

**The Effect of Visualization Techniques and Multimedia Use in Vocabulary Instruction,
Retention, and Production**

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Abstract

This paper explores the use of visualization techniques and multimedia resources in teaching English vocabulary to native speakers and second language learners. Until recently, vocabulary instruction was considered secondary to grammar, but with a recent shift in focus, new methods have become available to teach vocabulary more effectively, ensuring higher retention rates. Many students face difficulty when developing their English vocabulary, but through these new methodologies, they are better able to learn, retain, and correctly use vocabulary in context. The paper explores the natural language learning process, and compares it with the way students and adults learn language in a classroom environment. The role of short-term and long-term memory in vocabulary retention is examined, as well as the use of mnemonic devices and other reinforcement techniques. The paper introduces Linguizz, a series of advanced teaching methodologies that utilize visual intelligence and multimedia use in order to facilitate vocabulary instruction for a wide audience of students.

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The oldest writing systems are between 5,100 and 5,500 years old, from the Harappa, Mesopotamian, and Egyptian cultures (Whitehouse, 1999). The oldest cave paintings used in communication date back more than 40,800 years (Than, 2012). Humanity was expressing itself through visual imagery rather than written words for more than 35,000 years. Even today, with complex writing systems at our disposal, we still process visual images more rapidly than text. In the context of studying vocabulary, this has inspired new methods of learning abstract or conceptual words, one which veers away from traditional methods and seeks to engage the student's brain in a variety of ways.

83% of human learning occurs visually
– the most compelling communication
combines both visual and non-visual
content.

-OSHA Office of Training and
Education

Visuals are highly effective in the transfer of knowledge. A 1982 study by Levie and Lentz, comparing a text only learning environment to a text and illustrated one, found that approximately 87% preferred text and visuals over just text alone (Lentz & Levie, Vol. 30, No. 4). One recent article on the subject describes the evidently limitless capacity of long-term memory to store concepts, and then points to studies that seem to indicate that “pictures have a

direct route to long-term memory, each image storing its own information as a coherent ‘chunk’ or concept.” (TASI, 2002-2004)

Developing an extensive vocabulary is a challenge faced by many students of the English language, both native speakers and students of English as a second or foreign language. In addition, while some may develop an extensive vocabulary, they may have difficulty in using the words accurately in their speech and writing. They lack the ability to translate the definition of the word into a usable part of their personal lexicon. This can impact personal growth because vocabulary knowledge contributes greatly to the ability to express oneself effectively, a trait that is highly sought after in today’s job market.

With Linguizz, a new program developed by Infinit Software Solutions, Inc., students are able to not only learn new vocabulary words, but commit them to long-term memory with the ability to recall and use them accurately. This is due to the innovative methods that Linguizz employs, combining definitions with visuals and real-world examples to reinforce the new word the student has just learned. By developing and utilizing their visual and auditory intelligence skills, students can more easily remember new vocabulary, even if the word represents an abstract concept instead of an object commonly seen or used.

How We Learn New Vocabulary and How Visual Intelligence Increases Vocabulary Retention

“Communicating through language is the crowning achievement of the human species.” (Golinkoff & Hirsh-Pasek, 1999, p. 1) Yet, we are unable to communicate if we lack

the words to do so. Young children learn new vocabulary largely through example and experience, not by learning definitions from a dictionary. They learn new words through exposure to communication in their environment. However, at a certain age, less of our vocabulary learning comes naturally, and more of it comes through formal education, learning lists of new words in a classroom setting. In order to retain new words and use them in context, the words must be practiced. As has been pointed out in *Word Smart*, “You can’t incorporate a new word into your vocabulary unless you give it a thorough workout, and then keep it in shape through regular exercise.” (Robinson, 2006, p. 9) Also, for many words in the English language, there is not just one meaning of the word. Words have many nuances of meaning, and students must be able to differentiate between these if they wish to use the word correctly in context.

In order to teach students new vocabulary, several approaches have been taken. For many years, vocabulary teaching “was often neglected because it was thought that vocabulary could simply be left to take care of itself.” (DeCarrico, 2001, p. 285) Vocabulary was considered secondary to grammar, and thus was not emphasized in the classroom. However, since the late 1980’s and early 1990’s, there has been a shift in focus in the field of language instruction, and vocabulary teaching has been viewed as more important. (DeCarrico, 2001, p. 286)

By utilizing multiple avenues of learning new vocabulary, students are better able to remember and correctly use the words they learn. This is because the more often the word is used, the more easily it transfers to the student’s long-term memory. “Short-term memory has a small storage capacity and simply holds information temporarily while it is being processed,

usually for only a matter of seconds. The importance of promoting a deep level of processing is to transfer information from short-term to long-term memory, which has almost unlimited storage capacity.” (DeCarrico, 2001, p. 289) Students have perfected the art of “cramming” for tests, memorizing a vast amount of information long enough to regurgitate it on the test before forgetting it. However, to really ensure that the new knowledge is stored in the student’s long-term memory, new methods must be used. Why should a student have to wait for a definition in order to learn a word when they can look at the picture and understand the sense of what is being conveyed? As a study method, Linguizz is superior to cramming, as it provides the student with the opportunity to fully integrate new words into his or her own vocabulary and retain them for long term use.

“Cramming literally means forcing or shoving, and that’s exactly what a student does. He/she stuffs in too much information without really processing it. He/she may tend to simply memorize and remember things that he/she thinks will be asked in the exam without understanding. Even if one passes the exam, cramming is still to the disadvantage of the student. It has been scientifically proven that cramming only stores information as short-term memory, meaning after a few weeks or even just a few days, the information is already forgotten. Education can become such a waste.” – Paola Josefina Marcaida

One recent trend in the field of vocabulary teaching has been to incorporate multiple methods of learning new words, to reinforce the new vocabulary in the student’s mind. “It counts as general methodological knowledge that in learning languages, students should perceive the input through as many channels as possible. Therefore it is important to include a variety of stimuli in teaching.” (Joklova, 2009, p. 16) To achieve this, some vocabulary

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teaching tools such as Linguizz incorporate visual images as well as other forms in their presentation of a new vocabulary word.

What works the best for one student may not always work as well for another, as noted by Dunn and Griggs, who said, “Learning style is the biologically and developmentally imposed set of characteristics that make the same teaching method wonderful for some and terrible for others.” (cited in Oxford, 2001, p. 359) Because students learn in a variety of ways, it is important to include multiple pathways a student can take in their study of vocabulary. While visual students may gain more knowledge from reading and visual stimulation, kinesthetic and tactile students may benefit more from tangible objects or flashcards. Auditory students may not need visual stimulation and may thrive on listening and discussion. (Oxford, 2001, p. 360) Due to different learning styles, each student may benefit more from a specific type of information. With Linguizz, which will be discussed in further detail later, many different options are available to the student.

One method that has previously been used is called the Keyword Method. This has been referenced as an effective tool in learning vocabulary because it involves deep mental processing. The user creates a mnemonic device, associates a word with an image, or in the case of an ESL student, finds a phonologically similar word in their native language, and makes associations with the new word that is being learned. (Oberg, 2011, p. 120) While this method is useful in some cases, it has proven to be most effective when applied to concrete nouns or easily illustrated concepts, and is not as effective when applied to abstract words.

Even if the Keyword Method has been deemed to have limited use in the past, studies have still shown that users make progress when combining visual images with new vocabulary.

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In a 2002 study by Yoshii and Flaitz of a group of 151 adult ESL students, they “found that the group that studied vocabulary with a combination of text and picture annotations (as compared to text only and picture only) consistently outperformed the other two groups in both immediate and delayed testing.” (cited in Oberg, 2011, p. 121) Similar results were found in a study done with a group of Iranian intermediate ESL students. (Pishgadam, Khodadady, & Khoshabk, 2010, p. 15)

While the Keyword Method is of limited value, the idea of creating mnemonics to remember vocabulary words is still generally viewed as a positive technique. “Letting a new word suggest a vivid mental image to you is a powerful and effective way to remember that word. ... To be useful, your image must have something to do with the meaning of the word rather than merely with the way it looks or sounds.” (Robinson, 2006, pp. 25-26) Linguizz has taken this a step further. While *Word Smart* and other texts place more emphasis on creating odd or bizarre mental images for mnemonics, this could lead students astray if they can remember the image, but not the reason why they chose that image. In Linguizz, images are directly tied to their corresponding example sentences, which make them easier to recall and allows less likelihood for the student to get confused. If the student sees the word, its definition, a sentence that uses the word in context, and a picture that can be associated with the word, this reinforces the word itself in the student’s memory and aids in full comprehension for later use.

The main concept behind the development of Linguizz, which has grown from developing trends in vocabulary teaching, is the idea of visual intelligence and visualization as a memory and reinforcement tool. With traditional methods, there was more emphasis on

written definitions and examples. Images were occasionally used, especially in ESL texts, but not to a comprehensive degree. Most often they were used to depict concrete objects, scenes, or easily illustrated actions or emotions. According to McCarthy, “Concrete things are more learnable than abstract ones, therefore they are always taught first.” (cited in Joklova, 2009, p. 10) Using images for describing concrete objects works up to a point, but then the student starts to move beyond language that can only discuss concrete objects and into language that expresses more abstract concepts and ideas. Recently, there have been efforts to incorporate visualization into vocabulary instruction, and Linguizz has developed this technique to an extent that has never been done before.

What is Linguizz

While the idea of creating multiple forms of examples for each word is appealing, it is also a daunting task. Teachers often lack the time that it would take to create example sentences and pictures for long vocabulary lists, not to mention the tedious and costly task of obtaining licensing rights for images not in the public domain. By having Linguizz as a resource available to them, they will be able to teach vocabulary in new ways, using the program to reinforce the vocabulary lessons they give their students in the classroom. Linguizz does not seek to replace teachers in the area of vocabulary instruction, but rather to supplement their lessons and reinforce the material that is being learned. Linguizz can offer this help in a variety of ways. While similar concepts have been studied, no one has developed such a powerful methodology as comprehensive as Linguizz. The first of its kind in vocabulary

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instruction, it utilizes multiple methods to teach new vocabulary from an exhaustive list of over 30,000 academic words with premium content, which are part of a larger dictionary of more than 180,000 words. The dictionary has been drawn from Princeton University's WordNet 2.0 project, which resulted in a listing of over 210,000 current English words.

Linguizz was originally developed as a classroom methodology by Michael Bender in 2010, under the name ChallengEng™. Bender, who has worked with many students and professionals in their study of English, both as a first and second language, recognized the need for a new method of vocabulary instruction. In his work with students, Bender started trying this new method of integrated vocabulary learning, and due to its success, realized there was a need for this type of product in the market. With the backing of a corporate sponsor, Infnit Software Solutions, Inc., and an innovative CEO, Art Tozer, ChallengEng™ became part of a broader product strategy called Linguizz, which provides multiple options for vocabulary review. It is a series of advanced teaching and learning methodologies that utilize visual intelligence principles to enhance and facilitate vocabulary learning for first and second language learners. This ensures higher vocabulary comprehension and retention rates among students.

Like many online dictionaries, Linguizz provides the user with the option to either search or browse through the dictionary. However, it differs in that for each entry, the user is provided with not only the word and definition, but also an example sentence, an audio clip of the word's pronunciation, an image tied to the sentence, and live links that connect to real-time uses of the word in current news articles from a variety of online publications around the world. The sentence and the links allow the student to see the word used in context, and the

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image serves as a memory aid to further reinforce the meaning of the new word in the student's memory. The audio clip of the pronunciation is provided for each of the premium words, and serves as a helpful guide for the student while reinforcing the word through another form of sensory perception. In the Teacher's Edition, the teacher can decide which words to incorporate online or in print, and which sources to use for determining vocabulary success (e.g., a picture, word, definition, sentence, headline, etc.).

While many dictionaries include images for some definitions, Linguizz is unique in that it provides an image for every single entry in the premium database of more than 30,000 words. In order to tie more abstract words to images, an example sentence is used, which provides context for the word and definition. As mentioned earlier, the brain processes visuals more rapidly than text, and some people are more visual learners than others, so the image reinforces the meaning of the word. At the same time, since Linguizz seeks out headlines and stories from around the world, students not only comprehend the usage of the word but are also stimulated in multiple disciplines through exposure to the words in context.

Linguizz also provides the user with the ability to create flashcards for online or offline use in order to review a set of words. These can be created by the user, or chosen from a variety of pre-set lists. Each flashcard contains the image and word on one side, and the word, part of speech, definition, and example sentence on the other side. The flashcards can be especially beneficial when used in groups, as well as with ESL students. It provides an opportunity for discussion, and prompts the students to think of the word or concept in their native language and make associations with the English word. Linguizz also offers the option of purchasing flashcards of the top academic words, available in sets of 100 or 500 words.

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One other option for study using Linguizz is the advanced quiz function. Teachers or students can create quizzes based on pre-set word lists, or create their own unique sets of words. The words can be chosen from either the full premium dictionary of over 30,000 entries, or from a more specialized set of 5,000, 1,000, 500, or 100 of the most commonly used words in academic tests. Users have the option of quizzing themselves using the word, image, definition, or example sentence. These quizzes reinforce the words the student is learning, and will continue to re-use the same words until they have been answered correctly. With such an integrated program, it is easy for users to create quizzes that match with the words they have been studying.

Linguizz has now also made available lesson plans which were developed and used in actual educational settings (under the name ChallengEng™) that include original stories with academic vocabulary, correct and incorrect use of the words, quizzes to test knowledge of synonyms and antonyms, links to other stories using the vocabulary, sentence completions, and interactive exercises to strongly reinforce and involve learners.¹

Linguizz is ideal for use by a variety of individuals: homeschool students and their parents, teachers, ESL students in both the U.S. and internationally, and students who are studying vocabulary for a variety of standardized tests. For teachers, it has many advantages, as it is an interactive tool and can be used by multiple users, stimulating classroom discussion and reinforcing concepts and words learned in class.

Linguizz is now available in both a Student Edition and Teacher Edition, both of which offer many different tools for vocabulary reinforcement. It is clear through the research

¹ Michael Bender's non-commercial work with ChallengEng™ came under an umbrella program he developed known as Interactive Integrated English.

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documented here that the more opportunities a student receives to practice new vocabulary in multiple formats, the better he or she will be able to retain it. Exposure to the vocabulary increases the likelihood of retention, which in turn improves the student's overall vocabulary and improves his or her ability to communicate effectively.

“The more words you know, the more clearly and powerfully you will think and the more ideas you will invite into your mind.”

-Wilfred Funk

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