

## Using Comic Strips with Reading Texts: Are We Making a Mistake?

Roya Khoii, Zahra Forouzesh  
Islamic Azad University, North Tehran Branch,  
Iran

### Abstract

*This research examined the effect of using reading passages with comic strips on the development of young learners' reading comprehension. The study was conducted on 62 homogeneous female Iranian beginner EFL learners divided into two experimental and control groups. The learners in the experimental group used texts accompanied with comic strips in order to develop their reading comprehension ability, whereas those in the control group used the same texts without the comic strips. All of the participants received instruction in reading for three months, and at the end of the treatment the same post-test was given to both groups in order to compare their gains in reading comprehension. The result of a t-test for independent groups at the 0.05 level of significance revealed that there was no significant difference between the mean scores of the two groups. Therefore, it was concluded that using reading passages with comic strips does not have any significant effect on the learners' progress in reading comprehension.*

### 1. Introduction

Reading, according to cognitive systems, is the process by which individual words are identified from their printed and written forms, and by which we combine these words into simple ideas or propositions in order to be able to form a mental model of the text based upon the inferences that take us beyond the given information.

According to Grabe [10], the last decade, in particular, has been a time of much first and second language research resulting in many new insights for reading instruction. This expansion has contributed significantly to several factors: the efforts to address the needs of many different learner groups, the recognition that reading is probably the most important skill for

second language learners in academic contexts, and the challenge to explore and understand basic comprehension processes.

Scholars and teachers agree that having a high level of motivation is crucial in language learning. One well-known way to motivate foreign language learners to learn and to arouse their interest in this process can be bringing something extraordinary and new into the language class. Comic strips can be used efficiently for this purpose especially among teenagers and young adults because it brings a cheerful atmosphere into the class [5]. EFL and ESL teachers often give students reading materials accompanied by visuals such as pictures, cartoons, or comic strips to make reading more enjoyable and comprehensible.

Researchers like Levie and Lentz [13]; Levin, Anglin, and Carney [14] have outlined the five major functions of visuals in reading:

- **Representation:** visuals repeat the text's content.
- **Organization:** visuals enhance the text's coherence.
- **Interpretation:** visuals provide the reader with more concrete information.
- **Transformation:** visuals target critical information in the text and recode them in a more memorable form.
- **Decoration:** visuals are used for their aesthetic properties or to spark reader's interest in the text.

In the meta-analysis of the effects of visuals all but the decorative function facilitate memory. These functions are, in order of importance, transformation, interpretation, organization, and representation. The representational function overlaps with the other three (i.e., transformation, interpretation, and organization) because visuals always repeat part of the text's content, either the details or the relationships between the details.

In general, it can be claimed that comic strips are not only used for fun in a language class, but there are

also methodological reasons for teachers to use them. According to Oller's episode hypothesis [16], a text that has a story line and a logical structure is easier to remember and to recall. Comic strips provide the structure and stimulus to which students respond, and, since stories are universal, students from different cultures can understand their structure and identify themselves with the characters. This helps them to acquire vocabulary, grammatical and communicative competence and provides them with special cultural knowledge as well.

## 2. Literature review

According to Carpenter [1], visuals increase interest and attention given to the instructional program. They mainly help the audience to remember what the writer is trying to say. People are very dependent on their vision. According to his estimation, eighty three percent of all people learn through their sense of sight. What they learn about graphs can be applied to visuals to accomplish several goals simultaneously. Carpenter believes that education is a way to entertain when one uses visuals. They keep attention by keeping eyes on the topic and away from any distractions. Considering the comprehensive impact of visuals, he states that concepts are understood faster when texts are accompanied with visuals. This is because they provide the setting for more specific information on the topic shown. Understanding different concepts such as those about foreign places and new experiences is also made easier with visuals. He stresses that the audience can see what you present, and misconceptions are avoided. Good visuals clearly, as Carpenter believes, illustrate and support the verbal materials. In this way information is retained [1].

By using visual aids, teachers can attract the attention of the learners. Today there is a stress on the importance of visual support in teaching a foreign language, but they have more than one interpretation. Celce-Murcia [2] pinpoints the importance of using visuals in teaching reading as follows:

Visual materials are primary teaching tools for non-literate learners. It is necessary for instructors to select and create materials relevant to the interests, capabilities and needs of individual learners. Therefore, realia such as clocks, coins, calendars and maps are essential. Whenever possible, the instructor should use real objects.

In order to help learners read with comprehension, teachers are also advised to use advance organizers. An advance organizer is a cognitive strategy which allows

the learner to recall and transfer prior knowledge to the new information being presented. This theory is based on the idea that learning is facilitated if the learner can find meaning in the new information. If a connection can be made between the new information and previous knowledge, the learning experience will become more meaningful to the learner. Therefore, the new information will be learned. The advance organizer is not a strategy used by the learner, but rather an instructional strategy used by the teacher. In essence, the advance organizer is a brief, general speech prepared by the teacher, before presenting the new material, to introduce the new lesson. In designing the advance organizer recall of previous knowledge relevant to the new knowledge is important. It should provide a bridge that links the known to the unknown, by including an abstract outline of the new information and a restatement of old knowledge. If the advance organizer is enhanced by means of visuals such as pictures and comic strips, it might even be more useful in helping the students to create this link more easily and faster. Theoretically, this will encourage the transfer and application of old knowledge to make the new knowledge more meaningful to the learner.

Advance organizers are appropriately relevant and inclusive introductory materials introduced in advance of reading and presented at a higher level of abstraction, generality, and inclusiveness than subsequent to-be-learned reading materials. They are designed to provide ideational scaffolding for the stable incorporation and retention of the more detailed and differentiated material that follows. In short, they provide frameworks for the materials to be learned. Anything that can help learners relate new information to what they already know ought to be valuable. Advance organizers, in the form of a paragraph or two of the material prefacing the to-be-learned content along with some visuals could have beneficial effects on reader's comprehension and retention of materials.

### 2.1. Purpose of reading

Sometimes reading is erroneously called a "passive skill" because the reader does not produce a message in the same sense as a speaker or writer does. Believers in this idea maintain that reading never requires active mental processing for communication to occur. Today, however, reading is viewed as an active process requiring the reader to activate his background knowledge in order to recreate the writers' intended meaning.

There is a difference of opinion as to how meaning is derived from the written material. Some theorists believe that meaning resides in the text itself; while others believe that meaning is produced by the readers interacting with the text.

Readers should be aware of the purpose that a text is read for. Knowing the purpose, the skilled reader will be encouraged to employ the appropriate strategies for different comprehension goals.

Skilled readers are readily able to adjust their reading strategies, for example, to skim a newspaper, or to learn the main points of a chapter in a book.

## 2.2. Models of reading

With the purpose of providing a better explanation and insight into the complex nature of the reading process, scholars have strived to construct rhetorical models of what might take place when the mind associates meaning to the printed characters. These models have been classified in three major models of bottom-up, top-down, and interactive.

**2.2.1. Bottom-up reading.** Bottom-up processing includes the understanding of a text by analyzing the words and sentences in the text itself. It refers to the existence of meaning in the text itself, which is called the text-based view. In this view, reading is a process of decoding reading symbols, and working from smaller units to larger ones in order to arrive at the meaning. In this traditional view, reading is regarded as "a process of manipulating phoneme-grapheme relationships" [2].

Higher order structures, which are sentences, are then built up word by word as the reader moves through the text. In this perspective, information flow is from words, or even letters, to syntactic structures to discourse and semantic structures.

One early but particularly well-developed data-driven model was formulated by Gough [8]. He used the result of eye-tracking research as a starting point for his model. According to his model, readers proceed through a sentence letter-by-letter, word-by-word, and reading processes begin with an eye fixation in the first segment of the text, followed by a rapid eye movement, a second fixation, and so on through the text. Gough posited that each fixation places about fifteen to twenty letters in the iconic store (raw, unprocessed forms). Once that they are in the iconic store, pattern-matching processes begin, moving one letter at a time from left to right, concluding as estimate of a rate of three hundred words per minute for the reader.

He envisions that once pattern-matching processes on each letter are complete, a mapping response occurs in which the representations of the letters' sounds are recalled and blended together to form the representation of the sound of the word. Once the representation of the words' sound is complete, the word meaning is retrieved from the memory and the process repeats with the next word. The decoded words are held in the short-term memory, and the meaning of the sentence is determined there. If a clear understanding has been gained, the concept passes onto long term memory.

The *phonics approach* in the teaching of reading emphasizes decoding, sounding out and breaking the grapheme-phoneme code. In this approach letters are first recognized, and simple words are articulated. This approach views reading as a passive activity. It teaches reading through decoding, starting with the smallest units, single letters, building up to words and phrases. Children taught this way learn the sounds that the letters of the alphabet usually make, so that they can pronounce unfamiliar printed words. They may have to attain a certain level of proficiency in producing the appropriate letter-to-sound correspondences before they are exposed to words. This approach provides children with a much more general reading skill. In principle, they should be able to sound out any new word they come across.

A typical example of this approach is provided in the *letterland* teaching system, which links letter shapes with pictures that start with the appropriate sounds. For example, the letter *d* is made into the shape of a *duck*, with a round body and a neck on the right.

Phonics approach has been criticized for various reasons, the most prominent of which is that it ignores meaning in the reading process. Another is that it is impossible to determine the sound represented by the word until one has read the entire word. These criticisms and others lead to the development of an alternative known as the top-down approach to reading.

**2.2.2 Top-down reading.** This model has as one of its principles that reading is a process of reconstructing meaning rather than decoding. It is a process in which one begins with a set of hypotheses or predictions about the meaning of the text one is about to read.

Top-down processing makes use of the reader's previous knowledge, his or her expectations, experiences, scripts and schemas in reading the text. In this model one derives meaning not from the text and its grapho-phonetic, syntactic, semantic systems of the language, but by predicting and guessing based on their past experience and knowledge of the language.

The advocates of this model have adopted instructional strategies which stress activities such as guessing the meaning of the words from context, predicting what is going to be said next, reading for the main ideas of whole section paragraphs, looking for details, and reading rapidly to understand the overall theme of the passage.

In contrast with data-driven models, conceptually-driven models of reading comprehension place their emphasis on the guiding role of knowledge. Instead of describing reading as sequential, detailed, letter-by-letter, word-by-word analysis of the text to gain meaning, conceptually-driven models are based on the prime that readers' expectations about a text and their previous knowledge determine the comprehension process. In this view, readers use their knowledge and printed symbols on a page to construct meaning.

The top-down model sometimes fails to distinguish adequately between beginning readers and fluent readers. In other words, fluent readers in non-ideographic languages such as Chinese are readers who must learn to identify characters by their shapes (in ideographic languages, the characters do not represent sounds; rather they are derived from the object and entities they are supposed to represent).

Just as the bottom-up models have problems, so do the top-down models. One of the problems for top-down models is that for many texts, the reader has little knowledge of the topic and cannot generate predictions. A more serious problem is that even if a skilled reader can generate predictions, the amount of time necessary to generate a prediction may be greater than the amount of the skilled reader needs simply to recognize the words. In other words, for the sake of efficiency, it is easier for a skilled reader to simply recognize words in a text to try to generate predictions. Thus while top-down models may be able to explain beginning reading with slow rates of words recognition, they do not accurately describe skilled reading behavior.

Unlike Gough's [8] model which was based on analyses of eye-movement during reading, Goodman's [7] model grew out of his observations of children's errors in oral reading. In Goodman's research, the subjects were asked to read stories aloud that were somewhat difficult for them. Goodman's analysis of the kinds of mistakes the children made indicated to him that reading was generated by processes that led readers to predict the contents of upcoming text. Goodman believes that readers used the text as a means of confirming or disconfirming their predictions about what the text was going to say.

Unlike Gough's model of reading, Goodman's does not require a sequence of invariant steps. Instead, his model portrays four cycles of processing, occurring simultaneously and interactively: visual (picking up the visual input), perceptual (identifying letters and words), syntactic (identifying the structure of the text), and semantic (constructing meaning for the input).

Once a reader starts reading, an initial meaning is constructed for the text. This meaning is then the prediction against which the future input is judged. If the reader's prediction is confirmed, reading continues and the constructed meaning is enriched with new information. If the reader's prediction is incorrect, however, the reader will slow down, re-read, or seek additional information to construct a more accurate meaning.

**2.2.3 Interactive reading** This model has combined the two models of top-down and bottom-up; hence, it has been given the name interactive model. Basically, it stresses the inter-play of all the meaning gathering activities which take place during reading.

Reading is an interactive process in which readers constantly shuttle between bottom-up and top-down processes.

The interactive approach emphasizes the role of prior knowledge and prediction but, at the same time, re-affirms the importance of rapid and accurate processing of the actual words of the text.

According to Grabe [10], reading is also interactive in the sense that many skills work together simultaneously in the process so that working some of the skills reinforces learning the other ones. Reading is comprehension. Reading is flexible. The reader employs a range of strategies to read efficiently. These strategies include adjusting reading speed, skimming ahead, reconsidering titles, headings, pictures, and text structure information, anticipating information to come, etc.

Also, reading develops gradually. A reader cannot become a fluent reader suddenly and quickly. Rather, fluency in reading is the product of a long term investment of effort and gradual improvement.

The implication of the interactive model for reading instruction is that practices in both bottom-up and top-down strategies must be provided. This is very important for foreign language learners who often fail to comprehend written materials. Some language learners rely only on bottom-up processing and fail to take the advantage of previous knowledge (schema) and prediction into consideration. Other students, however, take the opposite strategy. They often overlook textual

clues and guess wildly at the meaning of the passage on the basis of incomplete preconceptions. Clearly, this over-reliance on one of these strategies and neglecting the others causes difficulties for EFL students.

### 2.3. Visual aids in reading

By using visual aids, teachers can attract the attention of the learners but not all research has found visuals to be beneficial. According to Oller [16], the failure of visual resources to aid instruction in some studies has often been explained as either a result of students' learning styles, or due to students not processing illustrations adequately. The latter is thought to be a result of the apparent ease of processing an image giving the students the false impression that they have fully understood an image when they have not.

Too much attention may be deployed to the illustrations themselves rather than to the accompanying text.

There are a number of possible reasons for the apparent superiority of images over text. First, processing visual material may require less cognitive effort. According to Crisp, & Sweiry [4], the general meaning of an image can usually be grasped in as little as 300 milliseconds. This may be because the elements of a visual resource can usually be processed simultaneously, whereas a text must be processed sequentially.

Another perspective is that visual and textual materials may be processed in different cognitive systems. Paivio's theory of dual coding explains the superiority of memory for images as a result of them being coded both as images and as their verbal labels whilst words are only encoded verbally [18]. Thus the two representations of one item result in bias towards information gained from visual resources. The dual coding of images facilitates the formation of a mental model since referential connections between the two representations will already have been produced. However, there has also been opposition to this view, and some have even claimed that images provided with text might be harmful since attention is split between the two forms of information, and the two sets of ideas that are triggered then have to be integrated.

In a review of studies on instructional texts, Levie and Lentz [13] found that in about 15% no significant effects of including images were observed. One possible explanation is that the choice of image is important. They understood that participants who read a text without a diagram were actually more motivated and more interested to continue reading than those who

read the same text accompanied by a poor diagram. This suggests that visual resources are not always beneficial and that the *quality* and *appropriateness* of a visual resource are likely to be important.

Researchers have used numerous theoretical frameworks to describe, explain, and predict the effects of visuals on cognition in general and on reading comprehension in particular, among them are the *mental model theory* [5] and the *dual coding theory* [Paivio, 17, 18; Sadoski & Paivio, 20]. The dual coding theory (DCT), which concerns the nature of language and imagery, can perhaps provide a framework to unify these disparate theories.

According to the theory, the human cognition consists of two subsystems that process knowledge simultaneously, one processing the nonverbal objects (i.e. imagery) and one dealing with language (verbal). The two systems have different functions; the verbal subsystem processes and stores linguistic information (words, sentences). Information is stored in discrete, sequential units that are called logogenes. Whereas the visual or imagery subsystem processes and stores images and pictorial information. Processing in visual systems is believed to be more holistic and based on continuous organizational units termed images. While the two subsystems can be activated independently, the interrelations and connections of the two systems allow the dual coding of information. The interconnectedness of the two systems permits cueing from one system to the other, which, in turn, facilitates the interpretation of our environment. Both visual and verbal codes for representing information are used to organize incoming information into knowledge that can be acted upon, stored, and retrieved for subsequent use.

These two systems enable the analysis of external scenes and the generation of internal mental images. However, unlike the schemata theory, DCT assumes that the verbal system is organized non-sequentially, resulting in different constraints in processing. According to Sadoski and Paivio [20], the structuring and processing of these mental representations, or encodings, is the basis of all cognition in this theory (p.43). The Dual Coding Theory can have applications in many cognitive domains, including problem solving, concept learning, language, etc.

In reading, DCT accounts for hypothesized bottom-up and top-down processes. Regarding bottom-up processes, DCT assumes that language units derived from natural language are organized and mentally represented in various sensory modalities. Based on the familiarity and effects of the context, the reader may use these representations to perceive grapheme-phoneme

correspondences, and the visual, auditory, and/or articulatory configurations of letters, words, or word sequences. Regarding top-down processes, DCT provides a broader and more specific account of meaning, coherence, and inference effects. Activating both verbal and nonverbal mental representations of texts helps readers create alternative, interconnected contexts for generating inferences and integrating text.

One of the most influential theories to be formulated in cognitive psychology in recent years is Johnson-Laird's [11] *theory of mental model*. The theory seeks to provide a general explanation of human thought; at its core is the assertion that humans represent the world they are interacting with through mental models. Johnson-Laird credits Craik [3] with the original statement of this idea. In order to understand a real-world phenomenon, a person has to hold what Johnson-Laird [11] describes as a *working model* of the phenomenon in his or her mind. Mental models are not imitations of real-world phenomena; they are simpler. They do not correspond completely to what they model—Johnson-Laird argues that adding information beyond a certain level does not increase its usefulness. A mental model which explains all aspects of the phenomenon that a person interacts with is an appropriate one. In order to provide explanation, it has to have a similar structure to the phenomenon it represents; it is this similarity in structure which enables the holder of the model to make mental inferences about the phenomenon which holds true in the real world. Since the choice of structure is not arbitrary, but analogous to that of the phenomenon, the mapping relationship between mental models and the phenomena they represent is a referentially isomorphic one. Thus mental models do exhibit similar characteristics to a picture-like representation; and, as with a picture-like representation, whether a model is appropriate or not can be a point of argument.

Humans employ a kind of mental logic, which is similar to the propositional logic employed by logicians when making inferences about the world. Johnson-Laird does not argue that human beings are incapable of logical inference, nor does he seek to devalue the concepts of mathematical logic. He simply seeks to explain the puzzle, posed by empirical and observational facts, that human beings are capable of logical inference, yet often deliver answers and decisions that cannot be explained in terms of logical reasoning.

There is overwhelming evidence that when a text is accompanied by adjunct displays (e.g., displays that appear outside the main body of the text such as

pictures), the comprehension of text information represented in the displays is facilitated [19]. Most researchers agree that this '*adjunct display effect*' (*ADE*) demonstrates that these displays are potentially effective and should accompany text when possible.

Among the more interesting explanations for the *ADE* is the one that focuses on the possibility that information contained in adjunct displays is processed differently from information contained in text. The *conjoint retention (CR)* hypothesis states that text information referenced in an adjunct display is encoded in memory both verbally and spatially, whereas text information that is not referenced in an adjunct display is encoded only in verbal format [17]. Thus, information that is encoded conjointly is more likely to be retrieved because the spatial representation provides an additional node that may be activated after an initial attempt to retrieve the verbal representation fails. For this reason, the spatial features of an adjunct display are thought to serve as a second stratum cue.

The *CR* hypothesis is basically an extension of dual coding theory [18] which contrasts concrete vs. abstract information. *CR*, however, contrasts only verbal vs. spatial information. Although the *CR* hypothesis was developed by investigating geographic maps, *CR* may also explain the *ADE* when using other the *ADE* when using other types of adjunct displays.

Lantz [12] looked at the research on the use of graphics and pictures in text instruction and reached the following conclusions:

- a. Illustrated visuals used in the context of learning to read are not very helpful.
- b. Illustrated visuals that contain text-redundant information can facilitate learning.
- c. Illustrated visuals that are not text-redundant neither help nor hinder learning.
- d. Illustration variables (cueing) such as size, page position, style, color, and degree of realism may direct attention but may not act as a significant aid in learning.

With a more complete understanding of how the mind works, we are beginning to realize that a new balance must be established between the use of images and the use of words. The brain is divided into two hemispheres, left and right. Both gather in the same sensory information but each half handles the information, or parts of the information differently. The left side, or logical left as it is known, is the analytical, verbal, sequential, symbolic, linear half. The right side allows us to have imagination, visualization, understand metaphors, and create new combinations of ideas; it is more spatial, holistic and relational.

### 3. The study

In this section, variables such as the research question, participants, instrumentation, and treatment of the study are explained.

#### 3.1. Research question

This research aimed at providing an answer to the following research question:

*Does using texts with comic strips have any effect on the reading comprehension ability of beginner EFL learners?*

#### 3.2. Participants

A total number of 62 female beginner students within the age range of 13-16 at an Institute in Tehran participated in the study. A standardized achievement test consisting of 80 vocabulary, grammar, and reading multiple choice items was administered to determine the homogeneity of the subjects. The students whose scores fell between one standard deviation above and below the mean were selected. Therefore, the final subjects of the study consisted of 42 students. They were later divided into two groups: 22 subjects in the control group and 20 subjects in the experimental group. The data were gathered from the beginner students studying Let's Go, book 5, units 1 to 8 in the course of 2 successive semesters (3 months). The passages were chosen from their course book.

#### 3.3. Instrumentation and materials

First of all, a standardized achievement test was given to 62 students. Those students who scored between one standard deviation above and below the mean were chosen as the subjects of this study. Then the four reading passages in the achievement test were also used as the reading pretest to assess the subjects' reading ability and to ensure that there was no significant difference between them in terms of their reading skill. After scoring the papers, the subjects were divided into two groups of twenty and twenty two. The instruments used in the study consisted of some texts and comic strips. The reading test consisted of several passages which were presented to the subjects in both groups. Each semester consisted of 18 sessions plus a midterm and a final session. Each session lasted 1:30 hours and was held three times a week.

At the end of the treatment, a posttest similar to the pretest was administered to the participants in both groups. The posttest consisted of 14 reading questions. Another posttest consisting of 22 questions was administered to the students in both groups in order to find out whether the use of reading passages with comic strips had any significant impact on the development of their reading comprehension. A secondary objective was to neutralize the practice effect because the students had taken the first posttest on a previous occasion. The second posttest which was administered to both groups was accompanied with comic strips for the experimental group, while the control group received the same test without comic strips.

#### 3.4. Treatment

The procedure for the presentation of the reading passages in the experimental group was as follows: at the beginning of the session, the teacher started the class with a warm up and then wrote the title on the board and asked the students to talk about it. The students read each paragraph in pairs and spoke about it. After that the teacher taught the passage with comic strips and asked some questions in order to find out whether they had understood them. Finally, the students talked about the passage using the comic strips, which had been made based on the sentences and not the overall messages of the passages.

The use of the native language was not allowed in the class; therefore, English was used in all the activities. The conventional procedure was used to introduce the passages to the control group. That is, first, the teacher started with a warm up in the class. Then scanning and skimming techniques were used. Students tried to understand the meaning of the sentences by using a dictionary or asking the teacher. Finally, the teacher asked some questions in order to make sure that the students had grasped the meaning of the passage. The classroom procedure followed a step by step guideline in the control group, and the teacher was obliged to follow the determined guideline to its details.

### 4. Analysis of findings

As mentioned before, an achievement test based on the book that the students had studied the previous semester was administered to the subjects in order to determine their homogeneity. Initially, the descriptive statistics for the achievement test were computed. To

estimate the reliability of the test, the KR-21 formula was used. The reliability index of the test was 0.94.

In order to guarantee the content validity of the test, the researchers asked their colleagues teaching the same book to the same level students to judge the level of the conformity between the table of specifications of the test and the table of contents of the book. They unanimously decided that the test enjoyed content validity and was at the right level of difficulty.

The four passages of the achievement test (with Flesch-Kincaid readability indices of 86.6, 87.5, 84.6, and 89.9 and a mean of 87.15) were also used in the reading pretest to assess the participants' reading ability and to ensure that there was no significant difference between them in terms of their reading skill. The time allocated to the test was 20 minutes. The descriptive statistics of this test were also computed in order to be used as a basis for further statistical analyses.

The result of a pooled variance between the variances of the two groups' scores on the pretest indicated that they enjoyed equal variances ( $F=1.58$ ). Moreover, an independent t-test was run to compare the mean scores of the control and experimental groups on the reading pretest. The t-observed value was 0.06, which was lower than the t-critical value of 2.021 at 0.05 degrees of freedom. This indicated that the difference between the means of the two groups on the reading pretest was not statistically significant.

**Table 1. Independent t-test for pretest means of the experimental and control groups**

	t-test for equality of means		
Reading	T	df	Sig (2-tailed)
Pretest (1)	0.06	40	2.021

\* $P < .05$

After the treatment, two reading posttests were administered to the students. The descriptive statistics of these tests are given below.

**Table 2. Descriptive statistics of reading posttest 1**

	N	Min	Max	Mean	V	SD
Ex	20	2	12	7.55	9.94	3.15
C	22	2	15	7.45	15.40	3.92

**Table 3. Descriptive statistics of reading posttest 2**

	N	Min	Max	Mean	V	SD
Ex	20	5	19	11.35	24.87	4.98
C	22	3	20	10.90	35.70	5.97

**Table 4. Descriptive statistics of reading posttest 2 for both groups together**

	N	Mean	SD	V	KR-21
Posttest (2)	42	11.11	5.46	29.86	0.85

Later, two independent t-tests were performed between the means of the control and experimental groups on the two post-tests. The results are given in tables 5 and 6.

**Table 5. Independent t-test for posttest (1) means of the experimental and control groups**

	t-test for equality of means		
Reading	T	df	Sig (2-tailed)
Posttest (1)	0.09	40	2.021

\* $P < .05$

**Table 6. Independent t-test for posttest (2) means of the experimental and control groups**

	t-test for equality of means		
Reading	T	df	Sig (2-tailed)
Posttest (2)	0.26	40	2.021

\* $P < .05$

A careful study of tables 5 and 6 reveals no significant difference between the means of the two groups on the posttests. Clearly, the experimental group did not outperform the control group on either of them. In other words, there was no significant difference between the means of the two groups at 0.05 level of significance at a *df* of 40, which indicated that the treatment had not been effective for the experimental group.

## 5. Implications

The results of this research can offer some pedagogical implications for language teachers and

textbook developers. They can be of interest to English teachers who are in search of effective techniques for improving students' reading comprehension ability. They also suggest that material developers designing textbooks for ESL and EFL learners should choose visuals cautiously. Whether they are pictures, cartoons, or comic strips, visuals should reflect the text's linguistic complexity and help readers process the linguistic input and retrieve the necessary information for output. However, as mentioned before, they might be distracting rather than helping students concentrate on the information in the text. Although striving to maximize comprehension by choosing visuals that are compatible with the text, they should also consider the readers' language proficiency levels. L2 reading teachers should use pictures and visual aids with caution, regardless of learners' age or stage of language development because overloading them with images might not challenge them cognitively. Teachers should also consider which types of visuals work better for learners at different proficiency levels.

## 6. Conclusions

Based on the results of the study, the researchers concluded that the use of comic strips with reading passages does not significantly improve the reading ability of elementary level foreign language learners. The students apparently did not need the pictures to support the simple texts used for them.

The mental model theory proposed by Marcus, Cooper, and Sweller [15], however, seems to offer a plausible explanation here. These researchers argue that graphics or illustrations can reduce the cognitive load associated with complex reasoning tasks because they can present essential information more concisely than equivalent textual statements. Illustrations are easier to process than text because they show spatial relations, whereas the text requires the reader to construct a mental representation of the relations. In other words, visuals facilitate mental model building. However, when comic strips do not reflect the text's linguistic complexities, simpler comics tend to interfere with readers' ability to construct a mental model as complex as the text. According to this logic, to construct an accurate mental model of the text, readers need visuals that closely mirror the text's structure and complexity.

The learning objective that the author is aiming to achieve must always be considered. Realistic images may motivate students more than line diagrams. They may gain the interest and attention of learners by

adding variety or providing a focus. Students appreciated more realistic images and detailed pictures. Of more importance is the fact that photorealistic images, particularly moving ones, may aid the understanding and learning of concepts that cannot be explained verbally for learners with a low degree of verbal understanding.

During the process of reading comprehension, readers consciously analyze and compare what they have noticed while reading. When the reader has difficulty comprehending the text's linguistic input because it is too difficult, the comic strip can call the reader's attention to the linguistic input. But comic strips can also distract the reader from the text's linguistic complexities, especially when they do not reflect the information embedded in the text. The differential effects of comic strips on the reading comprehension of learners at different levels challenges the commonly held assumption that comic strips accompanying texts can improve students' reading comprehension, thus calling into question Sadoski and Paivio's [20] claim that the DCT is universal.

There is also the danger that complicated realistic images may distract the student and impede learning. This is an important point when teaching students who have a low aptitude for the subject.

The results of this study suggest that the effects of comic strips on beginner L2 learners' reading comprehension might be constrained by a number of factors, such as the students' comprehension level of the written text and their individual strategies for processing the text. They also imply that, at least at elementary levels of language proficiency, more than visuals, students need to rely on their mental abilities, increase their world knowledge, and acquire the skills that make them better readers.

## 7. References

- [1] Carpenter, W. L. (1983). *Communication handbook*, 4<sup>th</sup> ed.). USA: Interstate Publishers.
- [2] Celce-Murcia, M. (1991). *Teaching English as a second or foreign language* (3<sup>rd</sup> ed.). USA: Heinle & Heinle Publishers.
- [3] Craik, K. J. (1943). *The Nature of Explanation*. Cambridge, UK: Cambridge University Press.
- [4] Crisp, V. & Sweiry, E. (2006). Can a picture ruin a thousand words? The effects of visual resources in exam questions. *Educational Research*, 48 (2), 139- 154.

- [5] Csabay, N. (2007). Using comic strips in language classes. *English Teaching Forum*, 44 (1), 155-157.
- [6] Gage, N. L. & Berliner, D.C. (1988). *Educational Psychology*. Boston: Houghton Mifflin Company, 279-310.
- [7] Goodman, K. (1994). *Reading, writing, and written texts: A transactional sociopsycholinguistic view*. In R. B. Ruddell, & H. Singer (Eds.), *Theoretical models and processes of reading* (4<sup>th</sup> ed.) (pp. 1093-1130). Newark, DE: International Reading Association.
- [8] Gough, P. B. (1972). *One second of reading*. In Kavanagh, J.F. & Mattingley, I.G. (Eds.), *Language by Ear and by Eye*. Cambridge, MA: MIT Press.
- [9] Gould, J. D., Alfaro, L., Barnes, V., Finn, R., Grischkowsky, N., & Minuto, A. (1987). Reading is slower from CRT displays than from paper: Attempt to isolate a single variable. *Human Factors*, 29 (3), 269-299.
- [10] Grabe, W. (1991). Current developing in second language reading research. *TESOL Quarterly*, 25 (3), 375-406.
- [11] Johnson-Laird, P. (1983). *Mental models: Towards a cognitive science of language, inference and consciousness*. Cambridge, UK: Cambridge University Press.
- [12] Lantz, C. J. (1995). Realistic visuals and instruction. *College Quarterly*, 2(4), 20-26.
- [13] Levie, W. H., & Lentz, R. (1982). Effects of text illustrations: A review of research. *Education, Communication and Technology Journal*, 30, 195-232.
- [14] Levin, J. R., Anglin, G. J., & Carney, R. N. (1987). On empirically validating functions of pictures in prose. In D. M. Willows & H. A. Houghton (Eds.), *The psychology of illustration: Volume I. Basic Research* (pp. 51-86). New York: Springer-Verlag.
- [15] Marcus, N., Cooper, M., & Sweller, J. (1996). Understanding instructions. *Journal of Educational Psychology*, 88, 49-63.
- [16] Oller, J. W. (1983). Story writing principles and ESL teaching. *TESOL Quarterly*, 17 (1), 39-53.
- [17] Paivio, A. (1971). *Imagery and verbal processes*. New York: Holt, Reinhart & Winston.
- [18] Paivio, A. (1986). *Mental representations: A dual coding approach*. Oxford: Oxford University Press.
- [19] Robinson, D., Katamaya, A., & Fan, A. (1996). Evidence for conjoint retention of information encoded from spatial adjunct displays. *Contemporary Educational Psychology*, 21, 221-239.
- [20] Sadoski, M., & Paivio, A. (2001). *Imagery and text: A dual coding theory of reading and writing*. Mahwah, NJ: Lawrence Erlbaum.