help to improve to solve a problem.

2.3.1.7 COMPARING AND CONTRASTING

Brinkley (2009) states that when students compare and contrast ideas, they are finding similarities and differences on what they are reading. In this type of questions, it is important that students understand the concept of comparing and contrasting by making analogies to either synonymous or antonyms; how things are alike and how they are different from establishing similarities and differences.

When students compare and contrast, they are using convergent thinking, because they are using their previous knowledge to establish in which aspects the compared things are alike, in what they are different, and what similarities and differences are important. It could be called a deep analysis and understanding.

2.3.1.8 RANKING

(Northern Island Curriculum, 2009) says that this activity allows pupils to prioritize ideas and information and discuss justifications for their choices. Pupils

arrange them in order of importance/priority. They might do this in a straight line or build up tiers.

Pupils might then compare each other's ranking as a starting point for class discussion of the issue.

When students work with ranking activities, they are using active learning methodologies and it is hoped that pupils will not only come to a deeper understanding of the issues involved, but also that their motivation and enthusiasm will be heightened.

2.3.2 DIVERGENT TECHNIQUES

2.3.2.1 OPEN ENDED QUESTIONS

These questions are thought-provoking and they allow more than one acceptable answer. The answers to these questions are not necessarily predictable. Divergent questions might create new problem situations and require students to synthesize ideas and construct a meaningful solution.

2.3.2.2 BRAINSTORMING

Carlson and Manktelow (2010) hold that brainstorming is a creative technique created to generate a large number of ideas for the solution to a problem. It is appropriate for individuals who are trying to come up with many ideas around a specific area of interest. Using rules which remove inhibitions, students are able to think more freely and move into new areas of thought and in this way creating several new ideas and solutions.

Students in a classroom shout out ideas as they occur to them and then build on the ideas raised by others.

Brainstorming is a technique that contributes to encourage students with their natural creativity and personal style. Brainstorming is flexible enough to be able to suit everyone and stimulate idea generation; it can be used to work better when writing or speaking.

2.3.2.3 MIND MAPS

It is a graphical way to represent ideas and concepts. It is a visual thinking tool that contributes to structure information. Mind maps help students analyze, comprehend, synthesize, recall and generate new ideas in a better way.

Buzan (2003) holds that a mind map, as opposed to traditional note taking or linear text information, is structured in a way that is much more closely to how our brain actually works. This technique engages students' brain in a much richer way helping with all cognitive functions.

Since it is a simple technique to draw information in form of diagrams, instead of writing sentences, the diagram must always take the same basic format of a tree with a single starting point in the middle that branches out, and must be divided again and again, the tree must be made up of words or short sentences connected by lines.

Mind maps make easier to apply the divergent thinking. Our brain is constantly creating pictures, graphics, numbers, logic, rhythm, and has a special awareness to build up unique pictures of information, the ideas are linked together in a way that makes it easy to understand and remember.

When we write about learning styles, we refer ourselves to the ability that each individual has to acquire or process information in a specific learning situation.

2.3.2.4 CREATING QUESTIONS

(Thalheimer, 2003) says that when the questions are well-designed, they are particularly effective because they provide learners with practice with recalling information from memory. They give learners feedback about their misconceptions; they focus learners' attention on the most important learning material, and they repeat core concepts, giving learners a second chance to learn, relearn, or reinforce what they previously learned or tried to learn.

As researchers say, questions have beneficial effects whether they are presented before or after their associated learning material. Pre-questions focus learners' attention toward the queried concepts during learning, while post-questions provide retrieval practice and feedback on information that has already been learned. Both pre and post-questions provide the substantial benefits of repetition.

Questions are considered the most effective when they are relevant to the learner. Irrelevant questions can actually hurt learning and performance by creating tangential memory structures and distracting learners from important concepts. Post-questions produce their most important results when they prompt learners to retrieve information from memory in the same way they will retrieve that information later in their performance situations (on the job, on tests, during learning and practice). Questions that are directed to higher-order information—in contrast to minutiae and trivia—are more powerful to produce learning. Questions have specific, not general, effects on the information that is queried, therefore a question should be created for

each important concept. Questions can motivate learners to engage into learning activities despite their tendency to overestimate their ability to remember.

2.3.2.5 CREATING DIALOGS

Creating dialogs provides students with competences to create real conversation situations where students can use all their imagination to create the different characters and their roles, or students have to use creativity to play role situations.

Students have retrieval practice and corrective feedback through dialogs. And they are appropriate and valuable to meet the learning objectives of the learning, give learners retrieval practice, and focus their attention on key concepts.

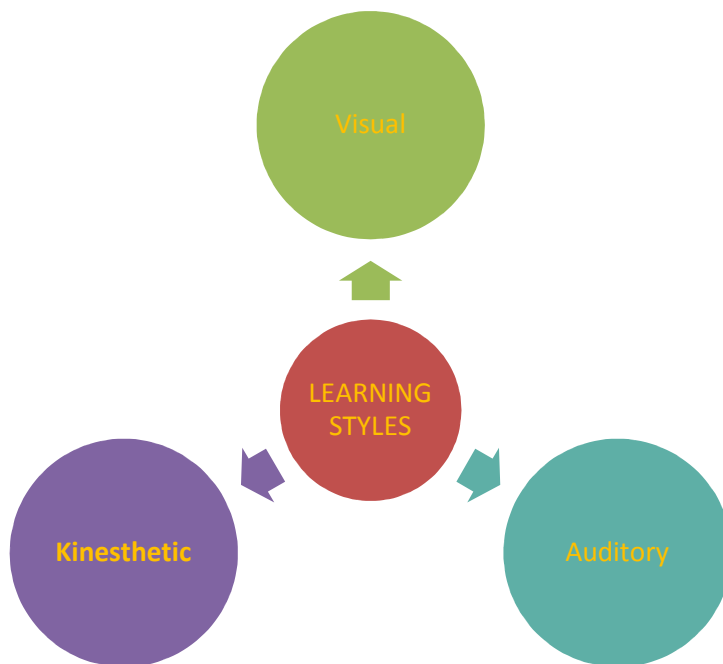
2.3.2.6 FREE WRITING

Wikipedia, the free encyclopedia (2012) states that it is a technique in which a person writes continuously for a period of time without regard to spelling, grammar, or topic. It has the purpose to collect ideas and thoughts on a topic. It is the easiest way to get words on a paper and the best practice to write what the student knows. It is necessary that the student writes without stopping for a period of time which is determined by the teacher in order to do a free writing exercise.

Chapter Four

2.4 LEARNER AS THE MAIN GOAL

2.4.1 LEARNING STYLES



(The university of Wester Ontario, 2009) states that it is important to recognize that everyone receives information through their senses, nevertheless each person employs a different combination of their senses to learn things: visual, auditory, kinesics, smell, sense of touch and taste.

2.4.1.1 VISUAL

(Sprenger, M., 2003) holds that visual learners react well to pictures, schemes, drawings, and they have a few problems with reading and writing. They often have a

good orthography because they can memorize through images. These learners are good observers and organized.

2.4.1.2 AUDITORY

(Sprenger, M., 2003) says that auditory learners learn better using their ears, so they enjoy listening to people and music while they do their learning activities. Repetition is used to help them in learning. They also like to read loud and lead discussions; they sometimes talk while they are writing.

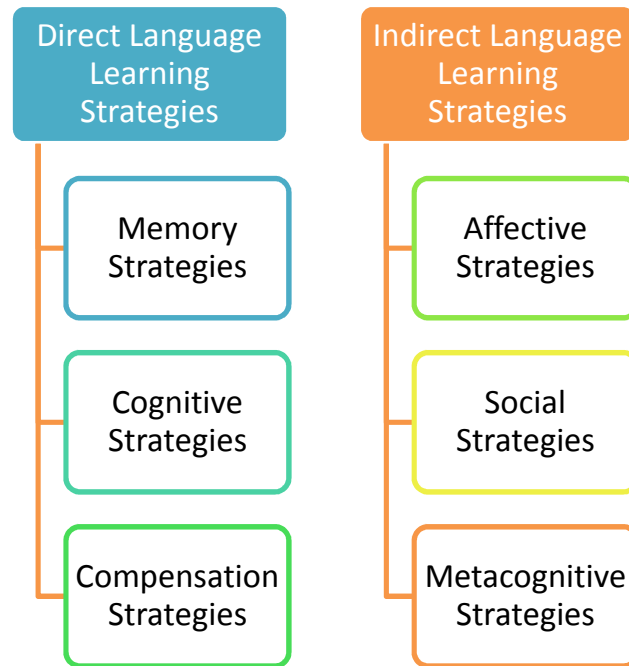
2.4.1.3 KINESTHETIC

Kinesthetic learners (tactile or of movement) are different to the rest of learners. They can express themselves in two ways: externally and internally. (Sprenger, M., 2003) says that the learners with this externally developed sense need to touch and move to receive information; in the meantime internal learners need to experiment internal feelings and emotions.

2.4.1.4 LEARNING STRATEGIES

Researchers have written many books and articles about learning strategies. There are more than sixty techniques that they have discovered, in order to summarize them and make it simple to present.

Our summary is based on the division made by an Oxford researcher, who divided the learning strategies into two groups: Direct Language Learning Strategies and Indirect Language Learning Strategies as it is showed in following graphic:



2.4.1.4.1 DIRECT LANGUAGE LEARNING STRATEGIES

(Samida, 2006) posts that the direct strategies become very important and beneficial to students in the learning process because they aid in storing and recovering information. They help learners produce the language even when the student has gaps in her or his own knowledge.

Memory Strategies

They are based on simple principles like laying things out in order, making association and reviewing. These principles are employed when a learner faces challenges of vocabulary learning. The importance of this strategy is that learner associates words and phrases with visual images that can be stored and reviewed for communication. It is interesting that some learners make use of visual images, but others find easy to connect words and phrases with sounds, motion, or touch.

Cognitive Strategies

Learners with cognitive strategies manipulate or transform by repeating, analyzing or summarizing. The learners can follow these steps: practice, receiving and sending messages, analyzing or reasoning and creating structures for input and output.

Compensation Strategies

Here the learner uses these strategies for comprehension of the target language. These strategies assist learners in overcoming their weaknesses in grammar and vocabulary. When learners do not know new words and expressions, they use these strategies to guess. Besides, when their grammatical knowledge is incomplete or a learner does not know the meaning of a verb, she / he can use a different form to convey the message.

2.4.1.4.2 INDIRECT LANGUAGE LEARNING STRATEGIES

Indirect Languages Strategies always work together with the Direct Strategies. Their role is to ease learners to coordinate their learning and to assist them in planning the language learning in an efficient way. When learners get confused with new grammar or vocabulary rules, these strategies become vital for successful language learning.

Affective Strategies

A learner is influenced by his affective factors like emotion, attitude, motivation and values. This helps enormously lower his anxiety, encourage himself and level his emotional temperature. Good language learners are conscious that negative feelings

decrease learning; that is why learners need to learn how to control their attitude and emotions about learning.

Teachers are also responsible for collaborating with students and generate positive feelings in class by giving students more responsibility, increasing the amount of natural communication, and teaching effective strategies. It is important that teachers aid students to overcome anxiety problems because it can be both helpful and harmful.

Social Strategies

Samida (2012) holds that communication occurs between people and social strategies, and this is very important when a person is learning a language. There are three ways of promoting the social strategies: by asking questions, cooperating with others, and empathizing with others.

Empathy is very important in communication; empathy helps understand people's points of view. Learners develop cultural understanding through social strategies and become aware of thoughts and feelings of others. When a learner cooperates with others, he / she is developing her / his language skills and she / he is learning with the help of other people.

Metacognitive strategies

Metacognitive strategies allow students to examine their brains' processing; they can become more strategic thinkers when they understand the way they are processing information. Questioning, visualizing, and synthesizing information are ways that students can examine their thinking process.

Teachers can use metacognitive strategies in class for several purposes such as: deeper understanding in a learning situation, higher level thinking, plan and organize, monitor and identify a problem, evaluate and manage their own learning.

2.4.2 MULTIPLE INTELLIGENCES

The following classification is based on the theory of Multiple Intelligences by Howard Gardner (1989) in his book Frames of mind.

2.4.2.1 SPATIAL

This type of learner deals with spatial judgment and with the ability to visualize with the mind's eye. Specifically it refers to the comprehension of the spatial relations, learners use forms, colors, aspects and the capacity of thinking on images, imagine and visualize. Learners can understand the three dimensions and get a direction sense, the capacity to understand a map.

2.4.2.2 LINGUISTIC

When a student has this intelligence, it means she / he has to deal with spoken or written words. People with high verbal linguistics intelligence display a facility with words and languages. They are normally excellent at reading, writing, telling stories and memorizing words along with dates. This type of learners tends to learn best by reading, taking notes, listening to lectures, discussions and debate. They learn very easily foreign languages since they have high verbal memory and recall, and an ability to understand and manipulate.

2.4.2.3 LOGICAL MATHEMATICAL

Learners are characterized for dealing with logic, abstractions, reasoning, and numbers. While it is often assumed that those with intelligence naturally excel in mathematics, chess, computer programming and other logical or numerical activities, a more practical definition places less emphasis on traditional mathematical ability and more on reasoning capabilities, abstract patterns of recognition, scientific thinking and investigation, and the capability to perform complex calculations.

2.4.2.4 BODILY-KINESTHETIC

The principal elements of the bodily-kinesthetic intelligence are: control of one's bodily motions and capacity to handle objects skillfully. It refers to the movement and the body use for the auto-expression in a coordinated way. It includes the information processing through the body sensation and the possession of good physical skills.

2.4.2.5 MUSICAL

Students are sensitive to sounds, rhythms, tones, and music. People with a high musical intelligence normally have a good pitch and may even have absolute pitch and are able to sing, play musical instruments, and compose music. Since there is a strong auditory component to this intelligence, those who are strongest in it may learn best via lecture. Students with this intelligence will learn better when they use songs or rhythms.

2.4.2.6 INTERPERSONAL

This area has to do with interaction with others. Students with this intelligence tend to be extrovert, characterized by their sensitivity to others' moods, feelings,

temperaments and motivations, and their ability to cooperate in order to work as a part of a group. They communicate effectively and empathize easily with others, and may be leaders or followers. They typically learn best by working with others and often enjoy discussion and debate.

2.4.2.7 INTRAPERSONAL

Students with this intelligence are intuitive and typically introverted. They are skillful at showing their own feelings and motivations. They have a deep understanding of themselves, their strengths and weaknesses; they can predict their own reactions or emotions.

2.4.2.8 NATURALISTIC

This intelligence has to do with the nature, nurturing and relating information to one's natural surroundings. This type of learner has empathy with our natural environment, she / he has the skill to separate, categorize, and analyze.

2.4.2.9 EXISTENTIAL

The ability to contemplate phenomena beyond sensory data, such as infinite and infinitesimal.

2.4.3 MOTIVATION AND SELF-ESTEEM

(Tavani and Losh, 2003) affirms that one way of developing self-esteem, increase confidence and rapid achievement is by cooperating with others. Cooperation with others eliminates competition and instead brings up a group spirit.

Sometimes a competition brings up a strong wish to perform better than others. It becomes very important to help learners to change their attitudes from competition and confrontation to cooperation.

Motivation and self-confidence contribute enormously to students' achievement in class and increase their learning expectations.

WORKING HYPOTHESIS

Convergent and divergent thinking will promote the meaningful learning in the English classroom on students of the third year of Bachelor at the "Francisco Campos Coello" high school in Guayaquil during the first quimestre of the school year 2013-2014.

NULL HYPOTHESIS

Convergent and divergent thinking will not promote the meaningful learning in the English classroom on students of the third year of Bachelor at the "Francisco Campos Coello" high school in Guayaquil during the first quimestre of the school year 2013-2014.

ALTERNATIVE HYPOTHESIS

Convergent and divergent thinking will not influence the students' performance in the English classroom on students of the third year of Bachelor at the "Francisco Campos Coello" high school in Guayaquil during the first quimestre of the school year 2013-2014.

PART THREE

3 METHODOLOGICAL DESIGN

3.1 RESEARCH TYPE AND DESIGN

The type of research and design is applied, descriptive, and of field. Also it is quantitative, correlational and transversal. This is also a **quasi-experimental** research for the following reasons:

1. It has two variables: an independent (convergent and divergent thinking) and a dependent one (meaningful learning).
2. The students for the experimental and control groups are assigned by applying the formula to establish samples. This means that the students for the control and experimental group are selected carefully in order to get relevant information that contributes to the validation of this investigation.
3. It follows a set of procedures that the scientific research demands to assure its validity in the scientific community.
4. The researcher does not have the total control on the variables

This investigation also has characteristics of a **descriptive study** for two reasons:

1. It seeks to analyze and describe events and situations that are happening around the learning of the English language with convergent and divergent thinking.
2. This type of study also allows analyzing the variables independently to describe better the phenomenon.

This research is **applied** because it is focused on providing information that can help the researcher to solve the existing problems related to the lack of convergent

and divergent thinking class activities. Based on the obtained information, set the route to take in the solution of problems and design a proposal that allows the incorporation of new techniques for promoting the creative thinking.

It is **of field** because to solve the problem in the high school, the researcher went to the school to see how the practices of teaching were being developed, see how teachers interact with their students, see techniques, methods, activities used, the teaching materials and determine whether it is being promoted or not the meaningful learning in classes.

It is **correlational** because this type of descriptive study aims to determine the degree of relationship or non-causal association between two or more variables. They are characterized because the variables are measured and then, using correlational hypothesis testing and the application of statistical techniques, estimated the correlation. Although correlational research does not establish direct causal relationships, it can provide clues about the possible causes of the lack of convergent, divergent thinking activities in class.

It is **transversal** because it tried to determine and meet the condition of students with regard to what has been learned in classes: the domain of their language skills. The effectiveness of convergent and divergent thinking activities in classes was determined and it was seen if they contributed to promote the meaningful learning, which was proven by tests.

3.2 RESEARCH METHODS

The first method is the **quasi-experimental**, involving the analysis about the practice of manipulating quantitative information gotten from the pre and post-test applied before and after the experiment; this information is related to the independent variables to generate statistically analyzable data.

A second method included in this research is known as **quantitative** because its aim is to determine the relationship between the independent variable (convergent and divergent thinking) and the dependent variable (meaningful learning).

A third method is the **descriptive** method because the subject sample of the investigation was tested before and after the experiment by means of a pre- and a post-test. This method establishes only associations between variables. This method is very important during the initial steps of the investigation to design our project profile.

The descriptive method is appropriate to obtain information about the present existing condition. It is based on describing not on judging or interpreting. This method aimed to formulate and then to verify the formulated hypotheses (convergent and divergent thinking in the meaningful learning) that refers to the present situation in order to explain it. This method allowed a flexible approach, thus when important new issues and questions arise during the study, further investigation may be conducted.

The descriptive method is mainly focused on describing the nature or condition and the degree in detail of the present situation. This method describes the nature of a situation, as it exists at the time of the study and explores the cause/s of the

particular phenomenon (convergent and divergent thinking in the promotion of meaningful learning). The aim of the descriptive method is to obtain an accurate data of the people, events or situations that are investigated.

3.3 POPULATION AND SAMPLE

3.3.1 POPULATION

To define the population for this study, it is important to consider that students from the third year of bachelor are the main participants of this investigation. There are eight third years of bachelor (146 men and 227 women = 373 students): they are the population of this investigation.

The population of the students of the third year of bachelor is not small, thus it needs a specific treatment to select the sample from the population. Therefore it became important to select the proper method of sampling, the process by which representative individuals are randomly selected to provide insights into the entire population under study. A formula is needed to be applied.

The students from the third year of bachelor assure the validity of the investigation because the subjects of the investigations have the same characteristics.

3.3.2 SAMPLE

The following formula was used to determine the sample from the population

$$n = \frac{N * Z_a^2 * p * d}{d^{2(N-1)} + z_a^2 * p * d}$$

N= Total of the population

Z_a= Confidence

p= probability

d= Margin

n= sample

$$n = \frac{373 * 1.96^2 * 0.05 * 0.95}{0.03^2 (373 - 1) + 1.96^2 * 0.05 * 0.95} = 190$$

N= 373

$$Z_a^2 = 95\%$$

d=5%

p= 5%

n=190

This research is not going to be constituted by a simple random sampling to define which students are going to constitute the control group and the experimental group. They are going to be assigned to each group following certain specifications according to the research requirements and the demands of the school authorities.

The experimental group will receive a special treatment with the convergent and divergent thinking classes, while the control group will continue with the normal classes.

3.4 FIELDING

The field is made up by students, teachers and authorities at Francisco Coello high school, which is located in the city of Guayaquil; the investigation will take place during the first quimestre of the school year 2013-2014.

3.5 INSTRUMENTS FOR DATA COLLECTION

The effective data gathering is essential for the analysis and the interpretations of results and the hypothesis testing; the data collected must have validity and reliability. It is important to guarantee that all the data collected and entered in a standard format for the analysis contributes to accomplish the objectives set in the project.

The following paragraph describes the techniques which are going to be used to gather the information:

There is often the need to use **questionnaires** for the data collection and the qualitative research. They need to be well designed and they are going to be applied to the teachers about the convergent and divergent activities experimented in classroom. The questionnaires are going to be checked and tested before they are applied to the participants in the investigation.

According to the resource found in the Internet, it says that questionnaires are excellent tools to gather information about people's opinions, often asking respondents to indicate how strongly they agree or disagree with a given statement, but sometimes merely posing a question and giving respondents space in which to formulate their own replies.

One of the obvious advantages of questionnaires is that they provide data amenable to quantification, either through the simple counting of boxes or through the content analysis of written responses.

According to (Scribs, 2013) a simple way to obtain research data could be through questionnaires; a poorly designed questionnaire can lead to wasted time and effort, useless data and frustrated respondents.

The **Observation** is going to be used in this investigation. It consists on observing the students before and after the special treatment in the experimental group: “how do they respond to the convergent and divergent activities when they are receiving the special treatment in the experiment”.

The **pre- and post- tests** is going to be included. They are going to be used before and after the experimental plan when the convergent and divergent thinking activities take place.

The pre-test is going to be applied to both the control and the experimental groups at the beginning of the experiment. This test seeks to collect information about the strengths and weaknesses of the students’ knowledge about the topics, structure, and skills developed in class.

The post-test is going to be applied to both the control and the experimental groups at the end of the research. This test seeks to collect information about the students’ improvements gained with the experiment in the case of the experimental group which receive the special treatment with the convergent and divergent thinking activities.

The **checklists** are instruments that will be used with the classroom observation and that will be used systematically to observe students’ behavior in response to the convergent and divergent thinking activities and their effectiveness in the promotion of the meaningful learning in classroom.

3.6 PROCESSING AND ANALYSIS.

When analyzing data, whether from questionnaires, interviews, focus groups, or any other source, it is always important to start reviewing the research objectives. This action helps organize the data and focus the analysis. In the case of this investigation, the information gotten from questionnaires, observations, and tests will be processed and analyzed by following the next steps:

3.6.1 CATEGORIZING

The table T will be used to clarify concepts and ideas to facilitate the categorization of the information, compare and contrast visually the information and also examine the facets of the same topic.

3.6.2 CODING

The coding will be done in two levels: first the obtained information will be coded into categories, then comparison will be established and grouped together to establish links.

3.6.3 EXCEL IN THE TABULATION

Before the information is processed on a computer, the tabulation will be made by using Excel to save time.

3.6.4 THE DATA PROCESSING

This part consists on processing all the dispersed, disorderly and individual data. It implies the use of statistical techniques to facilitate the management of the obtained information. The results obtained from the analysis and interpretation will be presented in tables, graphs, etc.

PART FOUR

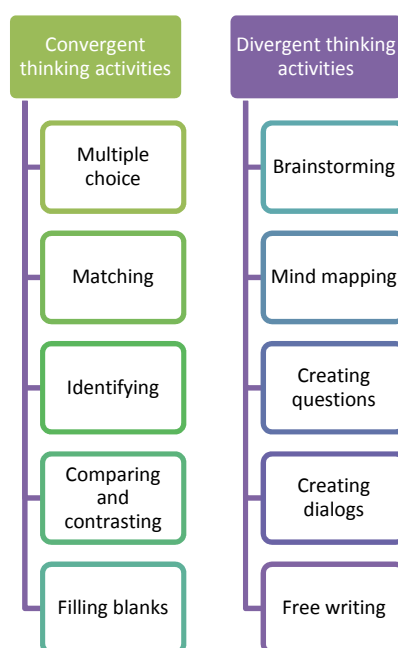
4 TESTING THE HYPOTHESIS

This investigation is characterized for having two groups: the control group and the experimental one. The experimental group received a special treatment and had the opportunity to use the convergent and divergent thinking in order to find the correct answers to the exercises or solve problems.

In other words, the activities were prepared for students to learn, solve problems, think critically and creatively, make decisions, generate new ideas, analyze and plan.

The experimental and control groups were measured by pre and post-tests; they were based on the topics, vocabulary, grammatical structures taught in class.

The teaching techniques were based on communicative methods considering especially those related to convergent and divergent thinking classroom activities, which are found in the next chart:

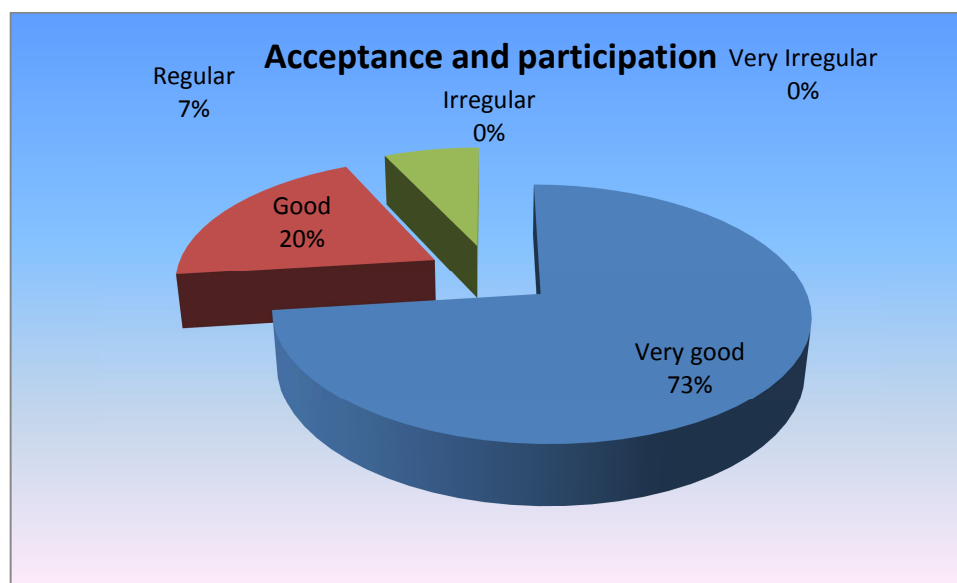


4.1 GRAPHICAL EXPOSITION OF RESULTS

4.1.1 STUDENTS' RESULTS GOTTEN FROM THE CHECKLIST

4.1.1.1 CONVERGENT THINKING ACTIVITIES

It is important to represent with graphics how students respond to the different activities in which they participated. It was necessary to consider some indicators like: performance, motivation, acceptance, achievement, participation, collaboration, and involvement. The order of the convergent thinking activities introduced in the following pie-charts is based on the criteria that the better grades are placed in the first place, then the other ones.



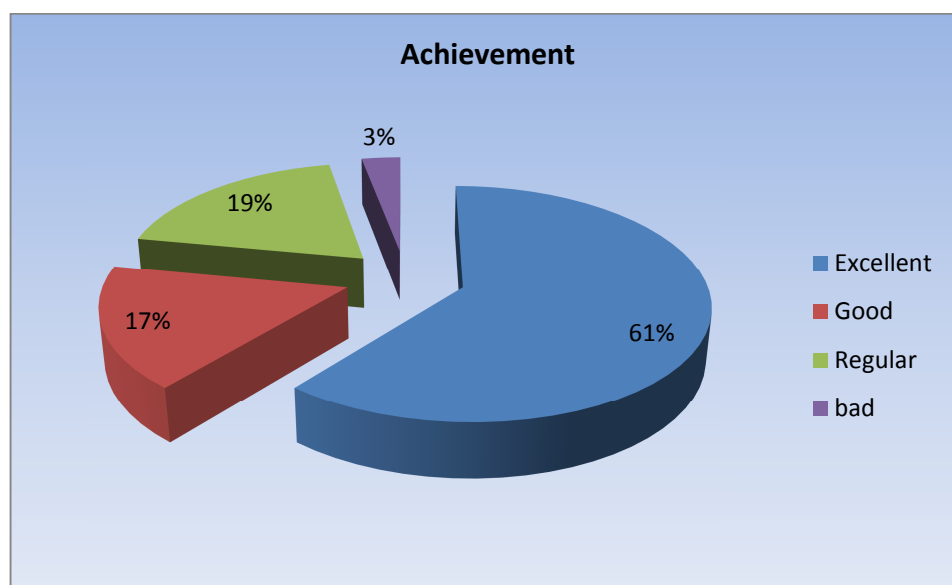
2 Multiple choice

As it is represented in the graphic, it could be said that multiple choice activities had an excellent acceptance and the participation was also excellent. A 73% of students are in the very good option and 20% are in the good option which means there is 93% in favor of the multiple choice activities.



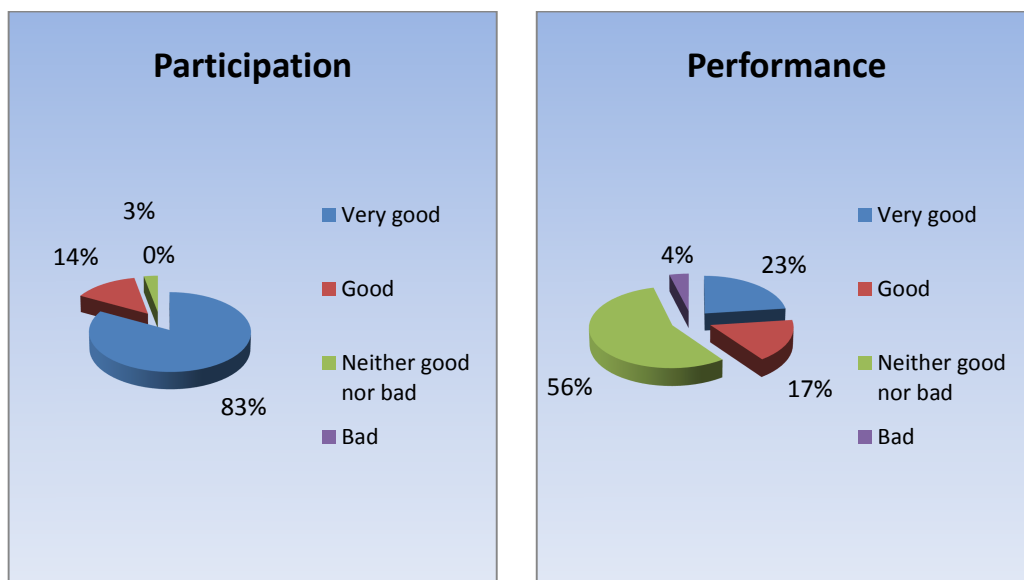
3 Matching

It was the same in the matching activity like in the multiple choice activities: the students responded excellent and their motivation is very good as it is appreciated in the graphic: a 84% are in the option very good, a 13% are in the option good, a 3% are in the option neither good nor bad and 0% in the bad.



4 Identifying

Identifying is an excellent technique for students to use convergent thinking where they had the opportunity to locate and focus on the problems and look for a single best solution. As it is appreciated in the graphic a 61% did excellent, a 17% did well, a 19% did regular, and a 3% did badly.

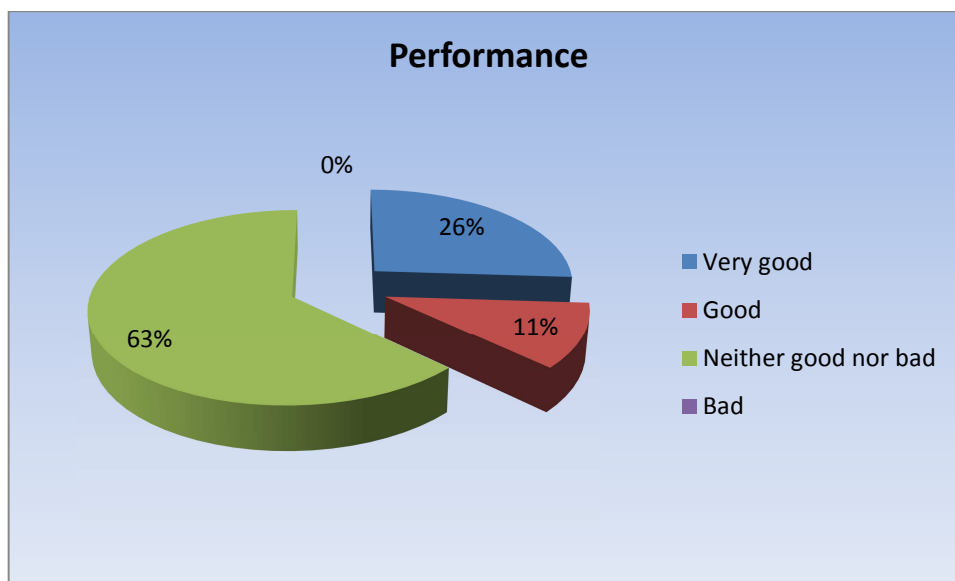


5 Comparing and contrasting

There are two graphics for the comparing and contrast activity. The first one is about participation and the second one is about performance. As it is appreciated the participation of students in the comparing and contrasting activities on the first graphic was extraordinary. This is an indicator that the teacher is accomplishing their instructional goals. Students' maintained their attention and focus on the activities. It was evident they were motivated to make the connection between the content of the activities and their previous knowledge.

However, the performance of the second graphic was not excellent. Students had some problems to assign the correct answers or solutions to the situations in the

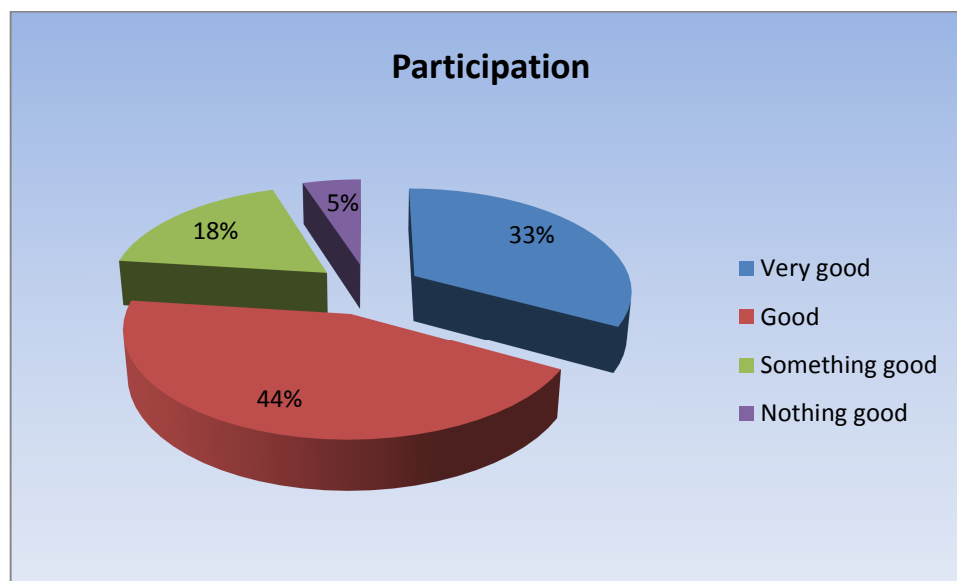
activities. A 56% of students are in the option neither good nor bad, 4% in the option bad, 17% in the option good and 23% in the option very good.



6 Filling in the blanks

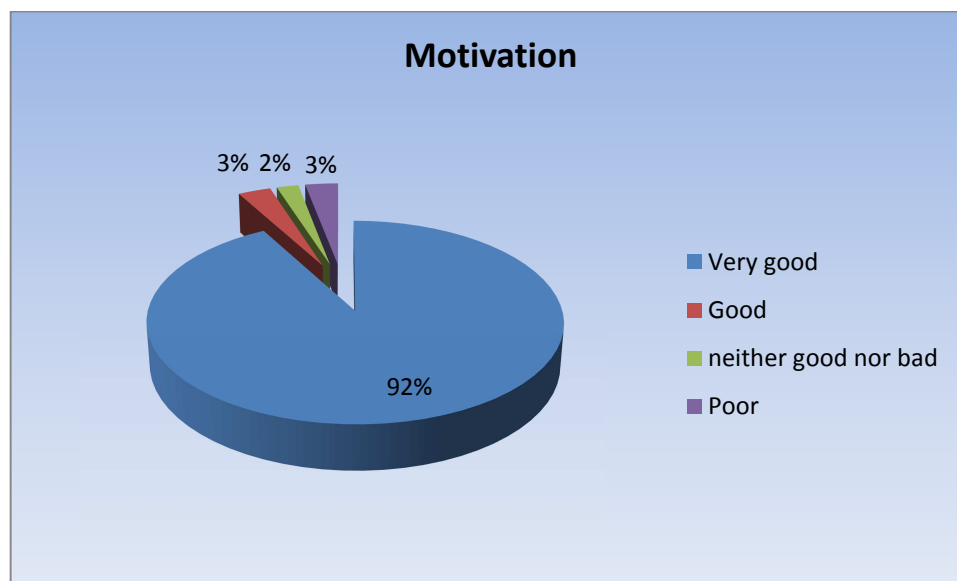
Talking about performance “filling in the blanks” activities was a test that students did not approve, as it is showed in the graphic a 26% of students did very good in the activities, an 11% did good, a 63% neither good nor bad, and there were no students with the bad option. During the class activities students looked something confused while they were analysing the factors but most of them could not make the right decision to fill the blanks.

4.1.1.2 DIVERGENT THINKING ACTIVITIES



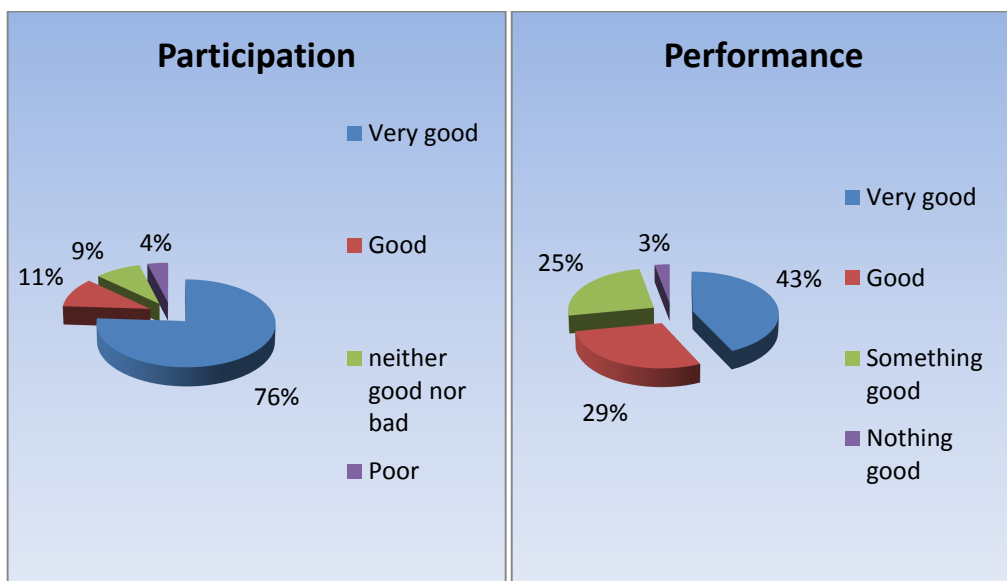
7 Brainstorming

When a word was written on the board, it was very interesting to see a considerable number of students doing their effort to bring their ideas to the class about the word on the board. Although not all of their ideas were successful, it was the effort that counted; they enjoyed the activity and learned something new which had not been previously practiced with their teacher. The percentage of the students' participation was as it is presented in the graphic above.



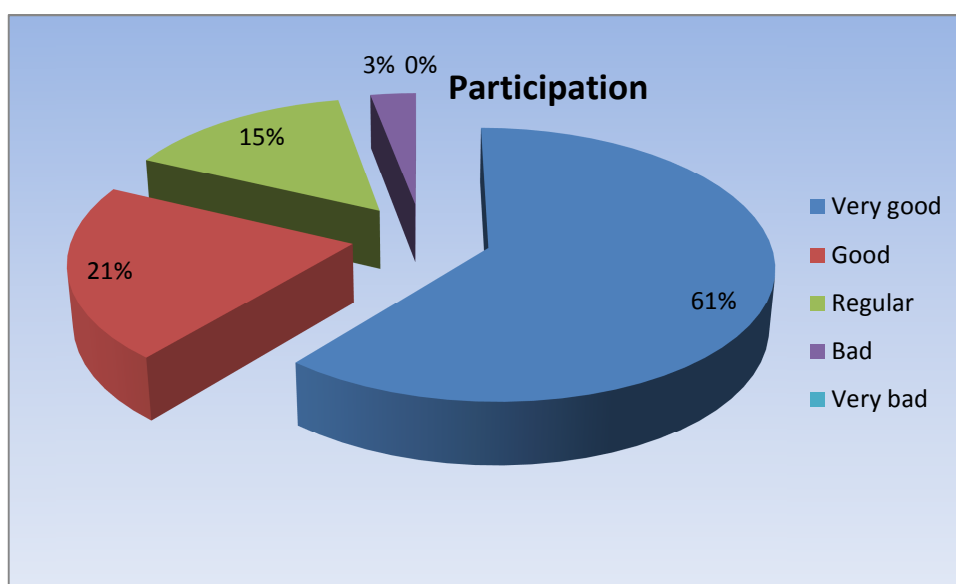
8 Mind mapping

Although it was the first time they had worked with mind-mapping, their motivation and performance were good, and they were able to use the convergent and divergent thinking to explore their prior knowledge about a new theme, as well as for the integration of the new information they learned. As it is appreciated in the graphic a 92% of students are in the option very good, 3% in good, 2% neither good, nor bad and 3% in the option poor.



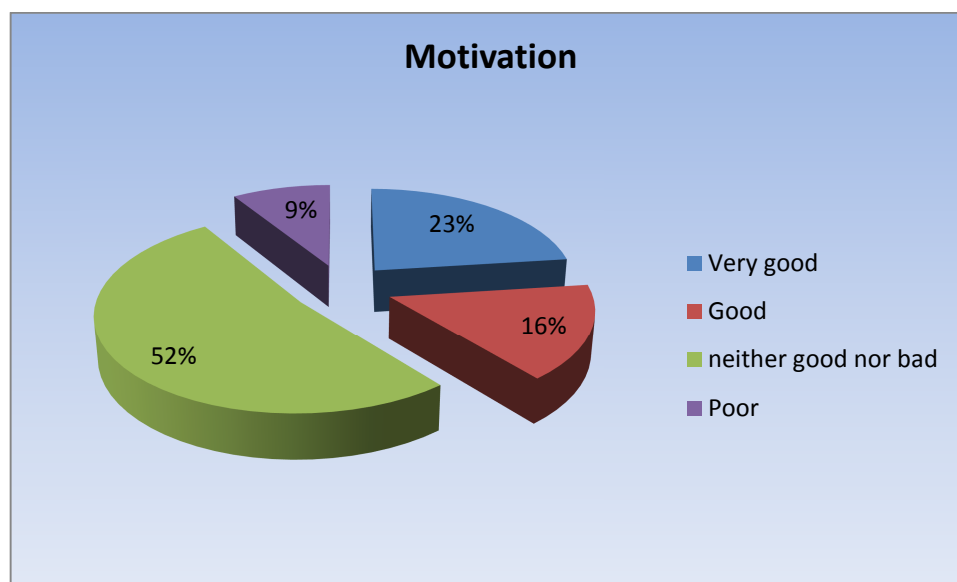
9 Creating questions

In order to contrast information, participation and performance were analyzed, as it is appreciated in the first chart, most of students participated actively in the activity, although some questions were not accurate enough as it is shown in the second graphic, they had the intention to do the best and only there was a 3% that had serious problems in making and asking questions.



10 Creating dialogs

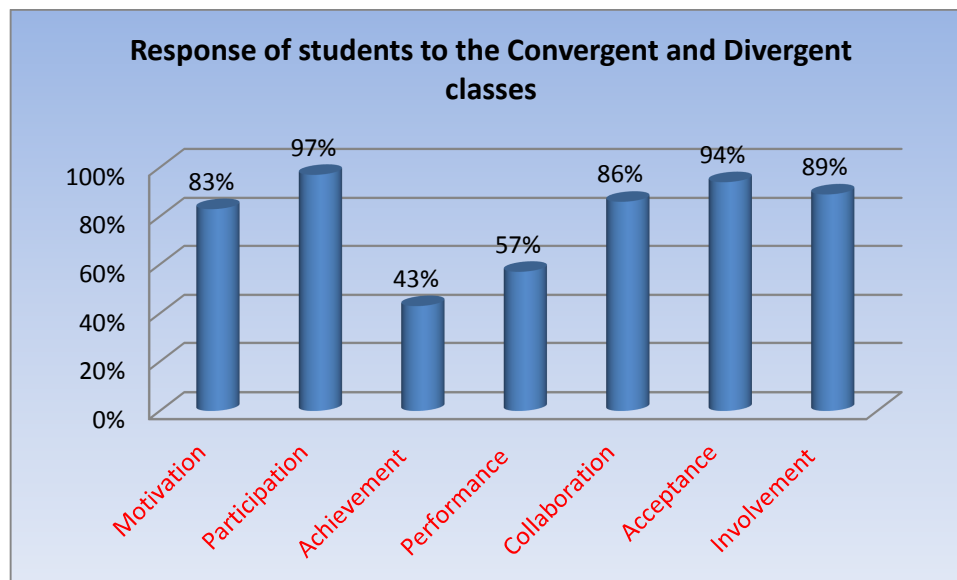
As it is appreciated in the graphic above, 61% of the students participated in the activity although they had some problems creating accurate dialogs. 21% of the students did good; 15 % did regular, and only a 3% did very bad



11 Free writing

Students had the opportunity to write freely, during 10 minutes each time, it was a rewarding experience to express their ideas in various subjects. Nevertheless, the graphic above shows us that motivation was not so good for 52% of pupils; 23% of students showed interest for the activity; 16% of the population had good motivation in this specific activity, and only the 9% of them had a poor motivation.

Next, we are going to introduce a chart which shows the different checklist indicators with their percentages. It is necessary to state that this graphic is the summary of all the results gotten in the checklist instrument.

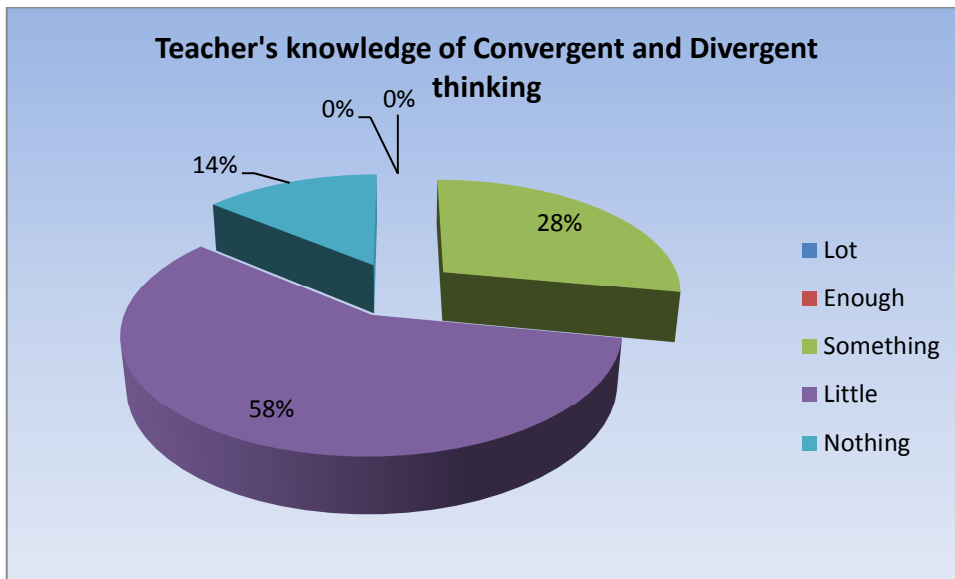


In this graphic, we can see the students' response to the special treatment with activities of convergent and divergent thinking. We see with some indicators that the response was excellent. In other cases, these activities presented some difficulties, but this cannot be attributed to the failure to the planned activities. There are other factors that might have influenced like the same motivation, aptitude for the language, and it should especially be considered that this was the first time that students were exposed to certain classroom activities such as: mind maps, brainstorming, etc.

4.1.2 TEACHERS' RESULTS GOTTEN IN THE QUESTIONNAIRE

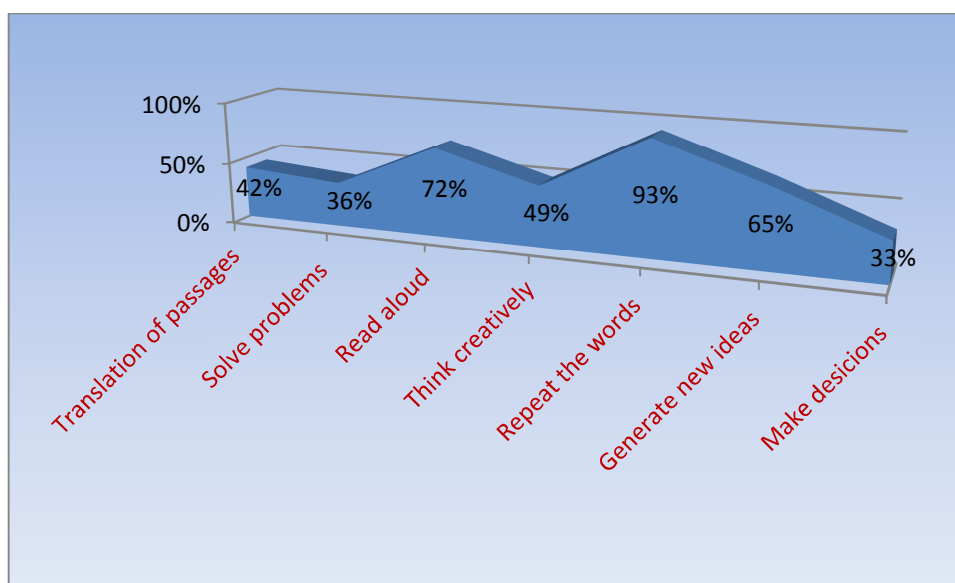
1. How much do you know about Convergent and Divergent thinking?

- a. lot b. enough c. something d. little e. nothing



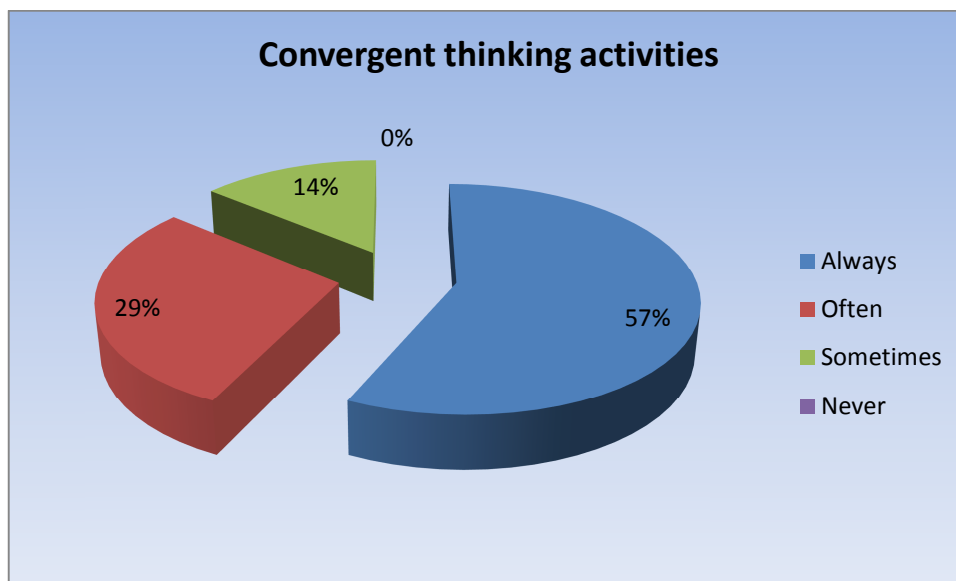
Convergent and divergent thinking sounds new to many teachers around our country and teachers of the English area of this school were not the exception. Most of them had heard about it, but had no idea how to apply it to the teaching and learning process; that is why, this graphic shows us that 58% of them knew almost nothing, a 28% something and 14% were totally unaware of it.

2. With which of the following class activities (techniques) have you worked with your students?



This question was raised with the purpose of determining whether teachers were including in their teaching practice activities that corresponded to the convergent and divergent thinking. Sadly as the graphic shows, we can realize that the activities with higher percentages are those that correspond to traditional methods, like repeat the words with a 93%, and read aloud 72%, which means that little emphasis is placed on those activities that actually promote meaningful learning such as: problem solving (36%), creative thinking (49%), generation of new ideas (65%), etc.

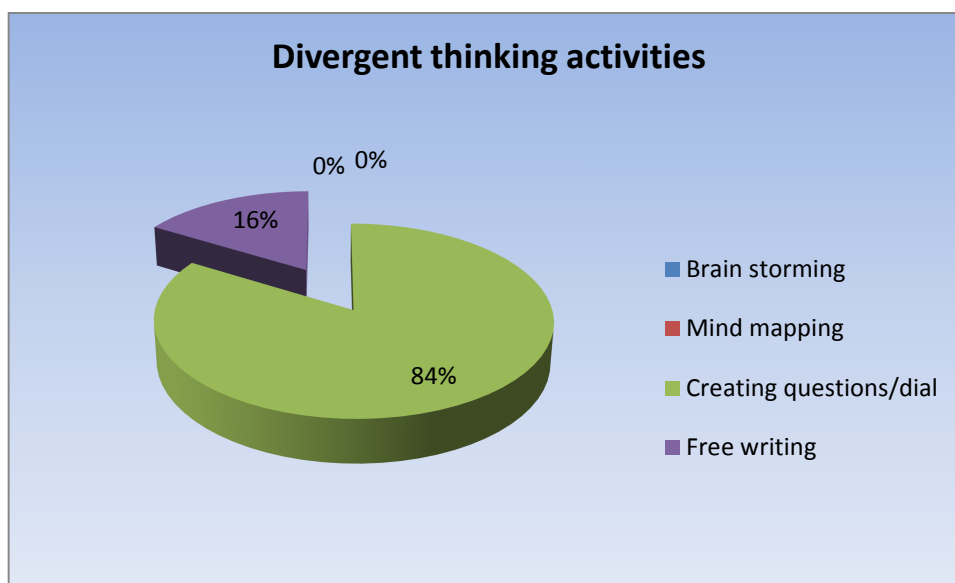
3. How often do you incorporate the following activities in your teaching practices: filling in the blanks, multiple choice, matching, identifying, comparing and contrasting?



Knowing that the activities of convergent thinking are easily found in the textbooks that are applied daily in classes and also when designing tests, we included questions with fill-in the blanks, multiple choice activities, etc, which are those that help students use their stored knowledge to find the best alternative that will help them to solve a problem, we asked this question with the purpose of knowing the frequency that the teachers use the activities outlined in their teaching practices. And

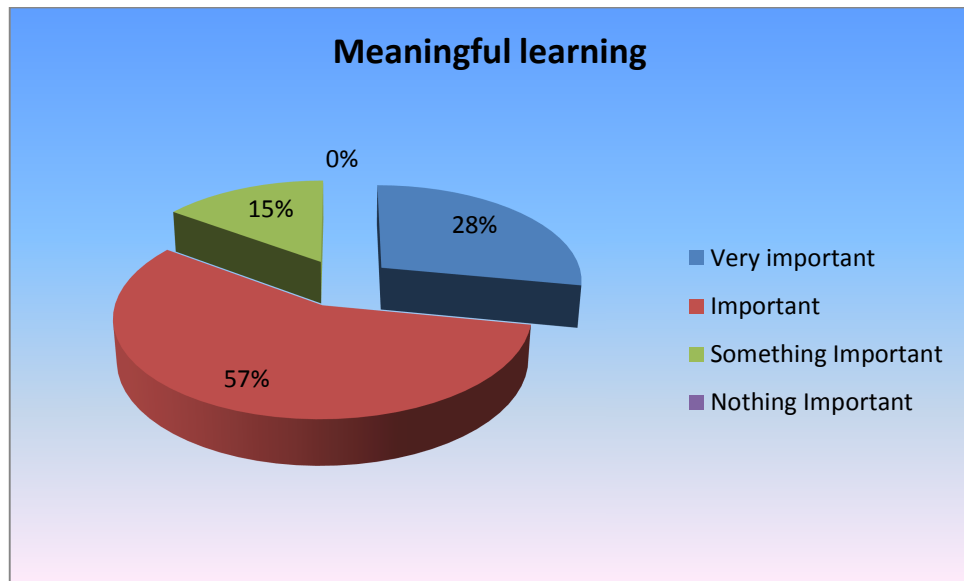
it can be appreciated that a 57% of teachers always use them, a 29% often, and 14% sometimes.

4. Which of the following activities have you incorporated into your teaching practices: brainstorming, mind mapping, creating questions/ dialogs and free writing?



This question was directed in order to know whether some of the activities that have to do with divergent thinking are being incorporated in the teaching practices and as we can see in the graphic, creating dialogs and questions were the activities with higher percentage 84%; free writing presents a 16%. On the other hand, there are two activities that were not taken into account such as: brainstorming and mind mapping.

5. Do you think it is important to promote the meaningful learning in class?
- a. very important b. important c. somewhat important d. not important



It is seen that 57% of teachers consider the meaningful learning important; a 28% consider it very important and only a 15% consider the meaningful learning as somewhat important.

4.2 ANALYSIS OF RESULTS

The following tables show different results gotten by students when the Pre-test was applied to the control and the experimental groups:

4.2.1 PRE-TEST OF CONTROL AND EXPERIMENTAL GROUPS

"DR. FRANCISCO CAMPOS COELLO" PUBLIC HIGH SCHOOL"

THIRD YEAR BACHELOR

PRE TEST

NO	CONTROL GROUP	EXPERIMENTAL GROUP
1	13	15
2	17	16
3	15	13
4	15	14
5	12	17
6	18	18
7	17	17
8	13	17
9	14	12
10	18	13
11	17	15
12	14	16
13	15	14
14	19	18
15	18	13
16	13	15
17	10	18
18	16	16
19	12	14
20	13	13
21	15	16
22	11	16
23	12	17
24	18	17
25	15	18
26	14	18
27	16	13
28	12	14
29	17	17
30	13	12
31	14	15
32	18	13
33	15	16
34	11	14
35	19	13
36	17	17

NO	CONTROL GROUP	EXPERIMENTAL GROUP
37	17	18
38	10	14
39	18	11
40	16	12
41	14	17
42	18	19
43	13	13
44	17	12
45	16	18
46	17	17
47	13	11
48	17	10
49	12	16
50	14	15
51	18	17
52	17	13
53	16	15
54	15	14
55	17	11
56	16	19
57	18	15
58	13	13
59	17	12
60	16	18
61	17	17
62	13	11
63	17	10
64	12	16
65	14	15
66	13	13
67	17	12
68	16	18
69	17	17
70	13	11
71	17	10
72	12	16
73	14	15
74	18	17
75	13	17
76	14	12
77	18	13
78	17	15
79	14	16
80	15	14

NO	CONTROL GROUP	EXPERIMENTAL GROUP
81	19	18
82	18	13
83	13	15
84	10	18
85	16	16
86	12	14
87	18	13
88	17	16
89	16	16
90	15	17
91	17	15
92	16	12
93	18	11
94	13	14
95	14	19
	1443	1429

PRE TEST CALCULATION

DR. FRANCISCO CAMPOS COELLO "PUBLIC HIGH SCHOOL"
 THIRD YEAR BACHELOR
 CONTROL CROUP
 PRE-TEST

Nº	STUDENT'S NAMES	TEST	$X_i - \bar{X}$	$X_i - \bar{X}$	S^2
1	AGUILA LLANOS CARMEN	13	-2,19	-2,19	4,7961
2	ALAMA JAMA DIANA	17	1,81	1,81	3,2761
3	ALCIVAR HERDOIZA EDITH	15	-0,19	-0,19	0,0361
4	ALVARADO BRAVO EDWIN	15	-0,19	-0,19	0,0361
5	BAQUE TIGUA YARITZA	12	-3,19	-3,19	10,1761
6	CAMPUZANO SUAREZ TALIA	18	2,81	2,81	7,8961
7	CARRIEL GONZALEZ ANTHONY	17	1,81	1,81	3,2761
8	CASTILLO ALVARADO EMILY	13	-2,19	-2,19	4,7961
9	GARCIA PACHECO JOYCE	14	-1,19	-1,19	1,4161
10	GONZALEZ QUIÑONEZ WENDY	18	2,81	2,81	7,8961
11	JAIME RUIZ BERLIN ADRIAN	17	1,81	1,81	3,2761
12	LLERENA BARRETO CHRISTIAN	14	-1,19	-1,19	1,4161
13	LUCAS MERA JAMILETH	15	-0,19	-0,19	0,0361
14	MERA PIGUAVE CARLOS	19	3,81	3,81	14,5161
15	MORAN MIRANDA GABRIEL	18	2,81	2,81	7,8961
16	MORENO GARCIA RONNY	13	-2,19	-2,19	4,7961
17	OCHOA PACHECO ADRIAN	10	-5,19	-5,19	26,9361
18	ORTIZ VIZUETA MARIUXI	16	0,81	0,81	0,6561
19	PACAHY PACHAR VERONICA	12	-3,19	-3,19	10,1761
20	PALACIOS AMAYA JOSUE	15	-0,19	-0,19	0,0361
21	PALMA JIMENEZ KAREN	15	-0,19	-0,19	0,0361
22	PERALTA GONZALEZ TANIA	11	-4,19	-4,19	17,5561
23	PEREZ PEÑA ANA PATRICIA	16	0,81	0,81	0,6561
24	PEÑA MORA ANTHONY	15	-0,19	-0,19	0,0361
25	PIGUAVE BURGOS INGRID	16	0,81	0,81	0,6561
26	PROAÑO PEREA GINGER	13	-2,19	-2,19	4,7961
27	ROMERO ABRIL CISSELA	11	-4,19	-4,19	17,5561
28	ROSARIO BAJAÑA CRISTHOFER	12	-3,19	-3,19	10,1761
29	SILVA LUNA RICHARD	18	2,81	2,81	7,8961
30	VANEGAS JORDAN CATHERINE	15	-0,19	-0,19	0,0361
31	VEGA ISQUIERDO BLANCA	14	-1,19	-1,19	1,4161
32	VILLALVA MACIAS EDWIN	16	0,81	0,81	0,6561
33	BECERRA SOLIS GIANELLA	12	-3,19	-3,19	10,1761
34	BRAVO ROJAS ANA NARCISA	17	1,81	1,81	3,2761
35	CARPIO ALCIVAR MARIA	13	2,19	2,19	4,7961
36	CENTENO PIGUAVE MARIA	14	1,19	1,19	1,4161
37	CEVALLOS RODRIGUEZ	18	2,81	2,81	7,8961

Nº	STUDENT'S NAMES	TEST	$X_i - \bar{X}$	$X_i - \bar{X}$	S^2
38	CONSTATINE ZEA FABRICIO	15	-0,19	-0,19	0,0361
39	CORDOVA QUIIJE JULITZA	11	-4,19	-4,19	17,5561
40	GAVILANEZ ANDRADE DEYSY	19	3,81	3,81	14,5161
41	GONZALEZ MERCHAN JENNY	17	1,81	1,81	3,2761
42	GUERRERO SOTOMAYOR	17	1,81	1,81	3,2761
43	JIJON CARRERA JUSTIN	10	-5,19	-5,19	26,9361
44	LEON ARREAGA KEYLA	18	2,81	2,81	7,8961
45	LINO CEDEÑO BRYAN	16	0,81	0,81	0,6561
46	LOZADO MERA ANTHONY	14	-1,19	-1,19	1,4161
47	MATA PONGUILLO MICHELLA	18	2,81	2,81	7,8961
48	MONSERRATE PARRA	13	-2,19	-2,19	4,7961
49	MUZZLO CATELLAR LADDY	17	1,81	1,81	3,2761
50	NOBOA ZUÑIGA MICHELLE	16	0,81	0,81	0,6561
51	OLALLA BOZA WHIMPER	17	1,81	1,81	3,2761
52	ORELLANA CHOEZ JOSELYN	13	-2,19	-2,19	4,7961
53	PACHECO DONOSO JOSE	17	1,81	1,81	3,2761
54	PIZA HIDALGO MARIA FERNANDA	12	-3,19	-3,19	10,1761
55	PLUAS RONQUILLO ALEXANDRA	13	-2,19	-2,19	4,7961
56	PORTOCARRERO ANGULO	17	1,81	1,81	3,2761
57	REYES CUNALATA ANDREINA	15	-0,19	-0,19	0,0361
58	SANABRIA PIGUAVE JORGE	18	2,81	2,81	7,8961
59	SANCHEZ YANQUI ANGIE	14	-1,19	-1,19	1,4161
60	SEGURA POSLIGUA CINTHIA	16	0,81	0,81	0,6561
61	VERA BRIONES NIXON	17	1,81	1,81	3,2761
62	VERA LOZANO CESAR JESUS	17	1,81	1,81	3,2761
63	VILEMA CHANCAY JULIO	17	1,81	1,81	3,2761
64	ALBAN VASQUEZ AMANDA	13	-2,19	-2,19	4,7961
65	ALCIVAR NARVAEZ BOSCO	11	-4,19	-4,19	17,5561
66	ALAMENDARES BRAGANZA	18	2,81	2,81	7,8961
67	ANDREDE VACA RENATA	15	-0,19	-0,19	0,0361
68	ARTEAGA MEDINA KATTIA	14	-1,19	-1,19	1,4161
69	AYOVI ROMERO KARLA	18	2,81	2,81	7,8961
70	BAQUE ECHEVER DANNY	17	1,81	1,81	3,2761
71	BASTIDAS ALMEIDA GINA	13	-2,19	-2,19	4,7961
72	BENAVIDES CERNA PAOLA	14	-1,19	-1,19	1,4161
73	BERMUDEZ BAQUE KEVIN	17	1,81	1,81	3,2761
74	BRIONES AVELLAN KAREN	16	0,81	0,81	0,6561
75	BRITO OBANDO JANATHAN	15	-0,19	-0,19	0,0361
76	CAICEDO VALENCIA NARCISA	13	-2,19	-2,19	4,7961
77	CAMPOVERDE ANDRADE	14	-1,19	-1,19	1,4161
78	CANDO MALLA YADIRA	18	2,81	2,81	7,8961
79	CARBO PINCAY HENRY	15	-0,19	-0,19	0,0361
80	CARDENAS DUEÑAS BRIGGE	16	0,81	0,81	0,6561
81	CARPIO ALCIVAR MARIA	13	-2,19	-2,19	4,7961

N°	STUDENT'S NAMES	TEST	$X_i - \bar{X}$	$X_i - \bar{X}$	S^2
FERNANDA					
82	CARVAJAL ZANDE BRYAN	14	-1,19	-1,19	1,4161
83	CEDEÑO HERRERA HAYLIS	18	2,81	2,81	7,8961
84	CHANGO MOYOLEMA LADY	17	1,81	1,81	3,2761
85	CHOCA YUPA DAVID ISAIAS	16	0,81	0,81	0,6561
86	CHOEZ PERALTA KATHERINE	15	-0,19	-0,19	0,0361
87	CORDERO CHAVEZ ALBERTO	17	1,81	1,81	3,2761
88	CRUZ ESTRELLA JACKELINE	16	0,81	0,81	0,6561
89	DIAZ DIAZ MELANI	18	2,81	2,81	7,8961
90	ESCOBAR NOBOA ANDREA	13	-2,19	-2,19	4,7961
91	FIALLOS ALVAREZ ANGELA	14	-1,19	-1,19	1,4161
92	FRIRE CARPIO JOSELYNE	18	2,81	2,81	7,8961
93	FUENTES GONZALEZ DIANA	17	1,81	1,81	3,2761
94	GALARZA ALAY ANA	16	0,81	0,81	0,6561
95	GARCIA MORE DENISSE	13	-2,19	-2,19	4,7961
		1443	0,00	0,0	
MEAN					

DR. FRANCISCO CAMPOS COELLO "PUBLIC HIGH SCHOOL"
 THIRD YEAR BACHELOR
 EXPERIMENTAL GROUP
 PRE-TEST

Nº	STUDENT'S NAMES	TEST	$X_i - \bar{X}$	$X_i - \bar{X}$	S^2
1	CHEVEZ HERNANDEZ	15	15,00	-0,04	0,0016
2	CHANCAY SUPO	16	16,00	0,96	0,9216
3	LEON ANGULO	13	13,00	-2,04	4,1616
4	MIRANDA BODERO	14	14,00	-1,04	1,0816
5	MIRANDA MIRANDA	17	17,00	1,96	3,8416
6	MORGROVEJO	18	18,00	2,96	8,7616
7	MONTES ALCIVAR	17	17,00	1,96	3,8461
8	MOREIRA RAMIREZ	17	17,00	1,96	3,8416
9	MORENOMONGUE	12	12,00	-3,04	9,2416
10	MORENO VILLALBA	13	13,00	-2,04	4,1616
11	MORENO VILLALBA	15	15,00	-0,04	0,0016
12	MURILLO ORTEGA	16	16,00	0,96	0,9216
13	MURILLO ZAMBRANO	14	14,00	-1,04	1,0816
14	MUÑOS CEDEÑO	18	18,00	2,96	8,7616
15	NAVARRETE RIVERA	13	13,00	-2,04	4,1616
16	NIETO VERA	15	15,00	-0,04	0,0016
17	NIEVES ROSERO	18	18,00	2,96	8,7616
18	OBANDO MERELO	16	16,00	0,96	0,9216
19	ORELLANA MOREIRA	14	14,00	-1,04	1,0816
20	OÑA CAMPOVERDE	13	13,00	-2,04	4,1616
21	PAREDES GOMEZ	16	16,00	0,96	0,9216
22	PASMIÑO TORRES	16	16,00	0,96	0,9216
23	PEREA VALDEZ	17	17,00	1,96	3,8416
24	PEREZ AYALA	17	17,00	1,96	3,8416
25	PLUAS FLORES	18	18,00	2,96	8,7616
26	PODESTA DIAZ	18	18,00	2,96	8,7616
27	PONCE VERA	13	13,00	-2,04	4,1616
28	PUCHUELA SALINAS	14	14,00	-1,04	1,0816
29	PUENTE VELEZ	17	17,00	1,96	3,8416
30	QUIROGA CALLE	12	12,00	-3,04	9,2416
31	QUIÑONEZ OSORIO	15	15,00	-0,04	0,0016
32	RODRIGUEZ CUERO	13	13,00	-2,04	4,1616
33	SANCHEZ MORA	16	16,00	0,96	0,9216
34	SIGUENZA ANDRADE	17	17,00	1,96	3,8416
35	SOLIS CAMPOZANO	11	11,00	-4,04	16,3216
36	SOLIZ MENDEZ	14	14,00	-1,04	1,0816
37	SORIANO CARRANZA	18	18,00	2,96	8,7616
38	SOTO SANTILLAN	17	17,00	1,96	3,8416
39	SUAREZ TROYA	16	16,00	0,96	0,9216

Nº	STUDENT'S NAMES	TEST	$X_i - \bar{X}$	$X_i - \bar{X}$	S^2
40	TOMALA MEDINA	13	13,00	-2,04	4,1616
41	VARGAS BAJAÑA	11	11,00	-4,04	16,3216
42	VARGAS MENDOZA	15	15,00	-0,04	0,0016
43	VEGA GRANDA	18	18,00	2,96	8,7616
44	VILLALVA CHICAIZA	17	17,00	1,96	3,8416
45	VILLAMAR SOTO	15	15,00	-0,04	0,0016
46	VINCES PATIN	13	13,00	-2,04	4,1616
47	ZAMORA SUAREZ	16	16,00	0,96	0,9216
48	ARZUBE RUIZ	14	14,00	-1,04	1,0816
49	CHAVEZ DUEÑAS	13	13,00	-2,04	4,1616
50	CHINGA CARVAJAL	17	17,00	1,96	3,8416
51	ESPINOZA RENDON	18	18,00	2,96	8,7616
52	FERNANDEZ ALVARADO	14	14,00	-1,04	1,0816
53	GALARZA LAYANA	11	11,00	-4,04	16,3216
54	GAVILANEZ CORDOVA	12	12,00	-3,04	9,2416
55	HUACON CHIRIGUA	17	17,00	1,96	3,8416
56	LEON BAQUERIZO	19	19,00	3,96	15,6816
57	PEÑA ARIAS	13	13,00	-2,04	4,1616
58	PEÑAFIEL BAQUE	12	12,00	-3,04	9,2416
59	PEÑARIETA ARONI	14	14,00	-1,04	1,0816
60	PROAÑO HIDALGO	16	16,00	0,96	0,9216
61	ROCHA SUAREZ	17	17,00	1,96	3,8416
62	ROSALES ROMO	16	16,00	0,96	0,9216
63	SATIAN ALCOSER	13	13,00	-20,4	4,1616
64	SUAREZ SEVERINO	12	12,00	-3,04	9,2416
65	VALENCIA CEVALLOS	18	18,00	2,96	8,7616
66	VERDESOTO ALAVA	17	17,00	1,96	3,8416
67	ZAMBRANO CASTRO	11	11,00	-4,04	16,3216
68	ZAMBRANO ROCA	10	10,00	-5,04	25,4016
69	ALCIVAR BARZOLA	16	16,00	0,96	0,9216
70	ALVARADO TOMALA	15	15,00	-0,04	0,0016
71	ANGULO GANCHOZO	17	17,00	1,96	3,8416
72	ARGUELLO PEÑAFIEL	13	13,00	-2,04	4,1616
73	ARONI SANTA MARIA	15	15,00	-0,04	0,0016
74	ARREAGA TORRES	14	14,00	-1,04	1,0816
75	BARCIA SUAREZ	11	11,00	-4,04	16,3216
76	CARRANZA LABANDO	19	19,00	3,96	15,6816
77	CARRILLO GUARICO	17	17,00	1,96	3,8416
78	CARRION CONDE	16	16,00	0,96	0,9216
79	CEDEÑO HURTADO	17	17,00	1,96	3,8416
80	CELORIO ANDRADE	16	16,00	0,96	0,9216
81	CHICHANZA POZO	15	15,00	-0,04	0,0016
82	CHILLAMBO CASIER	16	16,00	0,96	0,9216
83	CHICHANDE CORREA	14	14,00	-1,04	1,0816
84	CRISPHIN ROMERO	13	13,00	-2,04	4,1616

N°	STUDENT'S NAMES	TEST	$X_i - \bar{X}$	$X_i - \bar{X}$	S^2
85	DE LA CRUZ LABAN	16	16,00	0,96	0,9216
86	DIAZ ALVARIO	16	16,00	0,96	0,9216
87	GARZON LUGO	17	17,00	1,96	3,8416
88	GOMEZ ROCAFUERTE	15	15,00	-0,04	0,0016
89	GUAGUA SALAVA	12	12,00	-3,04	9,2416
90	GUERRA DOMINGUEZ	11	11,00	-4,04	16,3216
91	IÑEGUEZ IÑEGUEZ	14	14,00	-1,04	1,0816
92	LEON MEDINA	19	19,00	3,96	15,6816
93	LINDAO MITE	17	17,00	1,96	3,8416
94	LOOR COLOBON	15	15,00	-0,04	0,0016
95	LOOR VARGAS	12	12,00	-3,04	9,2416
		1429	1429,00	0	463,8365
MEAN					

-Statistical representation of the Pre-test in the Control and Experimental groups

POST TEST	CONTROL GROUP	EXPERIMENTAL GROUP
SAMPLE MEAN	$x_1 = \frac{\sum x_i}{n_1} = \frac{1443}{95} = 15,189$	$x_1 = \frac{\sum x_i}{n_2} = \frac{1429}{95} = 15,04$
VARIANCE OF SAMPLE	$s_1^2 = \frac{(\sum x_{i1} - x_1)^2}{n_1 - 1} = \frac{1427,811}{94} = 15,2$	$s_1^2 = \frac{(\sum x_{i1} - x_1)^2}{n_1 - 1} = \frac{1413,95}{94} = 15,04$
STANDARD DEVIATION	$s_{x1} = \sqrt{15,20} = 3,89$	$s_{x1} = \sqrt{15,04} = 3,88$

4.2.2 POST-TEST OF THE CONTROL AND EXPERIMENTAL GROUPS.

DR. FRANCISCO CAMPOS COELLO "PUBLIC HIGH SCHOOL"
THIRD YEAR BACHELOR
POST
TEST

N°	CONTROL GROUP	EXPERIMENTAL GROUP
1	12	17
2	16	16
3	17	15
4	14	17
5	12	15
6	16	17
7	16	19
8	14	16
9	13	17
10	16	15
11	18	18
12	15	14
13	13	15
14	17	16
15	15	15
16	14	18
17	12	19
18	13	17
19	14	14
20	13	14
21	14	18
22	12	13
23	15	18
24	14	19
25	15	17
26	15	18
27	13	15
28	13	18
29	17	15
30	15	17
31	13	18
32	15	15
33	13	17
34	16	14
35	14	16

N°	CONTROL GROUP	EXPERIMENTAL GROUP
36	15	16
37	16	17
38	16	19
39	12	18
40	17	16
41	18	14
42	15	17
43	13	17
44	15	17
45	13	16
46	13	18
47	17	17
48	14	12
49	15	16
50	15	18
51	16	18
52	11	15
53	18	13
54	13	16
55	15	16
56	15	20
57	14	16
58	17	15
59	15	17
60	14	14
61	16	15
62	18	18
63	16	19
64	13	15
65	12	17
66	17	19
67	13	13
68	17	15
69	19	15
70	16	18
71	14	19
72	12	16
73	14	16
74	11	13
75	13	16
76	14	17
77	11	19
78	17	15
79	12	19

N°	CONTROL GROUP	EXPERIMENTAL GROUP
80	14	18
81	15	16
82	15	18
83	13	19
84	15	15
85	15	19
86	17	16
87	13	18
88	14	17
89	17	14
90	15	13
91	10	17
92	19	20
93	16	19
94	13	16
95	18	14

THIRD YEAR BACHELOR
CONTROL CROUP
POST-TEST

Nº	STUDENT'S NAMES	TEST	$X_i - \bar{X}$	$X_i - \bar{X}$	S^2
1	AGUILA LLANOS CARMEN	12	-2,63	-2,63	6,9169
2	ALAMA JAMA DIANA	16	1,37	1,37	1,8769
3	ALCIVAR HERDOIZA EDITH	17	2,37	2,37	5,6169
4	ALVARADO BRAVO EDWIN	14	-0,63	-0,63	0,3969
5	BAQUE TIGUA YARITZA	12	-2,63	-2,63	6,9169
6	CAMPUZANO SUAREZ TALIA	16	1,37	1,37	1,8769
7	CARRIEL GONZALEZ ANTHONY	16	1,37	1,37	1,8769
8	CASTILLO ALVARADO EMILY	14	-0,63	-0,63	0,3969
9	GARCIA PACHECO JOYCE	13	-1,63	-1,63	2,6569
10	GONZALEZ QUIÑONEZ WENDY	16	1,37	1,37	1,8769
11	JAIME RUIZ BERLIN ADRIAN	18	3,37	3,37	11,3569
12	LLERENA BARRETO CHRISTIAN	15	0,37	0,37	0,1369
13	LUCAS MERA JAMILETH	13	-1,63	-1,63	2,6569
14	MERA PIGUAVE CARLOS	17	2,37	2,37	5,6169
15	MORAN MIRANDA GABRIEL	15	0,37	0,37	0,1369
16	MORENO GARCIA RONNY	14	-0,63	-0,63	0,3969
17	OCHOA PACHECO ADRIAN	12	-2,63	-2,63	6,9169
18	ORTIZ VIZUETA MARIUXI	13	-1,63	-1,63	2,6569
19	PACAHY PACHAR VERONICA	14	-0,63	-0,63	0,3969
20	PALACIOS AMAYA JOSUE	13	-1,63	-1,63	2,6569
21	PALMA JIMENEZ KAREN	14	-0,63	-0,63	0,3969
22	PERALTA GONZALEZ TANIA	12	-2,63	-2,63	6,9169
23	PEREZ PEÑA ANA PATRICIA	15	0,37	0,37	0,1369
24	PEÑA MORA ANTHONY	14	-0,63	-0,63	0,3969
25	PIGUAVE BURGOS INGRID	15	0,37	0,37	0,1369
26	PROAÑO PEREA GINGER	15	0,37	0,37	0,1369
27	ROMERO ABRIL CISSELA	13	-1,63	-1,63	2,6569
28	ROSARIO BAJAÑA CRISTHOFER	13	-1,63	-1,63	2,6569
29	SILVA LUNA RICHARD	17	2,37	2,37	5,6169
30	VANEGAS JORDAN CATHERINE	15	0,37	0,37	0,1369
31	VEGA ISQUIERDO BLANCA	13	-1,63	-1,63	2,6569
32	VILLALVA MACIAS EDWIN	15	0,37	0,37	0,1369
33	BECERRA SOLIS GIANELLA	13	-1,63	-1,63	2,6569
34	BRAVO ROJAS ANA NARCISA	16	1,37	1,37	1,8769
35	CARPIO ALCIVAR MARIA	14	-0,63	-0,63	0,3969

N°	STUDENT'S NAMES	TEST	$X_i - \bar{X}$	$X_i - \bar{X}$	S^2
36	CENTENO PIGUAVE MARIA	15	0,37	0,37	0,1369
37	CEVALLOS RODRIGUEZ	16	1,37	1,37	1,8769
38	CONSTATINE ZEA FABRICIO	16	1,37	1,37	1,8769
39	CORDOVA QUIIJE JULITZA	12	-2,63	-2,63	6,9169
40	GAVILANEZ ANDRADE DEYSY	17	2,37	2,37	5,6169
41	GONZALEZ MERCHAN JENNY	18	3,37	3,37	11,3569
42	GUERRERO SOTOMAYOR	15	0,37	0,37	0,1369
43	JIJON CARRERA JUSTIN	13	-1,63	-1,63	2,6569
44	LEON ARREAGA KEYLA	15	0,37	0,37	0,1369
45	LINO CEDEÑO BRYAN	13	-1,63	-1,63	2,6569
46	LOZADO MERA ANTHONY	13	-1,63	-1,63	2,6569
47	MATA PONGUILLO MICHELLA	17	2,37	2,37	5,6169
48	MONSERRATE PARRA	14	-0,63	-0,63	0,3969
49	MUZZLO CATELLAR LADDY	15	0,37	0,37	0,1369
50	NOBOA ZUÑIGA MICHELLE	15	0,37	0,37	0,1369
51	OLALLA BOZA WHIMPER	16	1,37	1,37	1,8769
52	ORELLANA CHOEZ JOSELYN	11	-3,63	-3,63	13,1769
53	PACHECO DONOSO JOSE	18	3,37	3,37	11,3569
54	PIZA HIDALGO MARIA FERNANDA	13	-1,63	-1,63	2,6569
55	PLUAS RONQUILLO ALEXANDRA	15	0,37	0,37	0,1369
56	PORTOCARRERO ANGULO	15	0,37	0,37	0,1369
57	REYES CUNALATA ANDREINA	14	-0,63	-0,63	0,3969
58	SANABRIA PIGUAVE JORGE	17	2,37	2,37	5,6196
59	SANCHEZ YANQUI ANGIE	15	0,37	0,37	0,1369
60	SEGURA POSLIGUA CINTHIA	14	-0,63	-0,63	0,3969
61	VERA BRIONES NIXON	16	1,37	1,37	1,8769
62	VERA LOZANO CESAR JESUS	18	3,37	3,37	11,3569
63	VILEMA CHANCAY JULIO	16	1,37	1,37	1,8769
64	ALBAN VASQUEZ AMANDA	13	-1,63	-1,63	2,6569
65	ALCIVAR NARVAEZ BOSCO	12	-2,63	-2,63	6,9169
66	ALAMENDARES BRAGANZA	17	2,37	2,37	5,6169
67	ANDREDE VACA RENATA	13	-1,63	-1,63	2,6569
68	ARTEAGA MEDINA KATTIA	17	2,37	2,37	5,6169
69	AYOVI ROMERO KARLA	19	4,37	4,37	19,0969
70	BAQUE ECHEVER DANNY	16	1,37	1,37	1,8769
71	BASTIDAS ALMEIDA GINA	14	-0,63	-0,63	0,3969
72	BENAVIDES CERNA PAOLA	12	2,63	2,63	6,9169
73	BERMUDEZ BAQUE KEVIN	14	-0,63	-0,63	0,3969
74	BRIONES AVELLAN KAREN	11	-3,63	-3,63	13,1769
75	BRITO OBANDO JANATHAN	13	-1,63	-1,63	2,6569

N°	STUDENT'S NAMES	TEST	$X_i - \bar{X}$	$X_i - \bar{X}$	S^2
76	CAICEDO VALENCIA NARCISA	14	-0,63	-0,63	0,3969
77	CAMPOVERDE ANDRADE	11	3,63	3,63	13,1769
78	CANDO MALLA YADIRA	17	2,37	2,37	5,6169
79	CARBO PINCAY HENRY	12	-2,63	-2,63	6,9169
80	CARDENAS DUEÑAS BRIGGE	14	-0,63	-0,63	0,3969
81	CARPIO ALCIVAR MARIA FERNANDA	15	0,37	0,37	0,1369
82	CARVAJAL ZANDE BRYAN	15	0,37	0,37	0,1369
83	CEDEÑO HERRERA HAYLIS	13	-1,63	-1,63	2,6569
84	CHANGO MOYOLEMA LADY	15	0,37	0,37	0,1369
85	CHOCA YUPA DAVID ISAIAS	15	0,37	0,37	0,1369
86	CHOEZ PERALTA KATHERINE	17	2,37	2,37	5,6169
87	CORDERO CHAVEZ ALBERTO	13	-1,63	-1,63	2,6569
88	CRUZ ESTRELLA JACKELINE	14	-0,63	-0,63	0,3969
89	DIAZ DIAZ MELANI	17	2,37	2,37	5,6169
90	ESCOBAR NOBOA ANDREA	15	0,37	0,37	0,1369
91	FIALLOS ALVAREZ ANGELA	10	-4,63	-4,63	21,4369
92	FRIRE CARPIO JOSELYNE	19	4,37	4,37	19,0969
93	FUENTES GONZALEZ DIANA	16	1,37	1,37	1,8769
94	GALARZA ALAY ANA	13	-1,63	-1,63	2,6569
95	GARCIA MORE DENISSE	18	3,37	3,37	11,3569
		1390	0,00	0	352,1055

MEAN

$$\bar{X} = \frac{\sum X_i}{N} = \frac{1390}{95} = 14,632$$

THIRD YEAR
BACHELOR

EXPERIMENTAL
GROUP
POST-TEST

Nº	STUDENT'S NAMES	TEST	Xi -X	Xi -X	S
1	CHEVEZ HERNANDEZ	17	0,55	0,55	0,303
2	CHANCA Y SUPO	16	-0,45	-0,45	0,203
3	LEON ANGULO	15	1,45	1,45	2,103
4	MIRANDA BODERO	17	0,55	0,55	0,303
5	MIRANDA MIRANDA	15	-1,45	-1,45	2,103
6	MORGROVEJO	17	0,55	0,55	0,303
7	MONTES ALCIVAR	19	2,55	2,55	6,503
8	MOREIRA RAMIREZ	16	-0,45	-0,45	0,203
9	MORENOMONGUE	17	0,55	0,55	0,303
10	MORENO VILLALBA	15	-1,45	-1,45	2,103
11	MORENO VILLALBA	18	1,55	1,55	2,403
12	MURILLO ORTEGA	14	-2,45	-2,45	6,003
13	MURILLO ZAMBRANO	15	-1,45	-1,45	2,103
14	MUÑOS CEDEÑO	16	-0,45	-0,45	0,203
15	NAVARRETE RIVERA	15	-1,45	-1,45	2,103
16	NIETO VERA	18	1,55	1,55	2,403
17	NIEVES ROSERO	19	2,55	2,55	6,503
18	OBANDO MERELO	17	0,55	0,55	0,303
19	ORELLANA MOREIRA	14	-2,45	-2,45	6,003
20	OÑA CAMPOVERDE	14	-2,45	-2,45	6,003
21	PAREDES GOMEZ	18	1,55	1,55	2,403
22	PASMIÑO TORRES	13	-3,45	-3,45	11,903
23	PEREA VALDEZ	18	1,55	1,55	2,403
24	PEREZ AYALA	19	2,55	2,55	6,503
25	PLUAS FLORES	17	0,55	0,55	0,303
26	PODESTA DIAZ	18	1,55	1,55	2,403
27	PONCE VERA	15	-1,45	-1,45	2,103
28	PUCHUELA SALINAS	18	1,55	1,55	2,403
29	PUENTE VELEZ	15	-1,45	-1,45	2,103
30	QUIROGA CALLE	17	0,55	0,55	0,303
31	QUIÑONEZ OSORIO	18	1,55	1,55	2,043
32	RODRIGUEZ CUERO	15	-1,45	-1,45	2,013
33	SANCHEZ MORA	17	0,55	0,55	0,303
34	SIGUENZA	14	-2,45	-2,45	6,003

N°	STUDENT'S NAMES	TEST	$\Sigma(X_i - \bar{X})$	$\Sigma(X_i - \bar{X})^2$	S
	ANDRADE				
35	SOLIS CAMPOZANO	16	-0,45	0,203	0,203
36	SOLIZ MENDEZ	16	-0,45	0,203	0,203
37	SORIANO CARRANZA	17	0,55	0,303	0,303
38	SOTO SANTILLAN	19	2,55	6,503	6,503
39	SUAREZ TROYA	18	1,55	2,403	2,403
40	TOMALA MEDINA	16	-0,45	0,203	0,203
41	VARGAS BAJAÑA	14	-2,45	6,003	6,003
42	VARGAS MENDOZA	17	0,55	0,303	0,303
43	VEGA GRANDA	17	0,55	0,303	0,303
44	VILLALVA CHICAIZA	17	0,55	0,303	0,303
45	VILLAMAR SOTO	16	-0,45	0,203	0,203
46	VINCES PATIN	18	1,55	2,403	2,403
47	ZAMORA SUAREZ	17	0,55	0,303	0,303
48	ARZUBE RUIZ	12	-4,45	19,803	19,803
49	CHAVEZ DUEÑAS	16	-0,45	0,203	0,203
50	CHINGA CARVAJAL	18	1,55	2,403	2,403
51	ESPINOZA RENDON	18	1,55	2,403	2,403
52	FERNANDEZ ALVARADO	15	-1,45	2,103	2,103
53	GALARZA LAYANA	13	-3,45	11,903	11,903
54	GAVILANEZ CORDOVA	16	-0,45	0,203	0,203
55	HUACON CHIRIGUA	16	-0,45	0,203	0,203
56	LEON BAQUERIZO	20	3,55	12,603	12,603
57	PEÑA ARIAS	16	-0,45	0,203	0,203
58	PEÑAFIEL BAQUE	15	-1,45	2,103	2,103
59	PEÑARIETA ARONI	17	0,55	0,303	0,303
60	PROAÑO HIDALGO	14	-2,45	6,003	6,003
61	ROCHA SUAREZ	15	-1,45	2,103	2,103
62	ROSALES ROMO	18	1,55	2,403	2,403
63	SATIAN ALCOSER	19	2,55	6,503	6,503
64	SUAREZ SEVERINO	15	-1,45	2,103	2,103
65	VALENCIA CEVALLOS	17	0,55	0,303	0,303
66	VERDESOTO ALAVA	19	2,55	6,503	6,503
67	ZAMBRANO CASTRO	13	-3,45	11,903	11,903
68	ZAMBRANO ROCA	15	-1,45	2,103	2,103
69	ALCIVAR BARZOLA	15	-1,45	2,103	2,103
70	ALVARADO TOMALA	18	1,55	2,403	2,403
71	ANGULO GANCHOZO	19	2,55	6,503	6,503
72	ARGUELLO	16	-0,45	0,203	0,203

N°	STUDENT'S NAMES	TEST	Xi -X	Xi -X	S
PEÑAFIEL					
73	ARONI SANTA MARIA	16	-0,45	-0,45	0,203
74	ARREAGA TORRES	13	-3,45	-3,45	11,903
75	BARCIA SUAREZ	16	-0,45	-0,45	0,203
76	CARRANZA LABANDO	17	0,55	0,55	0,303
77	CARRILLO GUARICO	19	2,55	2,55	6,503
78	CARRION CONDE	15	-1,45	-1,45	2,103
79	CEDEÑO HURTADO	19	2,55	2,55	6,503
80	CELORIO ANDRADE	18	1,55	1,55	2,403
81	CHICHANZA POZO	16	-0,45	-0,45	0,203
82	CHILLAMBO CASIER	18	1,55	1,55	2,403
83	CHICHANDE CORREA	19	2,55	2,55	6,503
84	CRISPHIN ROMERO	15	-1,45	-1,45	2,103
85	DE LA CRUZ LABAN	19	2,55	2,55	6,503
86	DIAZ ALVARIO	16	-0,45	-0,45	0,203
87	GARZON LUGO	18	1,55	1,55	2,403
88	GOMEZ ROCAFUERTE	17	0,55	0,55	0,303
89	GUAGUA SALAVA	14	-2,45	-2,45	6,003
90	GUERRA DOMINGUEZ	13	-3,45	-3,45	11,903
91	IÑEGUEZ IÑEGUEZ	17	0,55	0,55	0,303
92	LEON MEDINA	20	3,55	3,55	12,603
93	LINDAO MITE	19	2,55	2,55	6,503
94	LOOR COLOBON	16	-0,45	-0,45	0,203
95	LOOR VARGAS	14	-2,45	-2,45	6,003
		1563	0,00	0	311,538

MEAN

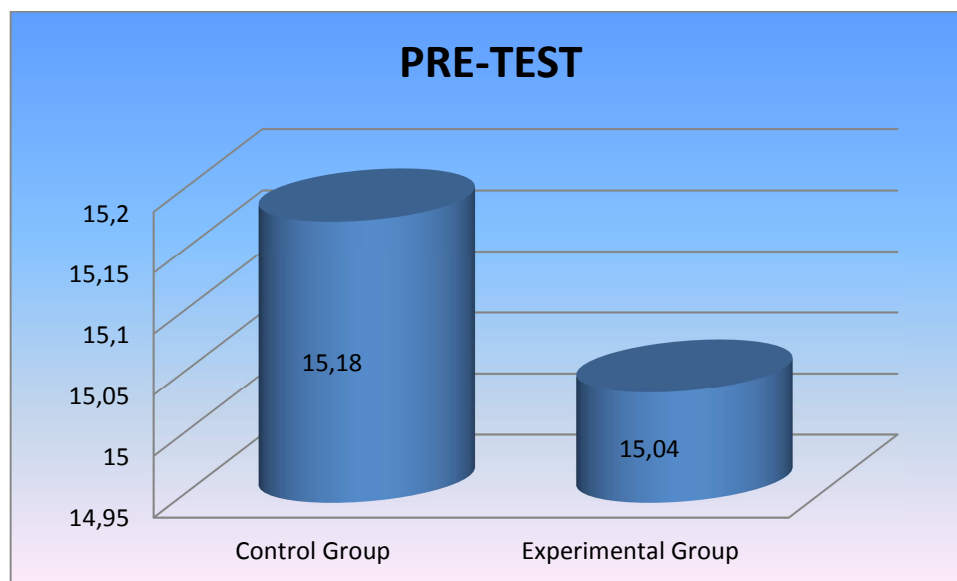
$$\bar{X} = \frac{\sum X_i}{N} = \frac{1590}{95} = 16,453$$

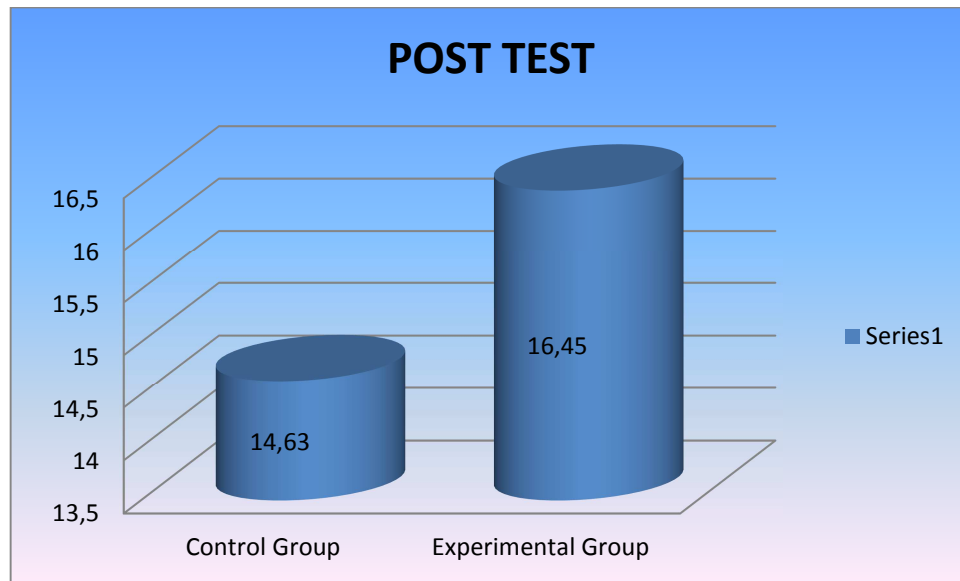
-Statistical Representation of the Post-test in the Control and Experimental Groups

POST TEST	CONTROL GROUP	EXPERIMENTAL GROUP
SAMPLE	n1= 95	n2=95
MEAN	$x_1 = \frac{\sum x_i}{95} = \frac{1390}{95} = 14,63$	$x_1 = \frac{\sum x_i}{95} = \frac{1563}{95} = 16,453$
VARIANCE OF SAMPLE	$s_1^2 = \frac{(\sum x_{i1} - x_1)^2}{n_{1-1}} = \frac{1375,37}{94} = 14,6$	$s_1^2 = \frac{(\sum x_{i1} - x_1)^2}{n_{1-1}} = \frac{1546,547}{94} = 16,4$
STANDARD DEVIATION	$s_{x1} = \sqrt{14,60} = 3,82$	$s_{x1} = \sqrt{16,40} = 4,04$

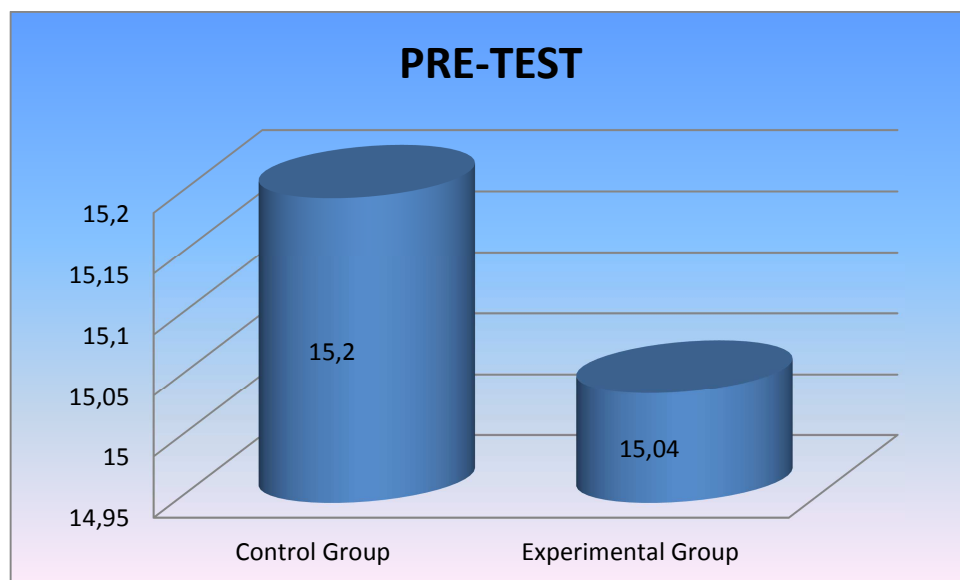
4.2.3 GRAPHIC DIFFERENCES OF THE RESULTS OF THE PRE-POST TESTS

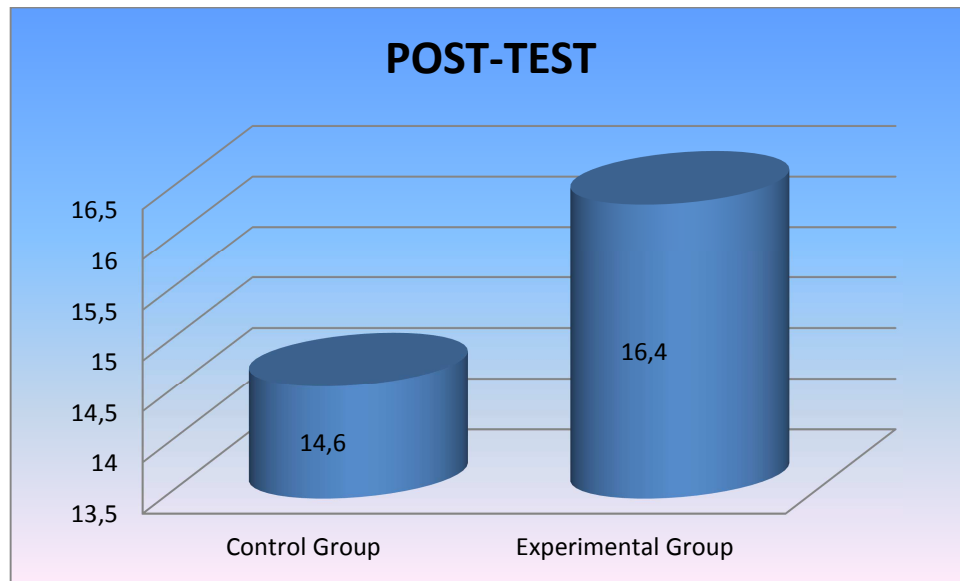
4.2.3.1 MEAN



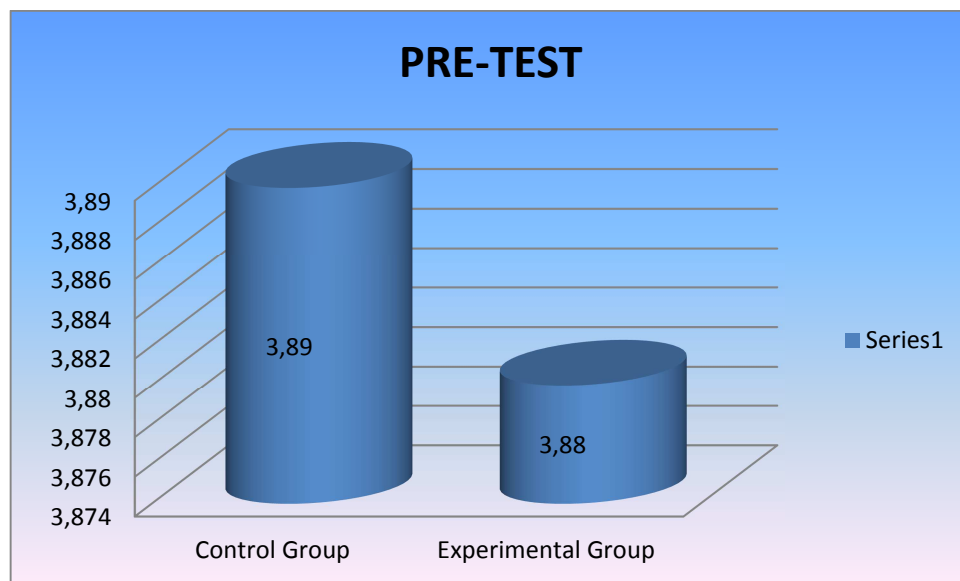


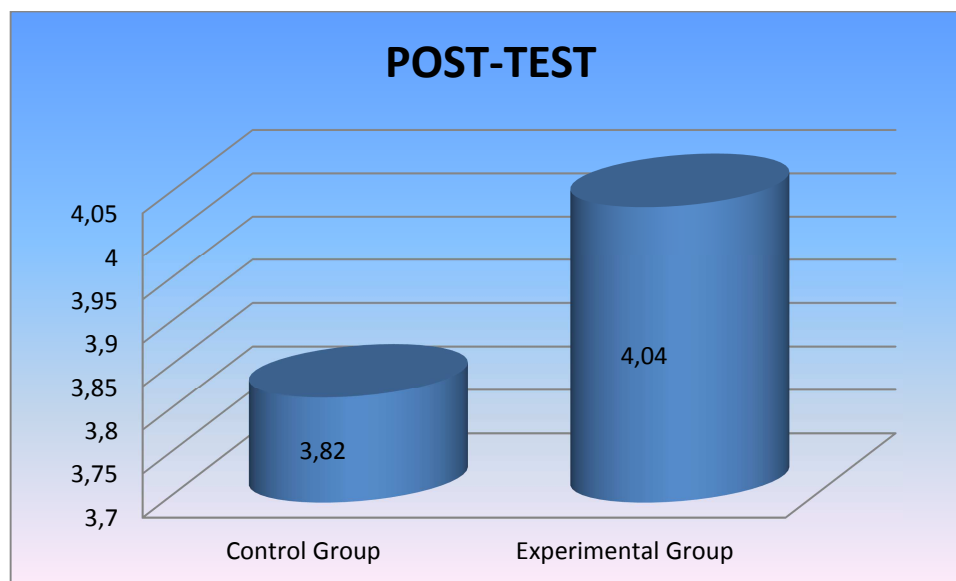
4.2.3.2 VARIANCE





4.2.3.3 STANDARD DEVIATION





4.3 CONCLUSIONS

The working hypothesis which states that the convergent and divergent thinking will promote the meaningful learning in the English classroom on students of the third year of Bachelor at “Francisco Campos Coello” high school in Guayaquil during the first quimestre of the school year 2013-2014 is accepted because the results can be compared and contrasted when analysing the basic statistical factors in the pre-test and the post-test in the experimental group. Besides, after analysing the data, the final result is of 3,93 proves that the experimental group has got better results after having applied the convergent and divergent thinking techniques. It can be assured that the working hypothesis is valid and the null and alternative hypotheses can be rejected. Also, the working hypothesis is accepted because of the following reasons:

1. The use of convergent and divergent thinking activities promoted the meaningful learning in the classroom.

2. The divergent and convergent thinking activities really developed the creative thinking and analysis in the classroom

It is clear that the students who participated in the experiment have gained a good benefit in the development of their skills in the English language. Students experienced situations with the use of techniques which correspond to convergent and divergent thinking where they had to use their prior knowledge to solve a problem in a learning situation and also analyze problems from different perspectives to generate new ideas that contributed to the development of their creative thinking,

Creative thinking in the classroom plays a very important role since it contributes successfully with the new trend in the teaching of English where learning is for communication. Practices should be seen as utilitarian and helpful. It aims at not boredom and the fundamental idea is to stimulate and confront the students with their own needs, and help them to understand the importance of this language within that context. It is intended that the language is taught as the mother tongue: by means of real-life situations.

Based on the findings, implementing convergent and divergent thinking is a valuable technique that helps students become more self-directed learners to learn in a meaningful way. Before the experiment the students did not have any class activity with divergent activities like mind mapping and brainstorming, but now students have some knowledge of these activities and teachers are interested in learning more about convergent and divergent thinking.

It is important for the teacher regarding creative education to apply methods and techniques to create an environment that is conducive to thoughtful and

creative thinking in the classroom. It is required for this that the teacher is creative, learns the fundamentals and strategies to enhance and promote the construction of creative abilities in his students.

4.4 RECOMMENDATIONS

It is necessary to continue implementing activities of convergent and divergent thinking in order to promote the meaningful learning in the classroom with the students of the third year of bachelor, since it assists them develop their creative and critical thinking in a better way.

It is very important to adopt the classroom research as an institutional policy, this will allow the teachers to know the problems that exist in the classroom and on the basis of a complete analysis to consider alternative solutions. Classroom research does not only help teachers be more competent, analytical, thoughtful and researchers, but it also aids students in receiving a better education directed especially to solve their learning needs.

In order to get the independence of the students and promote the acquisition of appropriate strategies to achieve meaningful learning, it is necessary to provide teachers with training of a wide range of methods and techniques that give them the necessary tools to promote the dynamism and creativity of students in the classroom.

Teachers should always seek to incorporate classroom activities that awaken the interest and the desire to learn of their students; divergent thinking activities are appropriate to arise curiosity, so it is recommended the adoption of these

types of activities to make it easier for students to solve problems in learning situations, think creatively, make decisions, etc.

PART FIVE

5 PROPOSAL

HOW TO PROMOTE THE EFFECTIVE LEARNING AT THE “DR. FRANCISCO CAMPOS COELLO” PUBLIC HIGH SCHOOL ON THE STUDENTS OF THE THIRD YEAR OF BACHELOR IN GUAYAQUIL DURING THE FIRST QUIMESTRE OF THE SCHOOL YEAR 2013-2014

5.1 INTRODUCTION

New technologies are today understood as a tool for the teacher in the classroom to develop the curriculum, regardless of the subject. So we move away increasingly from the teacher that is limited to the whiteboard and text book to the teacher who uses new methodologies and technologies as a tool not only for learning but as a source of motivation for students.

According to (Hobgood and Obmsby, 2012), new technologies in recent decades have served to promote the use of new methods to English language teaching and learning. To speak of new methodologies is very different from the concept that was valid a few years ago. It is not only the use of the cassette or tape recorders and methods of translation of texts; now it is seeked to use dynamic methods that foster meaningful and cooperative learning.

Now the weight falls on the side of teachers, who have to be adapted to the speed that new technologies and the time imposed by them progresses. Our task as teachers is crucial here: we need to incorporate new technologies and methodologies to our teaching practices, provide materials, resources and ideas to students so that they learn meaningfully.

The first element that stimulates a learning process is the prior knowledge that a student has; therefore, the teacher should implement strategies to allow to connect the new knowledge with the prior one.

(Madrid, 2001) holds that these relationships must be "substantive and not arbitrary". So the student must give meaning to what they want to learn and this is only possible from what is already known (no matter that what he has learnt was little or confusing) and through the modification of schemes and relevant structures in the learning situation. Learning functionality is established from the new cognitive structures, which allow not only to assimilate new knowledge, but also to review, modify and enrich it, establishing new connections and new relationships among them.

The changes in education and incorporation of new challenges demand that Ecuadorian teachers assume the compromise of experimenting new methods and techniques, do everything within their possibilities to grow professionally and in this way develop skills that allow them to address the learning needs of their students and with greater ease face the challenges of the new millennium.

This proposal seeks to provide teachers with enough knowledge about Convergent and Divergent thinking so they can easily apply the critical and creative techniques in the classroom to individualize the teaching in the sense of allowing each student to work independently and at their own pace. But it is necessary to promote collaboration and group work, since they establish better relations with other students, in this way they will learn more, they will feel more love to study, be

more motivated, and they will increase their self-esteem and develop their social skills when they work in cooperative groups.

DESCRIPTION

This proposal consists on designing a module for teachers to develop new skills about convergent and divergent thinking and its application in the classroom. Teachers will review some theories, ideas, tips, and strategies to incorporate these kinds of techniques in the teaching practices and promote the effective learning.

The course will be divided into 3 units, a unit during each week, where the teachers will learn about creative vs. critical thinking, types of learning and the creativity in the classroom.

The first unit will be focused to provide teachers with theories and concepts about types of thinking: convergent and divergent thinking and their methods and techniques such as: reasoning, analyzing, evaluating, decision making, problem solving, evolution, changing direction, etc.

The second unit will be devoted to provide teachers with enough knowledge about the types of learning with the main purpose to be able to differentiate between rote learning and meaningful learning.

The third unit will be focused to provide teachers with ideas, strategies and tips to foster creativity in the classroom and to indeed promote the meaningful learning.

MODULE 1		EFFECTIVE LEARNING IN THE CLASSROOM			
Competency		The student can share ideas, discuss and read articles and essays about types of thinking, meaningful learning and rote learning and creativity in the classroom, apply convergent and divergent thinking to promote the meaningful learning in the classroom with their students.			
Unit	Capacities	Evaluation Criteria	Thematic Axis	Resources and materials	Time
UNIT 1 TYPES OF THINKING	<ul style="list-style-type: none"> Review theories about rote and meaningful learning Establish the conditions for meaningful learning Determine the strategies and tips for achieving meaningful learning in class. Review how to promote effective learning in classroom Analyze the advantages and disadvantages of meaningful and rote learning 	<p>Speaking. Sharing ideas about convergent and divergent thinking</p> <p>Discussing critical and creative thinking: advantages disadvantages</p> <p>Talking about convergent and divergent thinking methods</p> <p>Reading. Article about types of thinking</p> <p>Listening , a video about incorporation of convergent and divergent thinking in classroom</p> <p>Writing, an essay about how to incorporate creative thinking in classroom</p>	1. Convergent and divergent thinking	<p>HUMAN:</p> <ul style="list-style-type: none"> -Students -Teachers -Management Staff <p>MATERIAL:</p> <ul style="list-style-type: none"> -Student book -Workbook -CDs -Board -Computer with internet -Videos -Dictionary -Flashcards 	1 week
			2. Critical and creative thinking		1 week
			3. Convergent and divergent thinking methods and techniques		1 week
			4. Questions for convergent and divergent thinking		1 week
			5. Convergent and divergent thinking exercises		1 week
UNIT 2 TYPES OF LEARNING	<ul style="list-style-type: none"> Review theories about meaningful learning Establish the conditions for 	<p>Speaking. Talking ideas about meaningful learning and the classroom</p> <p>conditions for meaningful learning</p>	1. Rote learning	<p>MATERIAS:</p> <ul style="list-style-type: none"> -Student book -Workbook -CDs -Board 	
		2. Meaningful learning			
		3. Conditions for meaningful learning			

	<p>meaningful learning</p> <ul style="list-style-type: none"> • Determine the strategies and tips for achieving meaningful learning in class • Review how to promote effective learning in classroom • Analyze the advantages and disadvantages of meaningful and rote learning 	<p>Discussing about strategies to achieve meaningful learning and its process Small talk about effective learning Discussing advantages and disadvantages of meaningful vs. rote learning Reading. An internet article about rote and meaningful learning Listening for specific information about effective learning Writing, an essay about the types of learning</p>	<p>4. Strategies to achieve meaningful learning 5. Process of meaningful learning 6. Advantages and disadvantages of meaningful and rote learning</p>	<p>-Computer with internet -Videos -Dictionary -Flashcards</p>	<p>Continue...</p>
<p>UNIT 3 THE CREATIVE THINKING</p>	<ul style="list-style-type: none"> • Review theories about creative thinking • Learn about the importance of creativity in the classroom • Review the creativity elements, components and strategies to promote meaningful learning • Work on the ways to 	<p>Speaking. Discussing about creativity in the classroom Sharing ideas about ways to promote creativity in the classroom Small talks about creativity elements Discussing about creativity in English language teaching Reading. articles about creativity in the classroom Listening watching videos about creative thinking and creativity in the classroom</p>	<p>1. Creative thinking 2. Importance of creativity in the classroom 3. Creativity elements 4. Creativity components 5. Strategies to promote creativity in the classroom</p>		<p>1 week</p>

stimulate creativity on **Writing**, an essay about
students creativity in education

5.2 FEASIBILITY

After having spoken with the authorities of the school, it is possible to carry out this proposal since it has the support of the authorities and teachers, the latter ones are willing to provide all the facilities and invest their time in order to grow professionally, and in the case of the authorities to have a group of teachers more capable to do their work and go on par with the methodological innovations that are appearing every day.

In addition, the practice exercises for teachers has been the subject of interest by the authorities of the school, who have investigated about what happens in the interaction that the teacher sets every day with the students within the classroom.

School authorities are ready to provide the following support:

- Economical support for the materials
- Allow the use of the school classrooms
- Allow the time that English teachers need to attend the course

5.3 IMPACT

The proposal of training teachers in the convergent and divergent thinking is due to the process of innovation that the English language teaching – learning process demands today for teachers to integrate new teaching techniques that ensure that students develop their language skills in the English language which allow them to get better opportunities in their labor field. This proposal will help teachers to get a better conceptual clarity and to identify which activities and techniques will give them better results in the classroom.

The students of the future should be able to solve problems, think critically, think creatively, make decisions, generate new ideas and analyze information, this is why teachers need to incorporate new and innovative techniques to give students more opportunities to live effective learning experiences.

5.4 EVALUATION

The evaluation is part of the whole teaching and learning process, so in this research it plays a very important role because it does not only help to verify the achievement of the objectives of the proposal; but it is also very helpful to determine its effectiveness; the evaluation will consist on situations that must be designed by teachers where they can demonstrate what they have learned about the incorporation of activities of convergent and divergent thinking in the promotion of meaningful learning. The work done by teachers in the course can be appreciated and valued through the evaluation.

This assessment will also serve to suggest and to plan future actions that will be used to improve the English teaching and learning process in this high school.

5.5 PARTICIPANTS AND BENEFICIARIES

The people who participate in this proposal will be the authorities and teachers at the Dr. Francisco Campos Coello high school. The first beneficiaries will be the students, who will have more opportunities to experiment new techniques and learning situations. The convergent and divergent thinking will be essential for them to develop their critical and creative thinking.

The second beneficiaries of this proposal are the teachers, who have the opportunity to develop their pedagogical skills that allow them to incorporate new teaching strategies for not only ensuring that students learn significantly, but for being updated with the changes that occur every day due to globalization and technological developments. Teachers will grow up professionally developing adequate teaching skills and abilities.

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GLOSSARY

Convergent thinking

Convergent thinking is a style of thinking that attempts to consider all the information available to find out a single best possible answer.

It is most effective when an answer already exists and simply needs to be recalled or worked out through decision making strategies.

Divergent thinking

Thought process or method used to generate many creative ideas by exploring many possible solutions by applying techniques as: brainstorming, free writing, creative thinking.

The language acquisition

It is the cognitive process of acquiring skill or knowledge: "the child's acquisition of language" Although how children learn to speak is not perfectly understood, most explanations involve both the observation that children copy what they hear and the inference that human beings have a natural aptitude for understanding grammar. While children usually learn the sounds and vocabulary of their native language through imitation, grammar is seldom taught to them explicitly; that they nonetheless rapidly acquire the ability to speak grammatically supports the theory advanced by scientists.

Classroom dynamics

Classroom dynamics refers to the interaction between students and teachers in a classroom community. It makes relation to how to set up a positive classroom

atmosphere where students feel comfortable about learning and communicating with other students and with the teacher.

Cooperative learning

Cooperative learning is a form of active learning where students work together to perform specific tasks in a small group.

Creativity

Creativity is defined as the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others. (Human Motivation, 3rd ed., by Robert E. Franken)