Realizing Transitions: Common Core, College, Career

Patrick T. Randolph, Western Michigan University
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Editors
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Breaking the Ebbinghaus Curse for Vocabulary Acquisition with the R.E.S.T. Method

Patrick T. Randolph
Western Michigan University

Abstract

In 1885, Hermann Ebbinghaus, the great German psychologist, discovered that we forget up to 90% of what we learn within 30 days if we do not make a conscious attempt to retain the learned material. What is most troubling is that much of this information is actually forgotten just hours after the initial exposure. Ebbinghaus’s study has been reconfirmed with recent research in neuroscience (Kandel & Hawkins, 1992; Medina, 2009; Sousa, 2011). Applying these daunting numbers to our students’ retention of vocabulary, it is easy to understand why they forget a large percentage of the terms they study in their English language programs. This paper offers a solution to this conundrum by introducing the R.E.S.T. (Repetition, Emotion, Sensory Integration, and Teaching) Method as a means to help students learn vocabulary at a deeper level, retain it long after the initial exposure, and gain control over the definitions and uses of the terms with ease, confidence, and accuracy.

Introduction: The Problem

It is every English language teacher’s dream to see his or her students successfully acquire new vocabulary, use it properly, become familiar with its pragmatics, and ultimately retain it in their long-term memory. Once these initial tasks are completed, the students can then continue to use the lexical items to enhance their English language identity (see more on this in Guiora, Beit-Hallami, Brannon, Dull & Scovel, 1972). In reality, however, a great deal of the vocabulary we teach is often forgotten. In fact, Hermann Ebbinghaus, in his seminal work, Memory: A Contribution to Experimental Psychology (1885/1913), discovered that we forget 90% of what we learn within a mere 30 days. To make matters worse, his experiments showed that most of this loss of the newly acquired information occurs in the first few hours after the initial exposure. This discovery of over a century ago has been reconfirmed with recent research in neuroscience (Kandel & Hawkins, 1992; Medina, 2009; Sousa, 2011). This particular loss of information over a short period of time is what I call the “Ebbinghaus Curse” (Randolph, 2013a).

The question we face, then, is how do we “break” this curse? How do we get our students to remember the vocabulary we teach? The answer lies in a method I am developing called the Head-to-Toe Method for Vocabulary Acquisition, and a portion of that is the R.E.S.T. (Repetition, Emotion, Sensory Integration, and Teaching) Method, which focuses on tapping into key resources in the brain to help students acquire vocabulary and use it as naturally and correctly as possible.
A Brief Look at the Memory System

Before presenting the R.E.S.T. part of the Head-to-Toe Method, I think a brief look at our memory system is in order. From what we currently understand about human memory, there are three major kinds: (1) sensory memory, (2) short-term or working memory, and (3) long-term memory. For the purpose of this paper, I will focus on how instructors can successfully transfer vocabulary items from their students’ working memory to their long-term memory.

Long-term memory itself has two main categories: (1) declarative and (2) nondeclarative. The former deals with facts, emotions, facial recognition, general objects, and music. If we close our eyes a moment and think about our students, conjure up images of their faces, the sound of their voices, and the topics we recently studied together, then we are tapping into our declarative memory. If, on the other hand, we think about how to ice skate, hold a tennis racket in order to return certain serves, or ride a bicycle, then we are employing nondeclarative memory. Both forms of long-term memory require a three-step process in their formation: (1) encoding or inputting the new information into our brains; (2) storage or storing the newly acquired information; and (3) retrieval or extracting the information for use.

With a basic understanding of memory, let us return to our original question: How can we efficiently encode, store, and retrieve the vocabulary we teach and consequently break the Ebbinghaus Curse?

Background

Vocabulary acquisition has become a recent focus for both English language teachers and researchers (McPherron & Randolph, 2014). Yet, thus far, no foolproof method has been developed to help students truly take ownership of lexical items and transfer them from that abstract realm of language acquisition to a more personal world of visceral comfort. Pedagogists like Zimmerman (2008) have offered ideas such as vocabulary notebooks and word cards to help English language learners (ELLs) study and recall vocabulary. Even these, however, require a sound pre-knowledge or understanding of English. That is, in order to even consider the most common or best definition of certain multi-definitional terms (e.g., pick up, come up with) the learner needs to know an item’s register and be aware of its various possible uses. In short, although there are a number of useful suggestions, many are limited to high intermediate or advanced ELLs.

The R.E.S.T. Method, as we will see, is not, like so many other vocabulary acquisition strategies, limited to more advanced learners; but rather, it can be used to teach ELLs at any level from beginning to high advanced. In fact, this method could easily be implemented in K-12 ELL programs. A volunteer for the Bethania Kids Foundation in India, Carol Hart, is using it in her classes with children ages 12 to 18 (personal communication, June 21, 2014).

Objectives of the R.E.S.T. Method

The most crucial objective that the R.E.S.T. Method sets out to accomplish is to help teachers and students break the Ebbinghaus Curse. This is primarily done by inspiring ELLs to play with the language and to form a sincere ownership of the lexical items. The method also encourages them to become risk-takers in their learning and develop into language entrepreneurs. A further objective is to get teachers and students to peek into the spiritual or metaphysical realm of language and view words as extraordinary and powerful creatures.
The more they delve into word and phrase-dynamics, the more confidence they will gain in both themselves and in their ability to use the language.

**Implementation**

The elements of the R.E.S.T. Method are predicated on one common factor—to make as many neural connections (i.e., permanent links between neurons) as possible in the brain. For the more connections there are representing the memory of a lexical item, the stronger the recall of that item will be (Willis, 2006). That is, the actual physical connections between neurons are crucial in the learning process. The R.E.S.T. Method posits that there are more than one series of possible neural connections for one lexical item. In using all the components of the R.E.S.T. Method, we could—minimally—set three to four separate neural connections in motion.

It should be noted here that implementing all of the components of R.E.S.T. is unrealistic and perhaps even overwhelming in the beginning, especially if one is a novice at vocabulary instruction. I, therefore, suggest that instructors work on developing one element at a time, and then, when they feel ready to do so, incorporate all of the elements in their vocabulary lessons or the vocabulary portion of their respective language class. I typically use the first 20 to 30 minutes of a two-hour writing class to teach four to five new terms. Let us now take a close look at each aspect of the R.E.S.T. Method.

**R**epetition and **S**paced-Out Intervals of Review: **R**eview to **R**emember

The first step in breaking the Ebbinghaus Curse focuses on employing the repetition of newly taught lexical terms coupled with re-exposing the students to those terms at designated intervals (Ebbinghaus, 1885/1913; Medina, 2009; Willis, 2006). As Medina (2009) explains, “Memory may not be fixed at the moment of learning, but repetition, doled out in specifically timed intervals, is the fixative” (p. 130).

For instance, let’s say one teaches his or her students four new vocabulary items at the beginning of a reading or writing class. I first recommend that instructors elicit the definitions from the students using the Socratic method. This may require instructors to offer multiple examples so that the students can intuit the feeling and definition of the item in question. This step—in itself—provides multiple repetitions of the lexical items. Having the students supply the definitions gets them immediately engaged in the lesson, makes them feel like they are a part of the learning process, and nurtures ownership of the terms (Randolph, 2013b). It should be pointed out that instructors ought to make any corrections of the definitions as early as possible, as these initial moments of learning are pivotal in the encoding process (Sousa, 2011). After going over the definitions, the instructors should call on student volunteers to offer original example sentences for the terms. This step will also add to the number of repetitions concerning each term, but the importance here is that each time the term is repeated in a sentence, it will be unique and original, as the sentences will come from various students.

Once the students have studied the definitions and examples, the instructor should designate a particular area on the board (the upper left corner is a good spot) and write out the terms again so that they can be referred to and reviewed at spaced-out intervals during the remainder of the lesson. As the weeks of the semester progress, instructors can mix old and new terms together on this list, allowing for continual re-exposure to all the terms that the students learn throughout the course of the semester or session.
In short, step number one of the R.E.S.T. Method is to repeat and re-expose students to the vocabulary as much as possible. The students should also be encouraged to review the terms a few times on their own before the next class. For instance, studies have shown (Medina, 2009) that reviewing newly learned information before one sleeps is highly effective. It is now common knowledge that while we sleep, our brain still works away, solving problems, reviewing the day’s events, and learning what it deems important.

(E) Emotions and Personalizing the Vocabulary: Developing Word Ownership

Vernon E. Johnson (2003), in one of his thought-provoking lectures, insightfully claimed, “I am not an ‘intellectual.’ If anything, I’m an ‘emotional.’ I think most people are. Descartes should have said, ‘I FEEL, therefore I AM.’” The second aspect of this method thus rests on incorporating the use of emotions in our lessons. As Johnson wisely stated, we fundamentally are emotional beings. Emotions do—without a doubt—make us who we are.

Above, we briefly noted the three stages involved in the process of constructing long-term memory. Encoding, the first step in this process, is critical; it is the deciding factor as to whether or not information will be stored and later retrieved. The more emotional the content in the encoding stage, the better the chance students have of learning it. According to Medina (2009), “The more personal an example, the more richly it becomes encoded and the more readily it is remembered” (p. 115). These ideas are reinforced by Willis (2006), a former neurologist turned classroom teacher. She claims, “a student must care about new information or consider it important for it to go through the limbic system expeditiously, form new synaptic connections, and be stored as a long-term memory” (p.20).

The emotional content in our vocabulary lessons has profound consequences in the chemistry of our brain. When the brain reacts to emotional or personal content, the amygdala releases dopamine into the system. This sequence of events is important because the neurotransmitter, dopamine, is highly involved with memory, learning, satisfaction, and processing new information (Jensen, 2008; Medina, 2009). So, healthy emotions not only make us feel good, but they aid in the chemical process of how we learn.

In the fall of 2013, I conducted a short survey in my ELL speech and writing courses on the basic emotions (joy, sadness, fear, surprise, anger, and disgust) and their influence on learning vocabulary (n=42) (Randolph, 2013c). Fear was the top ranked emotion that motivated learning; it received 21 votes. Joy and surprise were tied for second with 20 votes each. Anger received 4 votes and sadness 3. Disgust received only one vote. All of my students were very clear in their additional comments that without emotion—be it a positive or negative one—they have difficulty retaining new vocabulary.

How, then, do we incorporate the emotions and personalize the content in our vocabulary lessons? First and foremost, the delivery of the material must be given in an exciting and emotional fashion. For, as Medina’s research has shown, “We don’t pay attention to boring things” (2009, p.71).

The energy level of the class, then, must be set as high as possible while simultaneously communicating the material with an effective presence. Instructors need to pay close attention to their gestures, facial expressions, and tone of voice. All of these play a pivotal role in the energy and emotional ambiance of the classroom.

The second key factor that helps elicit emotions is one I referred to above in the first segment; that is, to have your students create example sentences of the vocabulary terms learned in class. In doing so, the students will feel an immediate bond with the lexical items and develop a sense of personal ownership. “There is a strong possibility that the students
will personalize these examples, which will help evoke even more emotion and personal interest in the vocabulary” (Randolph, 2013c, p. 3).

The third use of emotion is a point I focus on in the Head-to-Toe Method in which I ask the students what specific emotion or combination of emotions they feel in regard to a certain word or phrase. For example, they may respond to a word like “democracy” with the emotional associations of “joy,” “bliss,” or “the feeling of freedom,” or they may respond to a word like “juxtapose” with “excitement,” or “fairness.” That is, when “juxtaposing” cultures, we all learn new things and this learning is filled with “excitement,” or in “juxtaposing” two ideas, one needs to show “fairness.” Although “fairness” and “freedom” are not emotions per se, they are “associations” filled with emotion for the learner in question, and the more associations we help the students create, the more neural connections they will develop. And the more neural connections they develop, the easier it will be for them to learn and recall the taught vocabulary.

And lastly, I find it very effective to use the students’ names, countries, cities, or some element from their cultural background in the example sentences. This will help them remember the meanings of the terms (Randolph, 2013b). In addition, it immediately grabs the students’ interest and adds to that all-important step of encoding. It also helps create associations with the lexical items on an emotional and personal level. (S) Sensory Integration: Multisensory Learning is Natural Learning

How much of what we learn is encoded in absolute isolation? If we answer honestly, we would say, “Very little.” Thus, the third component of R.E.S.T. is the application of sensory integration. In exercising this point of the method, I always introduce a vocabulary item by asking the students to tell me what color or odor they associate with the word or phrase we are learning.

If we reflect for a moment, most learning is multisensory in nature because we learn in a context brimming with various stimuli in the environment. For example, when one learned the word “snow,” it might have been outside on a cold winter’s day. The colors, textures, smells, sounds, and tastes of the experience all contributed to the moment the word was learned. Unfortunately, however, many vocabulary acquisition classes or lessons are unisensory or minimally bisensory in nature. That is, often instructors present a list of terms to the students and ask them to memorize the list (unisensory). If they are lucky, the instructor may go over the pronunciation of the terms as well (bisensory). So, minimally, they get the audio-visual elements of the terms. The incorporation of multi-sensory learning, however, is more helpful and elaborate because it creates more associations in the learning process.

Let’s take a recent example from a class I taught last fall. I was teaching the word “meticulous.” After eliciting the correct definition via an examination of various example sentences and going over its function as an adjective, I asked the students what color they see or odor they smell when I say the word “meticulous.” One student responded by saying, “I see orange.” When I asked why she chose that color, she replied, “My mother is meticulous, and she loves orange.”

If we take a look at this simple exchange, we can see a number of fascinating developments. First, by associating the term with the color, the student has taken one step closer to the realm of personalization and ownership of the word. Second, she has made an emotional association by linking the term with her mother; this, in itself, will, as above, help encode the memory of the term. And knowing how close this particular student was to her
mother, this was a powerful association, indeed. Third, there is a high probability that the 
association with this color, coupled with the emotional attachment to her mother, elicited 
emotional and learning-based neurotransmitters, which help in all three stages of the 
learning process: encoding, storage, and retrieval. Fourth, because she associated the word 
with her mother, there is a very good chance she also associated things like her mother’s 
face, favorite perfume, and even her voice with the word “meticulous.” All four of the above 
points reinforce how important it is to introduce a multisensory environment to vocabulary 
lessons, for, as Medina (2009) tells us, “learning abilities are increasingly optimized the 
more multisensory the environment becomes” (p. 207).

At the end of each semester, I have my students complete a brief questionnaire on 
the sensory integration aspect of the R.E.S.T. Method. Their responses are very favorable 
with respect to both color and smell. They claim that using these two components truly helps 
them learn the terms at a deeper level and with greater confidence and ease.

(T) Teaching Others and Talking About What You Learn: Learning is Teaching

Prominently displayed on page one of my class syllabi reads the following: 
“Whatever you learn in here, teach to others, for learning is teaching and teaching is 
learning.” I’ve always felt that learning is only optimized when one teaches what he or she 
has learned: It engages the mind on a whole new level and creates the needed sense of 
ownership and pride in making the material in question an actual “part” of the learner.

What is wonderful about this intuition of mine is that it is supported by members of 
the psychology and neuroscience communities. Craik and Lockhart (1972) called it 
“elaborative processing” (p. 68). This essentially deals with a detailed processing of 
information via thinking and or talking about it. This all results in the development of strong 
memories.

When students learn a new vocabulary term, I tell them that they have three choices: 
one, they can just forget it; two, they can remember it but keep it to themselves; or three, the 
pREFERRED action, they can talk about it and teach it to others. If they take the third option, 
then they will actually be using the R.E.S.T. Method in a natural and practical way: (1) they 
will be repeating the information and doing it at spaced-out intervals; (2) they will be adding 
emotion to the process by personalizing their examples; (3) they will be using some sensory 
aspect—the obvious element would be an auditory-based explanation; and (4) they will be 
thinking about it, talking about it, and teaching it to others. And what Medina (2009) has 
found is that “a great deal of research shows that thinking or talking about an event 
immediately after it has occurred enhances memory for that event” (p. 131).

To ensure that my students participate in the fourth and final aspect of the R.E.S.T. 
Method, I ask them to pair up and review the learned vocabulary. They can orally quiz each 
other in the traditional manner of question and answer by asking each other the definitions, 
but I prefer that they go through the elements of the method and add gestures. I have one 
student create a gesture that represents a term and ask his or her partner to guess the term 
related to the gesture. Then, I have them give example sentences, colors, smells, and 
emotions related to the terms and conclude with the parts of speech and register.

For example:

Student A: (Gestures like he is thinking.)
Student B: (Guesses.) “The term is ‘come up with.’”
Student A: “Yes! Correct! What does it mean?”
Student B: “To create, think up, produce, make or discover.”
Student A: “Good. Can you give me an example?”
Student B: “Yes. You came up with a good gesture for ‘come up with.’”
Student A: “Nice! What color or smell do you think of with this term?”
Student B: “Yellow. It’s like a light.”
Student A: “Good. What emotion do you feel?”
Student B: “Joy! Because creating makes me happy.”
Student A: “What part of speech is this?”
Student B: “It’s a three-part phrasal verb.”
Student A: “Is it formal or informal?”
Student B: “It can be used in both situations.”
Student A: “Good.”

**Evaluation: A look at surveys and testing results**

The R.E.S.T. Method has proven to be an effective way of helping ELLs to acquire more vocabulary at a deeper level of understanding in regard to how the lexical items work in a number of academic and nonacademic situations.

In order to give others a brief understanding of how the students perceive the method, I’d first like to address a recent student survey (n=32). In this end-of-the-semester questionnaire, I asked 32 students a number of questions related to their perceptions about whether or not they found the method effective and useful. Regarding the first statement of this survey: “I found this method useful,” 75% strongly agreed, 19% agreed, only 3% disagreed and another 3% strongly disagreed. With respect to the second statement: “The method helps me learn vocabulary at a deeper level,” 69% strongly agreed, 25% agreed, 0% disagreed and only 6% strongly disagreed. The statement I was most interested in is “I recommend other teachers use this method.” Here 69% strongly agreed, 28% agreed, 3% disagreed and 0% strongly disagreed. In short, the overall student perceptions of the method seemed to be very favorable. In fact, the one student who stated he didn’t find the method useful, still felt that other teachers should use it, because he believed students would benefit.

Perhaps the most telling set of results as to whether or not this method is effective rests on two semesters worth of test results (n=121). These tests were typically worth 25 points: 15 points for definitions and 10 points for correct use of the term in an original sentence. When not using the method, the class average on vocabulary tests ranged anywhere from 67% to 78%. However, when I tested the students after using the R.E.S.T. Method, the scores ranged from 83% to 95%. What is most inspiring is that the results of
five pop quizzes yielded averages of 85% to 96%. That means, even without studying the vocabulary outside of class, the method used during class time was sufficient enough for the students to recall and use the terms correctly.

Concluding Remark

At the onset of this paper, I posed the question of how it is that English language teachers can break the ever so daunting Ebbinghaus Curse and help their students truly learn and retain vocabulary terms. I offered the R.E.S.T. Method, a branch of my Head-to-Toe Method, as a viable solution. One documented benefit of this method is that it helps students gain ownership of vocabulary, because they can easily personalize the terms and the uses of the terms; it makes them establish a closer relationship, as it were, to the English language. This, in itself, helps create a stronger and sincere sense of control over the language. Second, the method allows the students to play with the vocabulary items, experiment with how they work in sentences and also investigate how they work with different registers in both spoken conversation and the written language. And third, it helps the students retain the vocabulary in their long-term memory and break the age-old Ebbinghaus Curse.

Author Note

Patrick T. Randolph is affiliated with Western Michigan University. Correspondence concerning this article can be addressed to Patrick T. Randolph at this email address: patricktrandolph@gmail.com.
References


Footnotes

1 There is much debate in the categorizing and labeling of short-term and working memory. Traditionally, these were considered two distinct forms; however, current research seems to point to them being one and the same. Many of these conclusions have been drawn because short-term memory is far more complex and much more important than once thought. Thus, short-term memory is actually a very profound working memory that greatly helps in the consolidation of long-term memory (Medina, 2009).

2 The amygdala is a key component of the limbic system. It plays a crucial role in processing memory, emotional reactions, and motivation. In particular, it is one of the most important centers for storing emotional-based memories.