

## **The Role of Memory in the English as a Second Language Classroom**

*Julieta Rodegher*<sup>2</sup>

*Universidad Católica Argentina*

✉ rodegherjulieta@gmail.com

Recibido: 30/5/2019

Aprobado: 19/8/2019

### **Abstract**

In the recent years, memory has been frequently disregarded as a tool to learn as it is considered a vehicle that makes students acquire temporary information and deprived of all meaning. However, memory could be the tool that leads to effective, meaningful and consequently permanent learning. Nowadays, research on the brain and its areas in connection with learning has led to consider the benefits of taking these areas into account in the ESL field. The various processes memory provides learners with during each learning episode should be taken into account in order to provide students with a selection of activities according to the way in which these processes occur. The aim of this paper is to analyse how teachers use memory, memory-friendly approaches and activities in the classroom to foster the real role of memory: effective learning.

**Key words:** brain, ESL, secondary school, effective learning, memory, lesson plan, approaches, activities.

### **Resumen**

En años recientes, la memoria ha sido frecuentemente desestimada como una herramienta para aprender ya que es considerada un vehículo que hace que los estudiantes adquieran información temporal y privada de todo significado. Sin embargo, la memoria podría ser la herramienta que conduce a un aprendizaje efectivo, significativo y consecuentemente permanente. Hoy en día, la investigación acerca del cerebro y sus áreas en conexión con el aprendizaje ha llevado a considerar los beneficios de tener en cuenta dichas áreas en el campo de ESL. Los procesos varios que la memoria otorga a quienes aprenden durante cada episodio de aprendizaje deberían ser tomados en cuenta para así proveer a los estudiantes con una

---

<sup>2</sup> Julieta Rodegher is an English professor and Licenciada who worked as an English teacher in both primary and secondary school and is currently working as an English teacher in secondary school and as an adjunct professor of English Language I and II in Teacher Training and Translation courses at Pontificia Universidad Católica Argentina. Email: rodegherjulieta@gmail.com

selección de actividades acorde a la forma en la cual estos procesos ocurren. El objetivo de este trabajo es analizar cómo los maestros usan la memoria, los enfoques y las actividades afines en la clase para promover el verdadero rol de la memoria: el aprendizaje efectivo.

**Palabras clave:** cerebro, ESL, escuela secundaria, aprendizaje efectivo, memoria, planificación, enfoques, actividades.

### **Introduction**

In the recent years, theories on Brain Based Learning have been developed in order to show how learning may be improved by considering the way in which the brain processes information (Jensen, 1998). However, one of the processes of the brain in connection with learning seems to deserve special attention since it is responsible for making learning effective: Memory. Since learning is the process by which individuals acquire new knowledge and skills and memory is the process by which they retain that knowledge and those skills for the future (Sousa, 2011), teachers' knowledge on the subject may enlighten their understanding on how students learn.

Connell (2009) explains that Brain Based Learning may be considered a vehicle to reaching techniques that have arisen thanks to research in neurology and cognitive science. These techniques may be used to enhance teachers' instruction as well as students' ability to learn through ways in which they feel most comfortable because learning occurs according to the way in which the brain naturally learns. Understanding the brain may lead educators to find principles derived from this understanding and to use them as strategies in the classroom (Jensen, 2008).

Understanding how the brain learns derives in understanding how memory operates. Though the use of memory in learning seems quite obvious and linked to every activity teachers conduct in their lessons, it may be surprising to find out how far some activities are from involving memory in the learning process. Consequently, new information is not retained properly and it might be finally lost. The various processes memory provides learners with during each learning episode should be taken into account in order to provide students with a selection of activities according to the way in which these processes work, making retention possible.

Therefore, to understand how learning takes place through these processes, that is to say, how information is acquired, it is necessary to know how this information undergoes a process of

different stages. In the 1980's, Robert Stahl of Arizona State University initially developed a model based on this process and this model was later modified and updated for its current application (Sousa, 2011). The model explains how information is learnt and how memories are formed. Then, if the process through which memory deals with new information is considered, it seems evident that memory may become the tool to be taken into account to comprehend how new information is dealt with and what is applied in every learning episode of any type.

The use of memory could be activated through lesson plans and activities designed and selected according to the way in which memory works in favour of the learning process and the storage of new information. In order to do so, lesson plans should take timing, activity shifting and distributed practice into account, as well as the type of activities provided according to different types of intelligences, taxonomies and emotions in order to foster and improve the way in which students use their memory to learn. All these aspects influence the way in which memory works as they act as a net to make memory work efficiently.

Nonetheless, no matter how varied the methods educators apply may be, results may not probably change because most tend to be based on memorising. In fact, though memorisation is disesteemed, the aim of traditional education models seems to be to assess the memory processes implied in that path. Then, the problem may rely on how education focuses on memorising as an aim and not as a tool to reach meaningful learning.

Although Brain Based Learning and the ways in which memory operates to make learning effective may be studied in a wide range of subjects, and since it is very disappointing for teachers to see how ESL secondary students fail to remember grammar structures or vocabulary covered in previous units or to apply them to other activities in a different context, this paper will focus on traditional English as a Second Language (ESL) lessons and activities in secondary school and on how activities may be adapted to theories related to memory and learning. Proper knowledge on these issues may allow ESL secondary school teachers to find strategies which foster the use of memory in order to achieve effective and meaningful learning through retention. Considering some of these ideas seems to suggest that ESL teachers should revise how they organize their classes to get efficient results, or, in other words, how they design and plan their lessons including activities in order to empower the role of memory.

Therefore, it is the aim of this paper to analyse the extent to which the lesson plans, activities and strategies applied by ESL secondary teachers in schools in the city of Buenos Aires are

chosen making the best use of the theories and techniques that foster the real role of memory, that is, effective learning.

### **Memory-friendly approaches in the ESL lesson plan**

Teachers design lesson plans based on instructional technologies and apply them to their lessons according to their experience (Sousa, 2011). However, those technologies do not seem to be the tools teachers mainly use to organise and design their lessons in secondary school. Instead, lecturing is the main method of instruction while, not surprisingly, students present an increased novelty-seeking behaviour.

Achieving meaningful learning implies making the way teachers teach match both the ways in which memory works and its paths to make learning effective. By implementing a memory-friendly lesson plan, teachers may use memory paths to help students retain and recall what they are taught through a right choice of activities based on memory-friendly theories and help them reach meaningful learning. Reinforcing this idea, Connell (2009) explains that teachers should design their lesson plans taking into account aspects based on the way in which memory operates and which helps information to move through memory's paths properly.

### **The PPP model and the role of memory**

One of the traditional lesson plan models in ESL teaching is the *PPP model*, which stands for *Presentation, Practice* and *Performance*, due to its characteristic regarding the introduction of a topic and language in a contextualized manner. Harmer (2008) explains that through this method of lesson plan design, the teacher introduces the language to be taught in a contextualized situation, in order to generate meaning. As finding meaning will make learning effective because it allows memory to establish more connections, this paper will consider this approach in order to analyse activities in traditional English as a Second Language classes through a memory-friendly lesson plan design. Indeed, it might be said that there is a parallel between how the *PPP* approach presents a topic and makes it move through each of its steps, and the way in which memory receives that topic and makes it move towards the long-term memory, as both paths search for meaning. What is more, the Primacy-Recency effect (Sousa, 2011) seems to match the stages in a *PPP* lesson plan.

The effect known as Primacy-Recency (Sousa, 2011) describes how during a 40-minute-learning episode, learners tend to remember best that which comes first, secondly that which

comes last and least that which comes in the middle. Consequently, it is possible to believe that if new topics or revision of previously taught topics occur in the middle of the class, information will not be easily remembered afterwards. On the contrary, information received at the very start of the class, for example, through Warm-up activities, and the last part, for instance, through Closure activities, may stand a better chance since information is likely to be remembered. Following this idea, the beginning of the class may become the most important moment because it will lead students to remember information more effectively.

From the very beginning of the class, during the *Presentation* step, students apply both types of short-term memory: immediate and working memory. When the teacher starts the lesson through *Warm-up* activities, students receive information through the immediate memory and then it moves on quickly to be dealt with in the working memory in order to retain the information students need to follow those activities and apply it accordingly. Later, teachers tend to present a new topic during the *Teaching phase*. Even though information is presented in a contextualized way, as short-term memory presents time limits, it is at this stage that some of that information seems to get lost. Therefore, timing and certain moments of the class are important elements to consider since students' focus and attention need to be kept high.

### **Memory friendly approaches and activities in the lesson plan**

Manes and Niro (2015) explain that attentional resources are directed towards something specific in a certain moment and that specific something is what is perceived in a conscious way. Moreover, Lombardi (2008) explains that activity shifting or changing activities two to three times during a class, as well as considering different learning styles stimulate thought and action. In order to do so, it is necessary to change the way in which learners deal with new items presented by organizing activities into meaningful parts, placing ideas in context, creating the right atmosphere and infusing a range of learning styles into classroom practice. Therefore, this paper will focus on activities that match memory-friendly approaches such as Gardner's Multiple Intelligences, Bloom's taxonomy and emotions in learning.

In the *Presentation* step, the consideration of a wide variety of intelligences is extremely important since they help keep attention high and accompany the reception of information, helping memory in this task. The inclusion and participation of all students, and the selection of activities according to the different learning styles in the classroom would collaborate to create an atmosphere to enhance positive emotions to make each student feel comfortable

during the class. Besides, considering multiple intelligences opens the door to help memory receive information in a way that also responds to students' needs.

Some considerations to apply the Primacy-Recency (Sousa, 2011) concept in the classroom include teaching new material first during Prime-time-1, allowing students to practise during Down-time, and doing closure during Prime-time-2. According to this concept, whatever the topic introduced is, it should be conducted at the beginning of the class, right after the *Warm-up*, to make effective use of that time.

The consideration of this last point in connection with timing may suggest that *Practice* should follow during the Down-time period in order to provide learners with enough time to use new information in the working memory. During this part of the lesson, learners should be required to do exercises to check if they remember what was explained before. Therefore, in this step the *Remembering* category in Bloom's taxonomy should be taken into account to provide students with the right selection of activities. During this step of the class, the repetitive use of the topic through a variety of activities allows memory to create patterns and therefore, to establish connections forming new memories. As practice becomes more frequent, connections and memories are formed, since according to Sousa (2011) repetitions make connections stronger. What is more, Willis (2008) states that networks become stronger if they are promoted with practice.

Finally, in the *Production* phase, in which it might be inferred Prime-time-2 occurs, students should be asked to apply information to a new context where their own creation is implied (Harmer, 2001). So, they are able to transfer their new knowledge to new created contexts, which guides them to connect what they have learnt with their personal experience and thus, to a real context. This is the point when memory-friendly approaches converge, since new contexts are required when applying Bloom's taxonomy or a variety of activities according to different intelligences, and emotions allow students to connect all of these with their personal experiences. It might be concluded that the combination of the three of them empowers the results of students' activities making learning occur, since they all walk in the same direction and towards the same objective: meaningful learning. Consequently, students find sense and meaning in learning the topic, and it is in this way that new information begins its path towards the stage of the long-term memory (Sousa, 2011).

Nevertheless, students are frequently asked to do activities in the *Practice* phase during Prime-time-2. So, what tends to be best remembered are those exercises which help to memorize instead of those which help to find meaning and establish connections with

personal experiences to find the topic meaningful. Learners remember drills rather than critical thinking exercises.

As the last part of the lesson tends to be best remembered, it is relevant to use this time in a very effective way to avoid wasting it. According to Nickelsen (2004), activities such as comparing and contrasting as well as metaphors, similes and analogies, are really important for memory since they provide meaning. Therefore, activities for this step should be selected carefully in order to provide students with the information the teacher wants them to retain in a meaningful way. The right choice of tasks according to Bloom's pyramid and a wise selection of activities that respond to the intelligences presented in the classroom will help to make them meaningful.

Towards the end of the class, students should be capable of doing different activities, applying knowledge to determine if that learning has been consolidated or not during the *Production* phase, in Prime-time-2. Therefore, since knowledge produced in this stage will most likely be the second best remembered (Sousa, 2011), students will recall activities that are meaningful (rather than activities such as drillings that help them remember to keep on using that information) and to transfer it to other contexts.

As regards emotions, as a general principle, according to Christianson (2014), those events which are associated with strong emotional reactions tend to be learned well, and even more when the reaction is even stronger. For highly affective material, that is, material which evokes either positive or negative emotions, there is wide memory advantage. There are benefits for memories of strong emotional reactions. Christianson (2014) states that a strong determinant of memory for an event is how much emotion it has originally aroused, either a pleasant or unpleasant experience. He indicates that an event's memorability also depends on its infrequency and uniqueness, because routine events are quickly and easily forgotten.

Moreover, task enjoyment directs attention towards the task, thus allowing students to make full use of cognitive resources. Pekrun (2014) explains that emotions such as enjoyment, hope and pride should foster learners' self regulation of learning.

Ballarini (2015) states that one of the dimensions of stimulus appraisal is novelty since whenever something unexpected happens in the lesson it will be mostly remembered.

Nonetheless, considering emotions in the ESL secondary school classroom is not explicit. On the contrary, emotions are key elements that underlie every activity and interaction in the classroom. Making sure they are being promoted correctly, especially with teenagers, may guarantee meaningful learning.

Therefore, teachers should consider the type of emotions and atmosphere that their choice of activities will set. To start with, *Warm-up* activities set the atmosphere in the classroom to learn. Making students participate and feel involved with their teacher and classmates will help them feel comfortable from the very beginning. Evaluation periods should also be considered as key moments to work on creating a good learning atmosphere, as they usually differ quite a lot from everyday lessons.

### **Timing and recollection**

Activities in the *Production* phase constitute opportunities to transfer new knowledge but so do exams since information has to be recalled. According to De Brigard (2011), the effect of temporal distribution between study and recall of information during the learning process, that is to say, the time between studying material and the first exam, is extremely relevant to determine the effect of the test as a tool to learn. The period between the last presentation of the material or topic and the final exam may influence the obtained results. Sometimes, the exposure to material does not seem to be sufficient but it is important to consider the temporal distributions between the time devoted to study and the exams, and the different types of information to be assessed. This might suggest that studying the previous night provides good results regarding marks, but information might not be retained or applied to a new context.

Once a topic has been presented, practised and applied to a new context, it is necessary to recycle the topic constantly. Nevertheless, it is very disappointing for teachers to see how students fail to remember and apply what has been learned before to other activities in a different context and how results are not exactly those they expected. The reason for this seems to be connected to the way in which that new topic was stored. Zandi and Toughmalani (2011) explain that some of the information transferred from the short-term to the long-term memory is lost. So, review of the information in the learning process, that is to say, recycling within a period of 24 hours is completely necessary to allow the long-term memory to work properly.

Therefore, for information to be recalled afterwards it is necessary to reach correct storage, and it is logical to see that no recycling is possible if learners cannot recall what they have learned before. According to Sousa (2011), recalling occurs when information is retrieved from long-term storage sites, and then consolidated and decoded back into working memory, which implies relearning. Thus, activities such as project assignments are useful to make

recalling necessary, that is to say, going back to previous topics and applying them while working on the long-term project.

As recycling is a key tool to allow both teachers and students to obtain continuity and coherence in lessons, it seems necessary to reinforce it in order to improve storage. If students are able to recall learning after a 24-hour-period, retention has occurred (Sousa, 2011). As daily lessons require constant recycling, this factor may be easily checked at the beginning of each lesson. If information cannot be recalled, future activities should be chosen to make students start the whole storage process again, until information can be recalled properly. Nickelsen (2004) points out that in order to do so, students should be given a test or a quiz 24 hours later. If they score well, information was probably understood and they stored information in the long-term memory.

Therefore, the types of activities to be included in the design of each lesson plan should be carefully considered and should include tasks and tests that match the requirements that will probably lead to a meaningful class. Moreover, it is also important to vary activities in order to keep attention high, and to allow students to perform at their best.

Multiple intelligences provide a number of activities to consider when planning lessons ahead. Students are a wonderful combination of different ones and it is a true challenge for ESL secondary school teachers to discover them. Moreover, the consideration of multiple intelligences allows ESL secondary school teachers to select them for each step in the *PPP* lesson plan, as they may be applied either in the *Presentation*, *Practice* or *Performance* phase to design activities.

Typically, when the *Warm-up* phase finishes, the teacher presents the new topic or the topic to be recycled in that ESL lesson. Consequently, students will be handling information through their working memory, and this is the information that must be stored in that lesson to recall it afterwards.

Consequently, the *Practice* phase should offer tasks to start a path towards critical thinking, or in other words, meaning, to help information move through the next steps in the path of the short-term memory towards the long-term memory considering the taxonomies in Bloom's pyramid. Therefore, as the aim of achieving a meaningful lesson is to help memory operate, a parallel between the path memory follows towards discovering meaning and the path of Blooms' pyramid towards critical thinking could be drawn to find activities that match both of them, as both move in the search of meaning.

### **Memory vs. Memorizing**

Nowadays, many positions are the result of the rejection towards teaching strategies based on memoristic learning or to those which do not promote any real comprehension of topics. When discussing meaningful learning, which pursues the deep comprehension of the content to be learned, the type of learning which requires practice or memorization is negatively valued, as if it troubled the achievement of meaningful learning, or if it had to be replaced for more complex processes. Consequently, the Practice phase might become weak as *Remembering* tasks are not valued enough. However, the obvious warning is not to confuse simple components of a learning activity with the broader unit that contains them and provides meaning to them.

In the *Practice* phase, ESL secondary school students handle information through the working memory. That information will move later to the long-term memory. Therefore, activities provided at this point should help them to reach this aim. According to Bloom's pyramid, the *Remembering* and *Understanding* categories provide teachers with activities that help students fix what they are learning. Then, if the basis of the pyramid is not strong, the path towards critical thinking categories will not be reached. That is to say, the path towards meaning and the long-term memory, or in other words, to effective learning, is also unlikely to be started.

In fact, practice before exams is another important point. The first aspect to consider is the previous period known as revision time, which is the time when students look at what they want to learn. The problem is that the ability to recognise something differs from the ability to recall it. Revision implies simply recognition of information, there is something familiar and the feeling is of complete knowledge. But what learners actually need at exams is to recall relevant information and to use it to answer questions.

Another interesting point regarding previous study for tests is the time required to practise. Carey (2015) points out that through spaced study, the students need to search for information, bring it back to mind and restore it, as it is a technique which results efficient because it allows students who apply it to remember up to two times more in a test in a week compared to learning the material in one night only.

In the *Production* phase, information starts to move to the long-term memory. Activities at this point, following Bloom's pyramid, are those which correspond to the categories of *Applying*, *Analysing*, *Evaluating* and *Creating*. These collaborate to make *transference* occur

as well (Sheese and Lipina, 2011). Therefore, sense and meaning are acquired and effective learning takes place.

### **The Study**

This study was conducted in order to determine the extent to which ESL secondary school teachers in the city of Buenos Aires and Greater Buenos Aires immerse students in lessons which lead them to use their memory effectively to learn. It also seeks to unveil how these school teachers plan their lessons, some of the reasons behind their choices and the activities they most frequently use.

Therefore, this paper will analyse, firstly, the results obtained in a survey conducted among ESL secondary schools teachers from private schools, and secondly, the observations of some classes in those schools offering both a quantitative as well as qualitative approach to the data collection process.

The self-administered questionnaire consisted of a varied range of questions that provide relevant information about ESL teachers' age, the year in secondary school in which they currently teach ESL, information about lesson plan designs according to *PPP*, timing considerations and memory-friendly methodologies considered in this paper.

Nevertheless, this instrument pretended to be a starting point of research concerning the role of memory in the ESL secondary school class. The aim of the survey was to provide information concerning how ESL teachers design, plan and conduct their classes in secondary school, and according to the results obtained through the questions, to determine whether they apply memory-friendly theories and consequently, if they make effective use of the role of memory in the ESL secondary school class. The aim of the observations was to obtain information about real ESL teachers' practice considering the activities they choose, how they manage time during a lesson and about classroom atmosphere.

Thus, the self-administered questionnaire consisted of two parts. Part one of the questionnaire contained 2 questions designed to obtain information about the characteristics of ESL secondary school teachers concerning their age and practice. These questions were designed to elicit personal information such as age and the classes they taught as well as to frame respondents' subsequent answers.

From then on, part two was divided in two groups to ease analysis: The first set, questions 3 to 10, focused on lesson plan design (*PPP*), and the second set, questions 11 to 16, were

questions related to activities to detect through them the memory-friendly approaches frequently used by these teachers.

The design and purpose of the first part of the class and activities selected coincided with what is expected according to a *PPP* lesson plan design that supports the starting steps through which memory operates. The short-term memory receives information, the topic is either introduced or revised (inducing recalling and determining if it is necessary to restart the process), attention is kept high through an interesting choice of activities and consequently, positive emotions should be fostered in the classroom. Besides, this step occurs during Prime-time-1 and will be mostly remembered (Sousa, 2011).

Questions 6, 7 and 8 corresponded specifically to the *Teaching* phase and its organization. According to the responses in question 6, the first tendency was to organise the class revising (12 out of 18) and practising (7 out of 18) a previously taught topic. The second tendency showed that 8 out of 18 teachers organize the class revising and practising a previously taught topic but also introducing (2 out of 18) and practising a new one (1 out of 18). Then, teachers indicated that they were inclined to present a new topic (12 out of 18), to provide activities to practise this topic (6 out of 18), and to devote time to practise a previous topic (2 out of 18). The last option corresponded to the practice of a new topic (16 out of 18), followed by revision (1 out of 18) and practice of a previous topic (2 out of 18). It may be inferred through the results obtained according to the first group of answers that teachers use more than a class to teach a certain topic, which is highly positive since practice reinforces links and the more practice learners have, the more connections are established in their minds (Willis, 2008; Sousa, 2011).

All in all, results seem to indicate that though ESL secondary school teachers do choose a wide range of activities in order to provide their students with a wider framework of opportunities through windows of intelligences during the *PPP* stages, they do not seem to offer the same variety when assessing them. Probably quite unfair, since students learn in a context different from the one they deal with when being assessed.

Last but not least, tests are designed in a friendly way for a reduced group of intelligences. There seems to be a mismatch between daily activities and assessing, though in fact both should lead to meaningful learning. Daily practice activities lead learners to use their memory effectively by using a wide range of intelligences and abilities implied. However, according to the findings, this does not occur when testing them.

Results suggested that ESL secondary school teachers follow a lesson plan according to the steps in the *PPP* design, which means that they accompany, in this sense, the way in which memory operates. However, as regards the Primacy-Recency effect (Sousa, 2011) the *Teaching phase* occurs during Down-time and *Practice* occurs until the end of the class. Therefore, the new topic tends to be presented in the period when information is less remembered and students work on activities that help them remember but which do not contribute to find meaning.

Researchers in Second Language Acquisition (Juffs, 2006) explain that the short-term memory is an on-line capacity for processing and analysing new information (words, grammatical structures, etc). Thus, the fact that most teachers start their classes through a *Warm-Up* section, while information is received through the short-term memory, reinforces its capacity.

When revising a previously taught topic, as most teachers explained they do, students are not only recalling previous knowledge (while simultaneously bringing it back from the long-term memory and therefore, checking they have learnt the topic well), but also having the opportunity of starting the cycle all over again if they have not. If the former is the case, teachers may go on with the *Teaching* phase and start a new topic. If the latter occurs, they might explain the same topic again. Nickelsen (2004) explains that reviewing information within 24 hours helps to increase retention. He indicates that the degree of recollection increases after each review session, as reviewing helps neural connections become stronger, so more information can be retrieved and less forgotten. Teachers will want students to revisit language forms they have already taught in many stages, as part of an overt correction stage or a straightforward revision process to recycle language forms from time to time to help them remember in a better way (Harmer, 2001). As according to results teachers do not assess students on the same day or even the same week, more time is devoted to revise the topic and more connections can be established.

As regards Bloom's taxonomies, the findings suggested that teachers tend to follow the categories in the pyramid towards critical thinking and meaningful learning mainly in daily practice activities. Results showed that ESL secondary school teachers provide a wide range of activities for daily practice, that is to say, from *Remembering* to *Creating*, and consequently students move towards critical thinking and they may probably find meaning in what they are learning. According to Caine and Caine (1991), if programming and memorization is all that is required, there is surface knowledge only. Yet, meaningful

learning is creative, and it occurs by fostering patterns and connections students matter. This sense of interconnectedness becomes clear when emotions and cognition come together. However, it seems that ESL teachers tend to select activities that mainly focus on the *Remembering*, *Understanding* and *Applying* stages, which would be advisable at the beginning of the class. Thus, it would be necessary to see how they keep moving towards meaningful learning through activities that match higher categories in the pyramid.

The same case seems to be that of multiple intelligences, as according to results teachers tend to foster the use of different intelligences in the classroom. However, they do so mainly in daily practice. Therefore, it could be inferred that the results reveal a mismatch between the way in which students deal with the topic in everyday lessons and the way they do so in tests. According to the findings, activities such as dramatizing or role plays, singing activities and listening exercises and group assignments are chosen for daily practice. Arnold and Fonseca (2009) affirm that providing a variety of language activities that stimulate intelligences makes it possible to engage multiple memory pathways necessary to produce sustained deep learning. Thus, tests might not be instances to foster meaningful learning as teachers do not include activities which represent a variety of intelligences. The answers also showed that ESL teachers tend to be quite traditional in their choices as they choose activities which involve mainly the *Linguistic* intelligence. Even those which are less frequently chosen correlate with the *Linguistic* intelligence, with the exception of role plays or dramatizing.

What is more, results indicated that this variety of activities is not considered when assessing students. Thus, emotions originated in assessment periods might be quite different from those which characterize everyday lessons. Bloom's taxonomies from *Analysing* upwards are not taken into account to assess students. The same occurs in the case of Multiple Intelligences, as the *Linguistic* Intelligence prevails in tests, as well as the *Interpersonal* Intelligence through group assignments. Neither of the approaches seems to be considered as a valuable tool to assess students. Although daily practice activities accompany memory paths to make learning effective, this does not occur when testing students. Lord and Baviskar (2007) explain that this occurs because teachers stress the factual content of what is being taught to students. Consequently, most of the questions on the tests belong to the knowledge and comprehension levels of the taxonomy.

However, multiple-choice questions can be written for the *Analysis* and *Evaluation* categories. At the *Analysis* level, students could be asked to select the least important incidence from a list of occurrences. However, along with creating more challenging test

items, teachers should challenge the way students think during class to help students discover information through inquiry. If students are used to being challenged during the lessons, they will have less problems in upper-level questions in Bloom's hierarchy. Therefore, teachers need to teach the way they test and the finding indicate that this is not the case.

This last point becomes an interesting one to analyse and it raises many questions. Why are teachers reluctant to select these activities as part of tests? Is it a clear indicator that they assess in traditional ways and considering only selected groups which fit those ways? Does the choice have to do with correction benefits? Does the institution demand tests of this kind? Clearly, further research focused only on evaluation and assessment should be required to find answers to these questions. According to Ozden and Gultekin (2008), the context, the emotions, the physical environment, the process and the organization are the five components of a reliable evaluation in brain-based learning. They explain that these areas involve mental, physical and emotional processes and do not involve the traditional evaluation activities at the end of each unit, as evaluation should be ongoing and cumulative, through activities which intend to figure out the interests and the weak and strong learning styles of the students.

Another point to consider in connection with tests is the period when teachers choose to test students. According to results, they do so after a week, which is positive for the storage of information because a longer period of practice is provided. Therefore, there is more repetition and the search for meaning goes on. Given a longer period of time, taxon memories interact with locale memories better, to make the interaction between them provide meaning (Caine and Caine, 1991).

Going back to the concepts related to recall, though results show that teachers try to make students recall information from the long-term memory through *Warm-Up* activities or revision of previously taught topics, they do not tend to do it in longer periods of times, that is, by asking students to work on projects that imply revising previous topics. Nickelsen (2004) explains that in order to ensure that information is received and encoded accurately and meaningfully, information should be presented in different manners according to different learning styles to provide opportunities for students to make the information meaningful for themselves. This suggests that activating students' prior knowledge by connecting the new information with something they already know is important.

All in all, results from both surveys and observations may set the starting point for future research. Further research could help to inform teachers and their practices to aid students in

the achievement of meaningful learning in the context of ESL lessons. Moreover, results could be the basis for future research concerning assessment criteria and consideration of memory operations in this aspect. It could be focused on the extent to which activities in the lesson plan, which are daily applied and follow memory-friendly methods, match those in tests. Specially when the findings correlate with what was observed, that is, classes in which ESL teachers search for meaningful learning fostering the right use of memory, in order to see if this objective remains in longer periods of time (reinforcing practice), and matches the aim of tests.

### **Conclusion**

Caine and Caine (1991) explain that the word memory is usually associated with the recall of specific dates, facts or sets of instructions, while the ability to recall bits of information acquired daily is forgotten. In this sense, it seems that in the recent years, memory has been frequently disregarded as a tool to learn. Nowadays, it is believed to be a vehicle that leads students to acquire information temporarily, and deprived of all meaning. Ironically, memory operates exactly in the opposite way as it is the tool that makes learning effective, meaningful and consequently permanent (Sousa, 2011). This tendency could have been originated in the misuse of memorization and memory as synonyms.

The memory system is the one in charge of dealing with new information, and teachers are in charge of designing how students receive that information at school. Therefore, activities selected should support memory paths. The information moves through each step in memory processes, as information moves through activities provided in the classroom and in each lesson plan. This information, that is, the content of ESL lessons, should be meaningful in order to help information reach its final stop, the long-term memory, and consequently, to be recalled when needed to use it in the future and to apply it in different situations.

Concerning the results obtained in the survey and the observations conducted which this paper has considered, it can be said that ESL secondary school teachers follow a lesson plan based on the *PPP* design. Consequently, it might be added that they accompany memory operations. Nevertheless, they do not seem to handle time considering the stages the Primacy-Recency effect (Sousa, 2011) suggests.

Teachers declared in the surveys to revise previous topics in each class. As a consequence, students recall previous knowledge bringing it back from the long-term memory and teachers

have the opportunity to start the cycle all over again if students are not able to recall what they need.

As regards Bloom's taxonomies, the findings showed that teachers follow the categories in the pyramid towards critical thinking and meaningful learning mainly in daily practice activities. In the same way, they do include a variety of intelligences in daily practice. However, ESL teachers do not appear to consider neither taxonomies nor intelligences when designing tests, which might be a starting point for further research on the subject. Through the responses, it may be inferred that teachers foster positive emotions in their lessons, generating a relaxed atmosphere to focus attention and to enjoy the learning process.

Sharing knowledge on this subject may result in effective changes in traditional ESL secondary school lessons, not only in the way educators teach but also on the way in which students learn, and the results obtained. It would be of extreme interest to conduct further research on this matter and to analyse registers of obtained results after each lesson or after determined periods of time, to observe how learning processes extend in time. Connell (2009), suggests including Brain Based Learning in graduate and undergraduate programs that train teachers, in order to combine neuroscience research with teaching strategies.

ESL secondary school teachers' wish is to make every lesson count, which is not an easy task. Teenagers need to be engaged in their learning process, and to be highly motivated to have a reason to learn. If meaning is discovered in each part of the English lesson, and activities are seen as a whole that will provide them with a sense for learning, teenagers should be eager to learn or at least to consider learning the English language with a purpose which is not only passing exams. The meaningful learning context should be created through activities that take into account tasks which lead students to think critically, which help students to make use of their skills by firing the use of a variety of intelligences, and which make positive emotions match the learning process. This, together with steps of a lesson plan that will simultaneously accompany the path that memory follows to deal with information from the very beginning, stands the best chances to become effective and memorable learning.

#### **References**

Arnold, J. and Fonseca, M. C. (2009). Multiple intelligence theory and foreign language learning: A brain-based perspective. *International journal of English studies*, 4(1), 119-136. Retrieved from: <http://revistas.um.es/ijes/article/view/48141/46121>

- Ballarini, F. M. (2015). *REC: Por qué recordamos lo que recordamos y olvidamos lo que olvidamos*. Buenos Aires: Sudamericana.
- Caine, R. N., and Caine, G. (1991). *Making connections: Teaching and the human brain*. Alexandria, Virginia: Association for Supervision and Curriculum Development
- Carey B. (2015). Brain Science for Beginners. *Education and the Brain*, 75(1), 88-91. Independent school. Retrieved from: <http://connection.ebscohost.com/c/articles/109986391/brain-science-beginners>
- Christianson, S. A. (2014). *The handbook of emotion and memory: Research and theory*. London/New York: Psychology Press.
- Connell, J. D. (2009). The global aspects of brain-based learning. *Educational Horizons*, 88(1), 28-39. Retrieved from: [http://www.jstor.org/stable/42923784?seq=1#page\\_scan\\_tab\\_contents](http://www.jstor.org/stable/42923784?seq=1#page_scan_tab_contents)
- De Brigard, F. (2011). Memoria, neurociencia y educación. *La pizarra de Babel: puentes entre neurociencia, psicología y educación* (pp.179-194). Buenos Aires: Libros del Zorzal.
- Harmer, J. (2001). *The practice of English language teaching*. London/New York: Longman.
- Harmer, J. (2008). How to teach English. *ELT journal*, 62(3), 313-316. Retrieved from: <https://academic.oup.com/eltj/article-abstract/62/3/313/384919>
- Jensen, E. (1998). *Teaching with the brain in mind*. Alexandria, Virginia: Association for Supervision and Curriculum Development.
- Jensen, E. P. (2008). A fresh look at brain-based education. *Phi Delta Kappan*, 89(6), 408-417. Retrieved from : <http://journals.sagepub.com/doi/abs/10.1177/003172170808900605?journalCode=pdka>
- Juffs, A. (2006). Working memory, second language acquisition and low-educated second language and literacy learners. *LOT Occasional Series*, 6, 89-104. Retrieved from: <https://dspace.library.uu.nl/handle/1874/296562>
- Lombardi, J. (2008). Beyond Learning Styles: Brain-Based Research and English Language Learners. *Clearing House*, 81(5), 219-222. Retrieved from: <https://www.tandfonline.com/doi/abs/10.3200/TCHS.81.5.219-222>
- Lord, T. and Baviskar, S. (2007). Moving students from information recitation to information understanding: exploiting Bloom's taxonomy in creating science questions. *Journal of College Science Teaching*, 36(5), 40-44. Retrieved from: <https://search.proquest.com/openview/dd6a1a8ec40b82f0aa26a8ac5f970726/1?pq-origsite=gscholar&cbl=49226>
- Manes, F. and Niro, M. (2015). *Usar el cerebro. Conocer Nuestra Mente para Vivir Mejor*. Ciudad Autónoma de Buenos Aires (CABA): Planeta.
- Nickelsen, L. (2004). *Memorizing Strategies & Other Brain-based Activities that Help Kids Learn, Review, and Recall*. New York: Scholastic Teaching Resources.
- Ozden, M., and Gultekin, M. (2008). The effects of brain-based learning on academic achievement and retention of knowledge in science course. *Electronic Journal of Science Education*, 12(1), 1-17. Retrieved from: [www.ejse.southwestern.edu](http://www.ejse.southwestern.edu)
- Pekrun, R. (2014). *Emotions and Learning*. UNESCO International Bureau of Education. Retrieved from: <http://citeseerx.ist.psu.edu/viewdoc/>

- Sheese, B. and Lipina, S. J. (2011). Funciones ejecutivas: consideraciones sobre su evaluación y el diseño de intervenciones orientadas a optimizarlas. *La pizarra de Babel: puentes entre neurociencia, psicología y educación* (pp. 229-242). Buenos Aires: Libros del Zorzal.
- Sousa, D. A. (2011). *How the brain learns: A Classroom Teacher's Guide*. California: Corwin Press.
- Willis, J. (2008). Building a bridge from neuroscience to the classroom. *Phi Delta Kappan*, 89(6), 424-427. Retrieved from: <http://journals.sagepub.com/doi/abs/10.1177/003172170808900608?journalCode=pdka>
- Zandi, M. and Touthmalani, R. (2011). The Human Brain, Entropy and Language Learning. *Australian Journal of Basic and Applied Sciences*, 5(8), 939-943. Retrieved from: [https://www.researchgate.net/publication/288778979\\_The\\_human\\_brain\\_entropy\\_and\\_language\\_learning](https://www.researchgate.net/publication/288778979_The_human_brain_entropy_and_language_learning)

## APPENDIX 1

### Surveys in Spanish

#### Actividades y estrategias ESL

Estimado profesor:

Me dirijo a Uds. para pedirles su colaboración en la elaboración de la siguiente encuesta sobre actividades y estrategias.

Por favor una vez completada la encuesta simplemente oprima enviar.

MUCHAS GRACIAS

Saludos

#### \*Obligatorio

Dirección de correo electrónico \*

Tu dirección de correo electrónico

1. ¿Qué edad tiene? \*

- 20 a 30 años
- 31 a 40 años
- 41 a 50 años
- Más de 50 años

2. ¿En qué año del nivel secundario enseña? Por favor referirse a ese año al contestar las preguntas que siguen. \*

- Primero
- Segundo
- Tercero
- Cuarto
- Quinto

3. ¿Usted comienza su clase por medio de una sección de Warm-up? Si la respuesta es afirmativa, por favor siga con las preguntas siguientes. De lo contrario, siga con la pregunta número 6. \*

- Sí
- No

4. ¿Qué incluye en esta sección? \*

- Tema explicado la clase anterior

Introducción a tema nuevo

Otro:

5. A- ¿Qué actividades utiliza en la sección de Warm-up? (Indique todas las que considere de uso más frecuente) \*

Brainstorming

Canciones

Videos

Juegos

Otro:

5. B- ¿Cuánto tiempo dedica usted a esta parte de la clase? \*

10 a 15 min

15 a 25 min

Más de 25 min

6. ¿Cómo organiza usted su clase considerando las siguientes opciones? \*

	Práctica del tema anterior	Revisión del tema anterior	Práctica específica del tema nuevo	Presentación de un tema nuevo
primera	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
segunda	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
tercera	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
última	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. ¿En qué momento de la clase enseña usted un tema nuevo? \*

Principio

Medio

Final

8. A ¿Cómo realiza usted la presentación de un nuevo tema? \*

Exposición oral

Exposición oral y uso del pizarrón

Otro:

8. B ¿Cuánto tiempo dedica usted a esta parte de la clase? \*

5 a 10 min

10 a 15

Más de 15 min

Otro:

9. ¿En qué momento brinda a los alumnos práctica específica del tema nuevo presentado en la clase? \*

Principio

Medio

Final

Otro:

¿Cuánto tiempo dedica usted a la práctica del tema nuevo presentado? \*

10 a 15 min

15 a 25 min

Más de 25 min

Otro:

10. ¿Cuándo evalúa a los alumnos luego de explicar un tema nuevo? \*

Mismo día

Misma semana

La semana posterior o en adelante

Otro:

11. ¿Qué palabras considera usted que utiliza con más frecuencia cuando explica las consignas a sus alumnos en actividades diarias y en evaluaciones? Marque con una X.

	Actividades diarias	Evaluaciones
Fila 1	<input type="checkbox"/>	<input type="checkbox"/>
¿Cómo definirían...?	<input type="checkbox"/>	<input type="checkbox"/>
¿Qué les parece que quiere decir...?	<input type="checkbox"/>	<input type="checkbox"/>
Den ejemplos de...	<input type="checkbox"/>	<input type="checkbox"/>
Ordenen los siguientes...	<input type="checkbox"/>	<input type="checkbox"/>
Resuman lo que hemos visto...	<input type="checkbox"/>	<input type="checkbox"/>
Comparen lo que han visto con.../ Cuáles son las similitudes entre...	<input type="checkbox"/>	<input type="checkbox"/>
Escribe o cuenta en tus propias palabras...	<input type="checkbox"/>	<input type="checkbox"/>
Si no conoces la palabra, dila con otras palabras...	<input type="checkbox"/>	<input type="checkbox"/>
Haz de cuenta que eres...	<input type="checkbox"/>	<input type="checkbox"/>

Encuentra la respuesta de...	<input type="checkbox"/>	<input type="checkbox"/>
Dibuja...	<input type="checkbox"/>	<input type="checkbox"/>
¿Cuáles son las diferencias entre...?	<input type="checkbox"/>	<input type="checkbox"/>
Qué opinas sobre X y en qué basas tus opiniones...	<input type="checkbox"/>	<input type="checkbox"/>
¿Cuáles de los siguientes consideras es el correcto?	<input type="checkbox"/>	<input type="checkbox"/>
¿Qué le preguntarías...?	<input type="checkbox"/>	<input type="checkbox"/>
¿Cómo harías para hacer ....?	<input type="checkbox"/>	<input type="checkbox"/>
Ordena los siguientes ítems...	<input type="checkbox"/>	<input type="checkbox"/>

12. ¿Qué tipo de actividades elige con mayor frecuencia entre las siguientes para actividades de práctica diaria de un tema y para las evaluaciones?

	Práctica diaria	Evaluación
Fila 1	<input type="checkbox"/>	<input type="checkbox"/>
Presentaciones orales/Retelling	<input type="checkbox"/>	<input type="checkbox"/>
Debates	<input type="checkbox"/>	<input type="checkbox"/>
Lectura en voz alta	<input type="checkbox"/>	<input type="checkbox"/>
Dramatizar	<input type="checkbox"/>	<input type="checkbox"/>
Elaborar un libro de cuento	<input type="checkbox"/>	<input type="checkbox"/>
Búsqueda de información	<input type="checkbox"/>	<input type="checkbox"/>
Listening	<input type="checkbox"/>	<input type="checkbox"/>
Secuencias de imágenes	<input type="checkbox"/>	<input type="checkbox"/>

Interpretación de gráficos	<input type="checkbox"/>	<input type="checkbox"/>
Juegos de lógica	<input type="checkbox"/>	<input type="checkbox"/>
Elaboración de cuadros conceptuales	<input type="checkbox"/>	<input type="checkbox"/>
Mind maps	<input type="checkbox"/>	<input type="checkbox"/>
Trabajos grupales	<input type="checkbox"/>	<input type="checkbox"/>
Cantar-bailar-música	<input type="checkbox"/>	<input type="checkbox"/>
Peer reviewing	<input type="checkbox"/>	<input type="checkbox"/>
Peer teaching	<input type="checkbox"/>	<input type="checkbox"/>
Proyecto grupal	<input type="checkbox"/>	<input type="checkbox"/>
Proyecto individual	<input type="checkbox"/>	<input type="checkbox"/>

13. ¿Cuál considera es la actividad que con más frecuencia utiliza para presentar-practicar-aprender vocabulario? \*

- Spelling contest
- Lista de palabras para que los alumnos busquen el significado
- Escribir una oración con cada una de las palabras nuevas
- Clasificar/asociar palabras según significados
- Elaborar familias de palabras
- Proveer sinónimos
- Proveer antónimos
- Cuadros conceptuales
- Dictados
- Incluir las palabras en un relato
- Otro:

14. ¿Cuál de las siguientes actividades considera es la más eficiente para aprender tiempos verbales? \*

- Completar los espacios con la forma correcta
- Escribir acerca de algo utilizando X tiempo verbal
- Ejercicios orales de intercambio en grupo
- Quiz
- Role plays/ Dramatizaciones
- Otro:

15. ¿Qué tipo de tarea asigna usted como tarea para el hogar? \*

- Ejercitación escrita
- Trabajos en equipo
- Proyectos con entregas parciales y final a largo plazo
- Otro:

16. ¿Asigna usted tareas o proyectos para repasar temas vistos en otras unidades? \*

- Nunca
- A veces
- En algunos casos
- Con mucha frecuencia
- Siempre