Foreign Language Vocabulary Retention: Investigating the Role of T-Coding Method in Comparison with Rote Rehearsal Learning

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Abstract

English as Foreign Language (EFL) learners frequently encounter difficulties in applying disparate strategies or techniques in order to recall the unfamiliar vocabularies. Language learners use vocabulary as a mean of reception and expression to acquire and convey meaning. Therefore, being able to remember new and unfamiliar words is outstanding for their success. Allen (1999) states that “vocabulary instruction is one of those educational arenas in which research and best practice are elusive”. The present study was an attempt to compare the effect of T-Coding method and Rote rehearsal learning on Iranian EFL learners' immediate and delayed vocabulary retention. For this purpose, two intermediate classes from a private language institute in Karaj, Iran were initially selected and randomly assigned to one of the two learning conditions: T-Coding Method and Rote Rehearsal Learning. One meaning recall test was administered one day after the treatment to check the learners' immediate retention and the other one was given two weeks later to check the learners' delayed retention. The findings revealed that T-Coding method produced better recall compared to Rote rehearsal learning, it means that those who learned words via T-Coding method outperform well both in the process of immediate and delayed retention. Therefore, mnemonic devices should be given prime attention by either EFL material developers or instructors as an efficient technique for vocabulary instruction, acquisition, and retention.

Keyword: Mnemonics, T-Coding method, Rote rehearsal learning, Immediate Retention, Delayed Retention.
Introduction

Teaching vocabulary is a significant factor in language teaching, since words play an important role in expressing our feelings, emotions, and ideas to others during the act of communication. In many EFL (English as a foreign language) classes, even where teachers have devoted much time to vocabulary teaching, the results have been disappointing.

During the act of communication words play an important role in expressing our feelings, emotions, and ideas to others. Learning vocabulary has an important role in acquiring a second language, which has been emphasized by Paivio (1986) as a part of Dual Theory. “Vocabulary learning is an important goal in itself, far more important and complex than it is generally conceded by teachers of foreign languages” (p. 256).

Wenden (1987) reminds us of an old Chinese proverb which states as follow: “Give a man a fish and he eats for a day, teach him how to fish and he eats for a lifetime.” It means that if learners are just supplied with ordinary way of vocabulary learning, only their current problem is solved. However, if the students are taught vocabulary learning strategies, they may be empowered to manage their own learning. Learners need to learn how to learn and teachers need to learn how to facilitate the process (Oxford, 1990, p. 201).

According to Chamot & O'Malley (1996) Strategy instruction can help students in different ways: Firstly, by strategy training students will be better trained and by gaining the skill in using those strategies they will be independent and confident learners, and secondly, they will be more motivated when they understand the relationship between strategy use and their success. In the process of identifying and categorizing language strategies, many studies dealt indirectly with strategies specifically applicable to vocabulary learning. In fact, as O'Malley et al. (1985, p. 561) noted, “Training research on learning strategies with second languages has been limited almost exclusively to cognitive applications with vocabulary tasks”.

O'Malley and Chamot (1990) divide language learning strategies into three major types: metacognitive, cognitive, and social/affective strategies.

Vocabulary retention has been defined as “the ability to recall or remember things after an interval of time. In language teaching, retention of what has been taught may depends on the quality of teaching, the interest of the learners, or the meaningfulness of the materials” (Richards & Schmidt, 2002, p. 457).

One of the best and most effective strategies in improving both immediate and delayed retention of second language words is mnemonic.(Atkinson, 1975) Mnemonic strategies refers to memory aids for enhancing the memory and making information more meaningful. Acrostics, acronyms, keyword, loci, and pegword method are different types of mnemonics.
Kenneth Higbee (1977) explained how training in memory aids, i.e., mnemonic techniques can be readily applied to a wide range of material that is to-be-remembered. Mnemonics are not only helpful in recalling concrete information, e.g., a shopping list, names, and faces but can also be efficiently applied to abstract concepts, e.g., a poem, lecture on philosophy, etc. Having a trained memory can be as effective for recalling information as speed reading is for absorbing written material. Not only do students remember more, but they do so more efficiently and effectively.

T-Coding is the new version of mnemonics in which concept making is the most important T-Coding phase. Generally speaking, it includes three phases: first a link is identified and created in the first language or it can be a second/foreign language link that the learner already knows, then for this link a real life example and explanation (universal code) provided to include both the link and the word, after that it should be used in a sentences so as to create more connections in the memory (Taraghi, 2015).

In this method the concept of the new words is created through explanations and examples, while in the previous strategies, an image was tried to be created which was sometimes impossible in abstract words. There is no limitation for T-Coding as is with the keyword method, the most acceptable mnemonic strategy. In fact in T-Coding words are not taught but implanted in the memory with the real life examples which exists in the learners’ current memory. The dual informational coding system, dual process theory of memory, connectionism theory, and concept making are foundation for T-Coding method (Taraghi, 2015).

In order to facilitate the maintenance of vocabularies better and also faster, Taraghi (2015) revealed 14 categories in his conference in the university of Texas at Austin which each one employs special features in order to implant the idea and meaning in the learners’ mind. These categories will be explained in the following statements along with some tangible examples:

1. Imagery codes: The codes used to form mental pictures of objects or events not present to the eye and connect the words with those in the native language, Persian, which associates well with a real image that can then affect later recall and comprehension. The theoretical position behind the notion of imagery strategy refers to constructivism. Spivey in 1987 considered three sub-processes of the notion of constructivism that are subsumed within the constructive process. These include the organization, the selection, and the connection of concepts through the construction of inferences or elaborations.

A wide range of vocabularies can be taught based on imagery codes such as bulky, typical, survive, flexible, and slender.

English word: Bulky /ˈbʌlki/
Persian code: (bul) بال=
Persian equivalent: حجم.بزرگ
2. **Sentence in pronunciation codes:** This feature related to those vocabularies that sentences can be formed out of their pronunciations. These kinds of codes are considered as the best one since the pronunciation leads to a sentence which help language learners remember to-be-learned information.

A large number of vocabularies can be taught based on Sentence in pronunciation codes such as: vicinity, dread, appealing, detest, reptile.

**English word:** vicinity /və-ˈsi-nə-tē/

**Code:** we see vicinity.

3. **Exact Word in pronunciation codes:** As mentioned earlier, the pronunciation of the vocabulary plays a crucial role in preparing the codes. These types of vocabularies are well-considered as the easiest and the most retrievable ones since they have the exact equivalent in the native language, Persian.

Some vocabularies possess this feature are as follow: technology, placard, charlatan, burden, theory, amateur, and censor.

**English word:** technology /tek-ˈnä-lə-jē/

**Code:** technology

**Persian equivalent:** تکنولوژی

4. **Orthographical form codes:** Some retainable shapes were designed out of the orthographical forms of vocabularies. Although this way of providing code is powerless, it can be applicable for several vocabularies.

Descend, ascend, idle, idol, and vertical own this feature.

**English example:** descend /di-ˈsend, dē-/  

**Code:** d (d ): to write/d/toward down.

**Persian equivalent:** فروکش کردن, غرق شدن, پایین بردن

5. **Juxtapose codes:** In the process of Juxtapose codes two words are coordinated together. The pioneer of the method believes that although there is not specific hint in this feature, words can be retained well due to using companion in producing these codes. Juxtapose codes are considered as the well-remembered codes since the retention's speed is faster. Several words belong to this specific feature such as novel and means.

**English example:** Novel/ˈnä-vəl/  

**Code:**  

**Persian equivalent:** دیروز از بازار یک novel کتاب خریدم.  

**دیدیم, رمان**
6. Hold in meaning codes: Some codes own the equivalent meaning spontaneously in themselves, therefore; we can grasp the meaning based on the existence code in the words. The question rise here is that “why do not we use all codes similar to this feature?” It should be asserted that if something is used in a routine way, it will not only be tedious but also will not be traceable by the mind as well. Therefore; applying disparate types of codes is a paramount necessity which is highly emphasized in T-coding method. Among the words that possess this characteristic we can refer to affluent, callow, and furtive.

English example: callow /ˈka-ˌlō/  
Code: (Call=کال =immature)  
آدم های کال و بی تجربه هستند.  
Persian equivalent:

7. Historical reality concept codes: In fact in creating these kinds of codes the originator of the method exploited the concepts expressing the truth that has been established according to the historical facts. All these codes refer to a historical belief that has been on our minds since childhood. As these concepts have settled in our mind along with their images since our childhood, activating them leads to recall the words as easy as a piece of cake. Variant words encompass this characteristic like spontaneous, squander, victorious, and deceive.

English example: victorious /vik-ˈtər-əs/  
Code: victor  
موفق، فتح، پیروز
Persian equivalent:

8. Social belief concept codes: The beliefs by which groups in a community identify themselves are used in order to construct these codes. These social beliefs are sets of ideals and worldviews: They are coherent from inside; they appear to be true once they are accepted, and they seem to be wrong once they are dismissed. Certain words comprise this feature such as sinister, valid, bigamy, prominent, hesitate, and adequate.

English example: Sinister /ˈsi-nə-stər/  
Code: (Si=سی = Number 30)  
این سی نیست که Sinister هست بلکه اون سیزده است.  
Persian equivalent:

9. Action codes: An action code refers to a concept that can be expressed in the form of an action which is done or performed. Several words bear this feature such as eliminate, tempt, unique, mount, and migrate.
English example: Mount /ˈmaʊnt/
Code: Mount

من از اون کردم.

Persian equivalent: صعود کردن، بلند شدن، بالا رفتن

10. **Self-made concept codes:** The initiator of the method made an attempt to provide some innovative concepts. It should be considered that those concepts would be real or fake; in other words there is no certainty or scientific fact behind them. As it was mentioned previously the pronunciation of the words play a crucial role in preparing these codes. There are many words that self-made codes help learners to retrieve them better such as fiction, frank, torrent, vague, and unanimous.

English example: frank /ˈfræŋk/
Code: Frank Frankfurt

هستند.

Persian equivalent: سریح، رک، بی پروا، رک صریح

11. **Lie concept codes:** The pioneer of the method generated some false concepts with deliberate intention. The weirdness of these concepts which convey the false impression facilitates the learning condition. Several words contain this feature such as absorb, defraud, pollute, lubricate, and calamity.

English example: Absorb /əb-ˈsɔrb, -ˈzɔrb/
Code: (Ab=water=آب، Sorb= Lead=sرب) آب سرب را به خوشش می کند.

Persian equivalent: مجنوب کردن کاملًا فرو بردن در جنب کردن

12. **Imperative concept codes:** Imperative concept codes can express a different emotion or desire. Moreover, they issue a request, give a command or express a desire or wish. Expressing strong feeling, or asking a question assist learners to retain provided information better and also faster. It is worth pointing out that most of the imperative concept codes are short and simple. Several words embody this feature are as follow: narrow, debate, assemble, drench, ballot, and retain.

English example: Narrow /ˈner-/, ˈ na-(,)rəʊ/
Code: (Narrow=نرو=Do not go) از کچه های تنگ و نرو.

Persian equivalent: تنگ دراز و باریک محدود، باریک
13. Joke concept codes: As the name suggest Joke concept codes refer to those codes that something is said or done to evoke laughter or amusement, especially an amusing story. Learning a second language requires a particular positive atmosphere in the classroom. In the field of foreign language teaching there are numerous suggestions for the use of humor in the language classroom (Cornett, 1986; Fisher, 1997). Since using humor can promote understanding, and hold the attention of the students, learning vocabularies will be easy and also more enjoyable for the learners. Several words like deride, horrid, wail, reluctant, and devise own this characteristic.

English example: Reluctant /ˈrelək-tənt/
Code: (luc=لاک, tlant=نالتارت) پسرها از لاک زدن بی میل هستند.

14. Scientific concept codes: The codes which regulated by or conforming to the principles of exact science. Many words can be taught according to this attribute such as survive, maim, threat, source, preserve, and vessel.

English example: Survive
Code: (Surv=سرود=Cedar) درخت سرو حتی در هوای سرد هم می ماند. Survive درخت سرو حتی در هوای سرد هم می ماند.

Participants

The participants of this study were 80 intermediate female students studying English at Jahad Daneshgahi institute in Karaj, Iran. They were selected out of 120 EFL learners who took a Standardized English Proficiency Test (i.e. Nelson test) based on the results of their performance. The learners whose scores fell one SD above and below the mean on the Nelson proficiency test were selected to take part in the study. This ensured that all the participants were homogeneous regarding their English proficiency. Most of the participants had previously passed starter, elementary and pre-intermediate classes. All the participants were either high school or university students in different fields. The participants’ age ranged from 14 to 21. The participants were randomly divided into two groups.

Instrumentation

The researcher constructed two booklets for each teaching condition. One of them for the T-Coding condition consisted of only English words and the other for the Rote rehearsal learning included the English words and their Persian equivalents. The other instruments used in this study consisted of a Nelson English proficiency test and three vocabulary tests: one of them as the pre-test and the others as the post-tests.
Procedure

In this study, the researchers utilized a Nelson proficiency test to place the participants in a range of one standard deviation below and above the mean (26.508). Allotted time for this test was no more than 25 minutes and all attendants finished just in time. To ease the process of correction, an answer sheet was constructed consisting of 50 multiple-choice boxes for the participants to mark with pencil. Before administering the test and after the distribution of test and answer sheets as well, the researchers explained the instructions in participants’ native language (Persian). After 25 minutes, they were asked to put their pencils down and all answer sheets were collected for data analysis.

In order to homogenize the participants, measures of central tendency including mean scores and standard deviations of the test were performed. The number of students who participated in this test was 120. The range of scores was between 10 and 44. The reported mean was 26.508 and those participants whose scores were approximately in the range of 25.5 to 32 (about plus or minus one standard deviation) were selected; therefore, 80 participants were chosen as the final sample.

According to their scores, the participants were randomly divided into two groups. Members of both groups were females. To check whether the determined groups were homogeneous an F-test was applied. Results of F-test (0.007) showed that the T-Coding method was not significantly different from Rote rehearsal learning.

To ensure the homogeneity of learners regarding their knowledge of vocabulary prior to the treatment, a list of 450 vocabularies (taken from current vocabulary sources used in Iran) were given to the students to write down the meaning of the words either in English or Persian. As it was essential to recognize how many of them were familiar to the students to check the effectiveness of the words on both their immediate and delayed vocabulary retention as well. Accordingly, those words of this list which were unknown to the learners were selected and the rest were omitted from this list. The pretest and the posttests of the study were also developed based on these selected words procedure, finally 150 words randomly selected out of those unfamiliar words for the treatment. Out of this list 120 questions were designed, 40 questions were considered for pretest, 40 questions for post-test 1, and the other were allocated for post-test 2. To estimate the reliability index of the pre-test and two post-tests Cronbach's Alpha coefficient was used and the obtained result for the pretest was 0.71. The obtained Cronbach's alpha coefficient for posttest 1 and posttest 2 were 0.65 and 0.69, respectively.

In the first stage of the study, a test consisting 40 multiple choice questions used to identify the level of vocabulary knowledge for participants. They were supposed to mark the answer on their answer sheets in 20 minutes. The answer sheets were gathered and scored by the researcher, the true response to each item was awarded 1 point; while, for each item that was unmarked or marked erroneously, zero score was assigned.

The participants in the T-Coding method group received the same words as the participants in the Rote rehearsal learning group. Unlike the Rote rehearsal learning group, in T-Coding method group there is a code of the similar sound to Persian word along with some concepts provided by the instructor for the learners between each English word and the Persian
equivalent. They received their booklets included only the English words. After explaining the T-Coding method to the learners, underlined the hints and then provided a connection between the foreign words and their own language, Persian. She supplied the most appropriate concepts for the learners as well, then she asked the learners to write down those concepts and their definitions in their booklets; furthermore she asked them to repeat the words and their concepts along with their meaning chorally. The class held just in one session and took four hours long, it should be noted that after 2 hours they had a 15-minute break time in favor of refreshing their minds.

The participants in the Rote rehearsal learning group received their booklets for the memorization condition included the English words and their Persian equivalents. They received a total of 150 words to study and used conventional methods of learning vocabularies. The words and their Persian equivalents were written on the board by the instructor and the students were supposed to listen and repeat aloud, as repeating aloud has more influence on learning than repeating silently. After finishing the repetition, they were offered to have a 15-minute break time. Then they were asked to read the words for themselves silently. Similar to the experimental group, the class held just in one session and took four hours long.

After the treatment, the two groups were tested two times; allotted time for each test was 20 minutes. A day after the treatment session the first test was given to both groups, this test consisted of 40 multiple choice questions in order to check the students’ immediate retention. Two weeks later, another test was given for the second time to check the students’ delayed retention. After the collection of data, the participants’ scores were obtained by adding up the correct answers. Each participant’s total score fluctuated between 3 and 40.

Data analysis

In order to analyze the collected data multivariate analysis of variance (MANOVA) was conducted as the dependent variable of the study was measured at three stages. To show the differences between two group three independent t-tests were applied.

Data analysis

Some descriptive and inferential data analysis procedures were performed:

Table 1. Descriptive results of mean and standard deviation of pretest and posttests in both experimental and control groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>T-Coding method</td>
<td>2.32</td>
<td>1.92</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Rote Rehearsal</td>
<td>2.27</td>
<td>2.03</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posttest 1</td>
<td>T-Coding method</td>
<td>32.17</td>
<td>7.47</td>
<td>40</td>
</tr>
</tbody>
</table>

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As it can be seen in the table, in the descriptive level, an average of two experimental and control groups in all three tests (i.e. pretest, posttest 1, and posttest 2) are different. These results indicate that T-Coding had been of more beneficial effects than the Rote rehearsal learning on the learning and retention of the vocabularies; however, in order to determine if the differences among means were significant or not, multivariate Analysis of the Variances was run on the data. The results showed that the differences among means were statistically significant (Table 2).

Table 2. The results of multivariate analysis of variance (MANOVA)

<table>
<thead>
<tr>
<th>Variable</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>0.050</td>
<td>1</td>
<td>0.050</td>
<td>0.013</td>
<td>0.91</td>
</tr>
<tr>
<td>Posttest 1</td>
<td>5899.613</td>
<td>1</td>
<td>5899.613</td>
<td>119.346</td>
<td>0.000</td>
</tr>
<tr>
<td>Posttest 2</td>
<td>9052.513</td>
<td>1</td>
<td>9052.513</td>
<td>209.370</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Based on the above table, the lack of significance in pre-test (not a significant difference between the T-Coding method and Rote Rehearsal learning groups in the pre-test stage) and being significant in both posttests (significant differences between T-Coding method and Rote Rehearsal learning groups in terms of both immediate and delayed retention). T-Coding in case of enhancing learning both in terms of delayed retention as well as immediate retention has a positive effect.

Table 3. Results of the independent t-test to evaluate differences between the groups in terms of pre-test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>T-Coding</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Rote Rehearsal</td>
<td>0.0</td>
<td>0.99</td>
</tr>
</tbody>
</table>
Table 4. Results of t-test to evaluate differences in terms of post-test 1

<table>
<thead>
<tr>
<th>Posttest 2</th>
<th>Levene's Test for Equality of Variances</th>
<th>(2-tailed)</th>
<th>Difference</th>
<th>Error Difference</th>
<th>Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equal variances assumed</td>
<td>0.98</td>
<td>0.32</td>
<td>0.11</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.91</td>
<td>0.05000</td>
<td>0.8328</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.9328</td>
</tr>
<tr>
<td></td>
<td>Equal variance not assumed</td>
<td>0.11</td>
<td>3</td>
<td>77.75</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.91</td>
<td>0.05000</td>
<td>-0.8328</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.9328</td>
</tr>
</tbody>
</table>

Table 5. Results of t-test to evaluate differences in terms of Post-test

<table>
<thead>
<tr>
<th>Post-test 1</th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>1.248</td>
<td>0.267</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>10.925</td>
<td>76.711</td>
</tr>
</tbody>
</table>

Table 4. Results of t-test to evaluate differences in terms of post-test 1

Table 5. Results of t-test to evaluate differences in terms of Post-test
Considering the lack of meaningful Levene's test (p> 0.05) applying t-test to compare the groups is permitted. Moreover, based on the significance level of the results reported in table 3 (p> 0.05) there is no significant difference between the T-Coding method group and the Rote Rehearsal Learning group in the pre-test scores. However, According to the results reported in the table 4 and 5 (P <0.01) there is a significant difference between the the T-Coding method group and the Rote Rehearsal Learning group in posttest 1 and posttest 2 as well.

Conclusion

The present study was set up to investigate the role of T-Coding method in comparison to Rote Rehearsal Learning on Iranian EFL learners’ vocabulary retention.

Most relevant studies are findings by direct comparison of the conventional meaning and keyword. Regarding mnemonic strategies, Thompson (1987) concluded that mnemonic aids, particularly the keyword method, help learners to memorize words more effectively. Pressley, Levin, and McDaniel (1987) emphasized that through mnemonic aids such as the keyword method a direct link is made between the word and the associated definition.

In DCT, it is assumed that the dual encoding of imagination in verbal and imaginal forms enhances elaboration, comprehension, and memory by producing extra memory traces and more acceptable retrieval paths. Since T-Coding triggers activation in both verbal and imaginal system, it was expected to produce the better results than the other conventional methods such as rote rehearsal. Furthermore, it was expected to be superior than the keyword method, because although the keyword method also activated both the verbal and imaginal systems, T-Coding would provide much more elaboration in the verbal system and more referential connection between the two systems not only for the concrete words which are the integral parts in keyword method but also for the abstract words as well. Some investigations revealed that the words with concrete referents were more successfully recalled than the words with more abstract referents especially those vocabulary items which the instructor had been able to establish a stronger mnemonic relation. Hulstijn (1997) states that the keyword method can be effective for concrete words only, so T-Coding disqualifies Hulstijn's (1997) position to assume an unquestionable validity. Raugh & Atkinson, 1975; McDaniel & Pressley, 1984; Rodriguez & Sadoski, 2000 in their findings emphasized that the key word method led to a stronger retention of vocabulary items than the classic memorization practices. As few examples, the obtained results stand in harmony with the findings of
Pressley et al. (1982), who showed that those learners who used key word method were more successful in learning and retaining the vocabularies than those who only memorized the vocabularies. Similarly, the findings are consistent with those of Baleghizadeh and Ashoori (2010) who conducted a research to compare the effect of keyword and word list methods on immediate retention of English vocabulary in a natural classroom setting. They concluded that the keyword method produced better recall compared to the word list method, suggesting a promising educational value for its utility. Likewise Levin et al. (1992), Beaton et al. (2005), and Nemati (2009) among others demonstrated that mnemonic keyword method results in more efficient vocabulary learning and long-term retention than the other methods.

**Pedagogical Implications**

The first and most advantage of T-Coding is that it saves time a lot. As we move forward in our field of language teaching we can easily see that learners seek to find the easier and faster methods of language, therefore T-Coding can fulfill their needs. In addition, as data demonstrated, retention through this method both in short term and long term was superior to the other methods. Furthermore, there is no difficulty in learning vocabularies in this method because it involves jokes, stories, and also it keeps learners alert in the class room. No complex process is involved in this method, it only consists of three phases, creativity link which has been made before presenting in the class, creating concepts and explaining them to the learners, that’s how this method works well. There is no claim that T-Coding is the only best way in teaching vocabulary learning and retention, it may have some disadvantages as well, however the advantages outweigh the disadvantages. One more implication to consider is that it can be applied to all languages; the only necessity is that teachers learn how to make codes and present them to learners.

**Suggestions for Further Research**

Considering the research findings and limitations of the current investigation, some suggestions for further research possibilities are introduced as follow:

- To examine T-Coding on a larger number of learners, both female and male, and on different level of language proficiency, and also on different ranges of learners’ age
- To imply further studies with more participants from other nationalities
- To examine different types of mnemonic devices on EFL learners’ vocabulary recall aside from T-Coding
- To examine the effect of T-Coding on the other components of language
- To compare T-Coding with other vocabulary learning strategies in acquiring productive knowledge of foreign words.

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