

Cognitive Strategies of Encoding, Storage, and Retrieval of Lexicon Popular Techniques Applied by Iranian French Language Learners

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Abstract

This paper aims to present the results obtained in a survey whose objective was to investigate the Iranian French language learner's definition of memorization, and the techniques they adopt most frequently in memorizing linguistic structures and vocabulary. The results indicate that although memorization plays a significant role in learning a foreign language, it is often neglected or understated. Memorization techniques are known to be rather individual, but it is suggested that weak learners can be encouraged to replace old techniques with more effective ones that could pave the way to a profound and stable learning.

Keywords: learning, memorization, memory, vocabulary, foreign language teaching

1. Introduction

In education and teaching of foreign languages, memorization techniques refer to a set of operations employed by the learner to encode the target language and to store it in their long-term memory for future retrieval. Research on memorization techniques has considerably improved the way a foreign language is taught in recent decades (Rubin, 1975, 1981). As a result of these studies we are better informed about the role of the learners and different cognitive factors influencing the learning process of a foreign language.

Application of effective memorization techniques in learning French language among Iranian students helps facilitate their learning process. Moreover, it is crucial for the Iranian teachers to recognize the significance of memorization techniques to be able to direct their teaching to a more learner-centered approach, by a better understanding of students' learning processes. Memorization, a cognitive learning strategy which embraces the whole process of encoding, storage, and retrieval of the information, is the subject of this research and plays a noteworthy role in learning a foreign language.

The part memorization techniques play in the development of language learning was further emphasized after the results of a research by Joan Rubin had been published in 1975. Decades later, *What the "Good Language Learner" Can Teach Us* was praised by Cohen and Macaro (2011) as the one research which could be regarded as the announcement of the birth of language learner strategy research. Rubin's findings set out techniques and approaches employed by successful language learners and could be summarized as, on the one hand, processes which may contribute directly to learning such as clarification and verification, monitoring, memorization, guessing (inductive inference), deductive reasoning, and practicing and, on the other hand, processes which may contribute indirectly to learning such as creation of opportunities for practice and production task related to communication.

Cyr and Germain (1998) noted that memorization is all that makes a difference between students with learning difficulties and the ones who do not show any sign of difficulty. Other researchers worked along similar lines. For instance, Macaro (2001) listed a cluster of five strategies from the Lingua project as "a definite conscious effort to commit language to memory" which range from simple repetition of words to turning "language into songs, rhymes, raps or mnemonics".

Table 1 resumes O'Malley and Chamot's (1990) and Rubin's (1981) classification of memorization strategies.

Table 1. O'Malley and Chamot's (1990) and Rubin's (1981) classification of memorization strategies

O'Malley and Chamot (1990) (Reproduced by Brown, 2007)	Rubin (1981) (Reproduced by Brown, 2007)
Memorization Strategies:	Memorization Strategies
. <i>Cognitive Strategies</i>	. <i>Direct Strategies</i>
- Practicing	- Application of rules
- Revising	- Repetition
- Memorizing	- Self-correction
- Elaborating	- Imitation and attention
- Repeating aloud	- Self-assessment
. <i>Metacognitive strategies</i>	- Memorization techniques
- Anticipation	. <i>Indirect Strategies</i>
- Attention	- Paraphrasing
- Self-assessment	- Miming
- Self-management	- Gestures
- Identifying the problem	- Using synonyms
- Self-regulation	

As a result of individual differences in brain cognitive operations, every individual activates their knowledge in a different way. Therefore every individual develops their own memorization techniques in the process of learning a foreign language. However, information on memorization techniques will help teachers and learners to develop the most appropriate strategies in learning foreign languages. Due to practical restrictions, the sole focus of this study is on cognitive strategies of memorization.

Memory is most commonly defined as the retention of information for future use, and has triggered researchers for centuries since it has to do with our daily lives. There has long been a tendency in psychology to distinguish between forms of memory based on duration, that is to say whether the information is of ephemeral or of long-lasting nature (Roediger III, 2008). Today, three general types of memory are recognized: sensory memory, working memory, and long-term memory.

Sensory memory, alternatively called sensory register, is "where essential information is extracted from the mass of stimuli coming into brain" (Randal, 2007). It is estimated to last up to half a second and cannot be prolonged (Chanquoy et al., 2007). The two main types of sensory memory are iconic and echoic memory, which deal with visual and auditory stimuli respectively.

Short-term memory, or as it was once called primary memory, is where the selected material is further processed (Randal, 2007). It might take up to 20 seconds before the registered or recalled information present at the short-term memory totally fades out. It is in fact because of its function of registering from the sensory memory or recalling from the long-term memory that it has come to be called the working memory. The size of the working memory has been measured to be limited to 7 ± 2 chunks of information (Chanquoy et al., 2007). The three primary components of the working memory are the phonological loop, the visuospatial sketchpad, and the central executive (Baddeley, 1986). The phonological loop allows the storage and rehearsal of verbal information. The visuospatial sketchpad, similarly, does the same with visual and spatial patterns. The central executive regulates the operation of the other two components.

The long-term memory, also known as the permanent memory, "contains information about the world, from our experiences about language and shapes (the Semantic Memory), the cumulative experiences which we have had in life (the Episodic Memory) and the automatic procedures involved in skilled behaviors (the Procedural Memory)" (Randal, 2007).

All the three main types of memory are of course involved in the process of memorization and cognitive memorization techniques rely heavily on the flow of information to and from the long-term memory. Nevertheless, memorization is severely hindered by forgetfulness.

According to Pavicic (2008), “learning of lexical items is not linear” and forgetting some components of knowledge is inevitable, whether they are stored in long-term or short-term memory. The rate at which one forgets, according to Thornbury (2002), is about 80% within 24 hours of learning, but it then slows down and levels out. He maintains that learners forget words either because there is interference from newly-learned material or they underestimate the role of recycling words. In addition, difficult words are expectedly more prone to being forgotten. A word might be difficult for a learner to remember if it contains sounds that are non-existent in their mother tongue, or if its pronunciation mismatches the spelling. Long words also tend to be more volatile. Furthermore, it has been shown that if a word is learned deliberately, as opposed to incidentally, it is less likely to be forgotten (Nation, 2006). Despite all that has been said, some techniques have been suggested to fight attrition of lexical items.

Learners of a foreign language, as well as native speakers, resort to some sort of mental visualization of the written form of the word when making an attempt to store or retrieve it to or from the long-term memory. This is likely to be true for most visual learners, though the extent to which that mental representation of the written word is correctly spelled varies greatly from learner to learner.

However, in case of auditory learners, or even when a visual learner does not know the spelling of the word – and this is not as rare as one might expect – what Hudson (2000) calls “our mental dictionary” comes into play. He suggests that among other ways, we access words listed in our mental dictionary by their:

- a) rhyme; that is when we store and then retrieve a word based on the rhyme it has with another word already known to us (existent in our mental dictionary). For instance, we can remember bunny because it rhymes with funny.
- b) initial sound; that is when we try to remember a word by first trying to remember the sound it starts with, which triggers our brain to remember the following sounds.
- c) synonym; that is to say that a word can be remembered by first remembering a simpler synonym we had already learned.
- d) rough opposites; that is to say that a word can be remembered by first remembering its simpler opposite we had already learned.
- e) other semantic features; that is the association of words with names of animals, colors, ice-cream flavors, etc. For example, the word blueberry might be retrieved by remembering the color blue.
- f) context of occurrence; that is storing or retrieving a word by thinking of the physical place where it might be found. For instance, one may think of a kitchen where a *skillet* is found.
- g) part of speech; that is when one classifies the entries of their mental dictionary in categories such as noun, verb, etc.
- h) spelling; that is remembering the initial letter or letters of a word in an attempt to retrieve it.

We would like to emphasize the above-mentioned ways are commonly applied by learners of a language as well as native speakers and that a combination of these techniques might play a part when trying to store or retrieve words.

Concerning cognitive strategies of memorization, they involve an interaction between the learner and the material being studied, physical manipulation of the target language and applying specific techniques in order to solve a problem or undertake a learning task. (Cyr & Germain, 1998)

Cognitive memorization techniques include, but are not limited to practicing, memorizing, grouping, elaborating and active recitation which play a significant role in information storage and retrieval and contribute greatly to efficient memorization.

Practicing a language means repeating language segments, thinking or talking to oneself in the target language, testing or using words, sentences, or rules that students learned in the class in real life communication.

Memorizing consists of applying mnemonics, repetition, categorization, note taking, contextualizing, etc.

Revising is repeating and reviewing the previously learned language in the process of time to the extent that its retrieval becomes automatic.

Elaborating makes it possible for knowledge to be reorganized in the long-term memory. Elaboration can involve associating new pieces of information to the concepts already in the memory. “This allows students to work out the meaning by drawing analogies spotting explicit links between the written text or utterance and their knowledge”. (Cyr & Germain, 1998)

Summarizing is to make a mental or written summary of a rule or a new point in a task that leads to memorization. In this respect, the teacher can play a major role by reviewing his objectives or the lessons taught in the class.

Active recitation or loud recitation consists of answering questions and checking what has been retained in the process of learning. It facilitates learning because it makes the learner participate actively in the learning and helps the learner to check their own progress and errors.

Having said all that, memorization involves making use of cognitive and metacognitive approaches. Considering the diversity of techniques and strategies, it seems that every person has their own way of memorizing words, that is to store them to their long-term memory and retrieve them if need be. There is, of course, no single memorization technique that might work for all students alike, but it is important to find the prevalent techniques among students learning a foreign language. In this paper, we aim to address the issues of:

- 1) how Iranian students define memorization in learning a foreign language;
- 2) the cognitive memorization techniques applied most frequently by Iranian students in learning linguistic vocabulary and structure of the French language

2. Method

2.1 Subject Characteristics

Seventy five adults of both sexes were randomly selected from three language schools in Tehran, Iran. The participants were all Iranian learners of French as a foreign language and ranged from beginner to upper-intermediate. The purpose of the study was clearly explained to them. The questions and the questionnaire were all in Persian, the participants' mother tongue.

2.2 Procedure

A common way to unveil what is going on underneath the conscious layers of the mind is to ask people what they think they are doing. Questions of the type "how do you try to remember recently-learned vocabulary?" can be an example. The answer, however, may not accurately reflect what people actually do, since so much of our linguistic behavior is subconscious and not available to our conscious minds.

To this end, a set of yes/no, open-ended, and multiple-choice questions as well as a questionnaire (table 2) were developed to investigate the aforementioned issues.

Table 2. The questionnaire used in this study investigating the memorization techniques most frequently applied by Iranian students

	Rarely	Sometimes	Often
1. I try to find different ways of practicing French.			
2. I look for occasions to read in French as much as possible.			
3. I try to find people with whom I can speak French.			
4. I speak French to myself.			
5. I answer the teacher's questions even if they are not addressed to me.			
6. When I learn a new word or expression, I repeat them out loud to myself.			
7. When I look up a word in the dictionary, I pronounce it out aloud.			
8. I note down the new words and their meaning in a notebook.			
9. I review my French lessons regularly.			
10. I associate what I already know to the new things I learn in French.			
11. I use the new words I learn in a sentence in order to be able to remember them later more easily.			
12. I look for or notice the words in my mother tongue which resemble those in French.			
13. When I look up a word in the dictionary, I read the examples clarifying the usage of the word.			

14. I remember a newly-learned word by visualizing a situation in which it can be used.

15. I try to comprehend the meaning of a French word by dividing it into parts I can recognize.

16. I try not to translate word by word.

In order to address the first issue, students were asked to complete the following open-ended questions:

A: To me memorization is ...

B: Memorization is good for ...

However, since, expectedly, they did not mention any memorization techniques in their answers, we provided them with clearer ideas on memorization by offering the following suggestions:

In order to memorize, it is indispensable to:

- 1) recite several times
- 2) comprehend (what the new word means, specially applicable to abstract terms)
- 3) be interested in what I'm memorizing
- 4) be able to use what I have memorized

In order to determine the memorization techniques used most frequently, the subjects were asked to complete the questionnaire.

Students were also asked to reply to the following questions with "yes" or "no":

- 1) Do you highlight important words in color?
- 2) Do you write down what you want to memorize?
- 3) Do you make summaries?
- 4) Do you take note of the most important points?
- 5) Do you make plans?
- 6) Do you make diagrams?
- 7) Do you repeat aloud what you want to memorize?
- 8) Do you read several times in order to memorize?

3. Results

The subjects' responses to the open-ended sentences (students' definition of memorization) revealed the following results:

To me, memorization is...

1. 9.5 % of the students find memorization evocative of universities and institutes.
2. One or several verbs are used to describe memorization. These verbs can be categorized under four strategies of cognitive information processing: receiving (4%), processing (20.5 %), using (35.5%), and retaining (27.5%).
3. 24.5 % of the students consider memorization as learning.
4. For 13.5 % of the students, memorization consists of retaining information. To 9.5%, retaining was found to mean retrieving information.

Respondents who completed the sentence: "memorization is good for..." can be categorized as follows:

1. 29 % of the respondents pointed out the usefulness of memorization in reusing information.
2. 57.5 % of students consider it useful for personal improvement. To them, memorization is cognitive development; exercising one's memory (16.5%), comprehension (16%), remembering (13.5%), retaining (8.5%), knowing (1.5%), and expressing oneself (1.5%).
3. 7% of the students consider memorization to be useful in that it offers immediate access to information.

Interestingly, 12.5% of the respondents gave no credit to memorization in language learning process. This reveals that our students have not been given adequate information on memorization although 57.5% of the

learners have been found to have some knowledge about cognitive development and information processing. However, since they had not mentioned any memorization techniques in their answers, we offered some suggestions providing them with clearer ideas on memorization:

In order to memorize, it is indispensable to...

1. recite several times (48% YES)
2. comprehend (94 % YES)
3. be interested in what I'm memorizing (71.5 % YES)
4. be able to use what I have memorized (68.5% YES)
5. find personal interest (54% YES)

Figure 1 summarizes and compares the students' responses to the questions above.

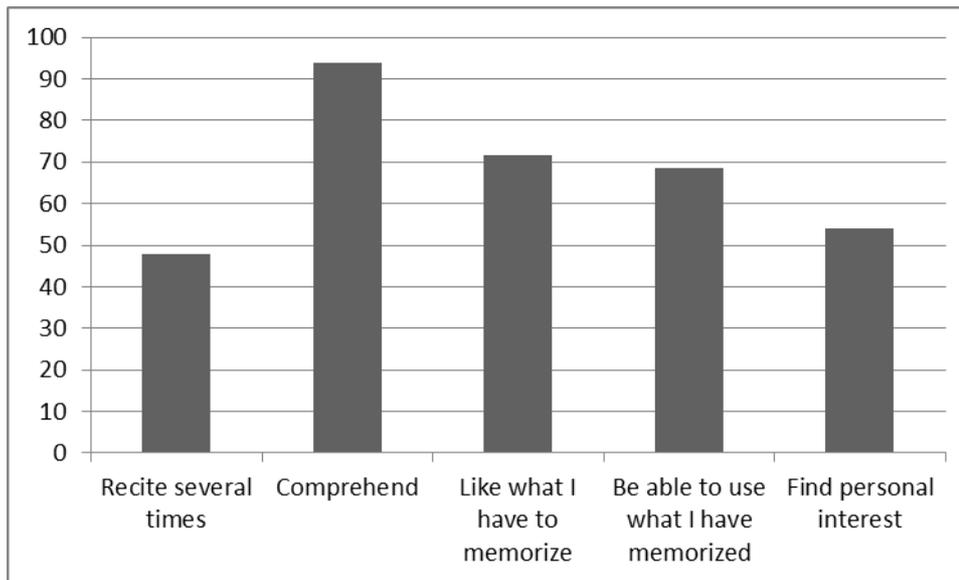


Figure 1. Percentage of the subjects' affirmative responses to the questions regarding indispensable factors of memorizing

As it can be observed, 94% of the students maintain that comprehending the meaning is necessary for memorization in the sense that more abstract words are less likely to be remembered if the learner does not grasp the concept. However, 48% believe that mere comprehending is not sufficient for learning. They believe that reciting several times is a must in memorization.

The findings also show that being able to reuse the memorized information is indispensable for more than half of the students (68.5%), but finding a personal interest in what is being memorized is deemed unnecessary for nearly half of the students. On the other hand, motivation seems to be a prerequisite to memorization with more than 70% of the subjects stating that they would be more likely to remember those words whose meaning interests them.

The researchers also tried to find about the memorization techniques most frequently used by Iranians learning French, so as to figure out how they proceed to memorize the structures of a foreign language. To this end, the students were given a questionnaire concerning different memorization techniques believed to be the most widely practiced (Table 2). The results are shown in figures 2 to 17.

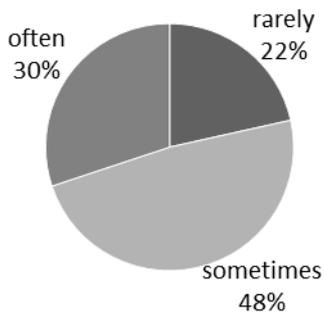


Figure 2. I try to find different ways of practicing French (practicing technique)

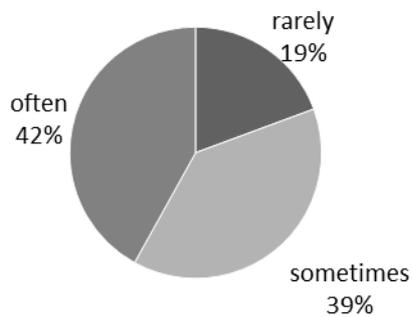


Figure 3. I look for occasions to read in French as much as possible (practicing technique)

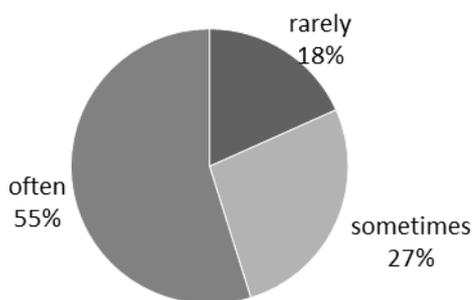


Figure 4. I try to find people with whom I can speak French (practicing technique)

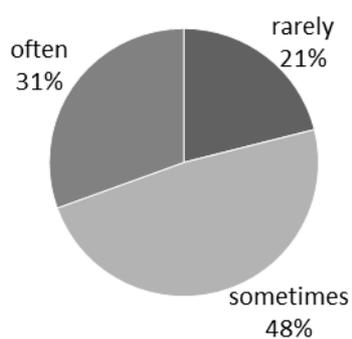


Figure 5. I speak French to myself (practicing technique)

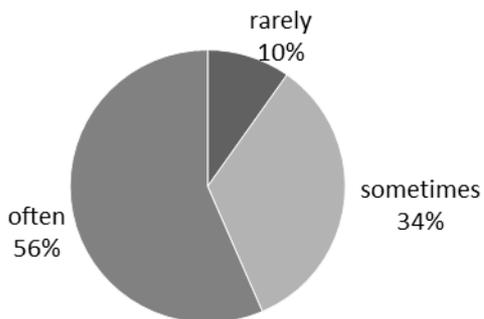


Figure 6. I answer the teacher's questions even if they are not addressed to me (recitation technique)

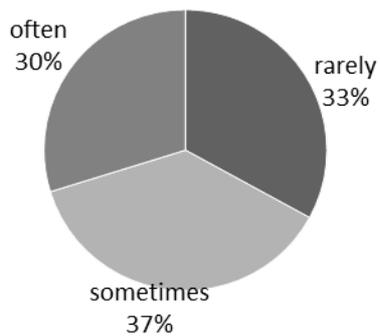


Figure 7. When I learn new words or expressions, I repeat them out loud to myself (recitation technique)

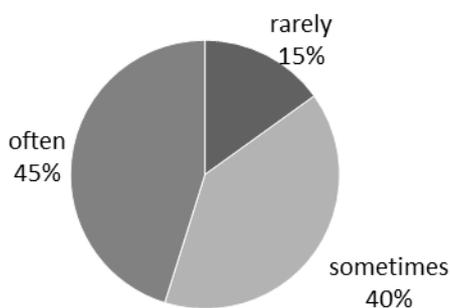


Figure 8. When I look up a word in the dictionary, I pronounce it out aloud (recitation technique)

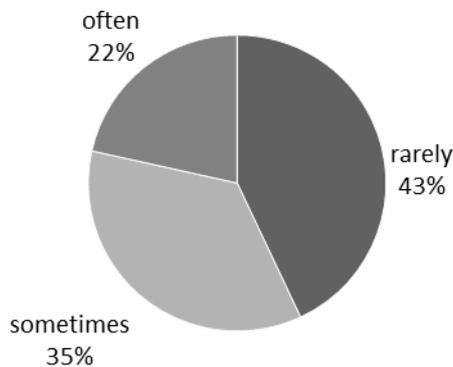


Figure 9. I note down the new words and their meaning in a notebook (revision technique)

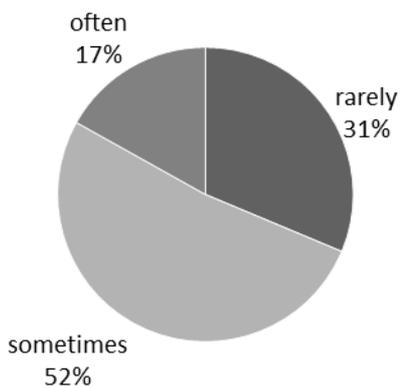


Figure 10. I review my French lessons regularly (revision technique)

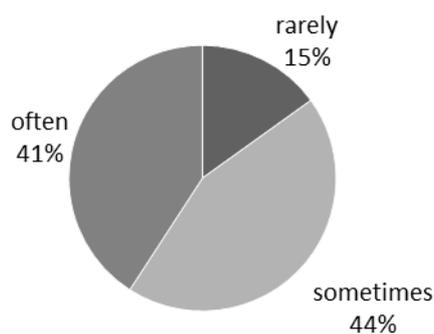


Figure 11. I associate what I already know to the new things I learn in French (elaboration technique)

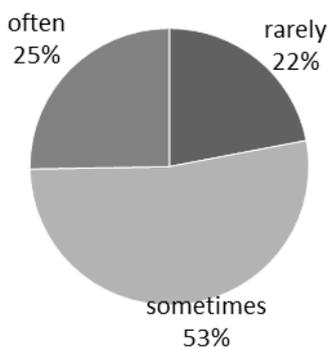


Figure 12. I use the new words I learn in a sentence in order to be able to remember them later more easily (elaboration technique)

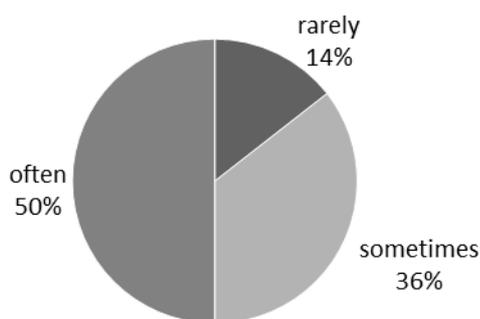


Figure 13. I look for or notice the words in my mother tongue which resemble those in French (elaboration technique)

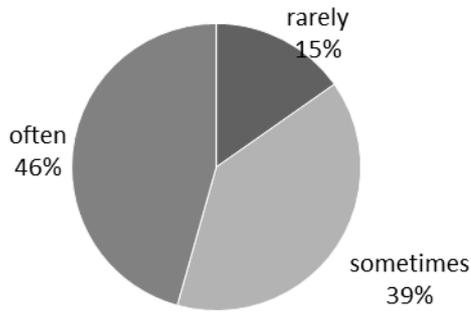


Figure 14. When I look up a word in the dictionary, I read the examples clarifying the usage of the word (referring to the sources technique)

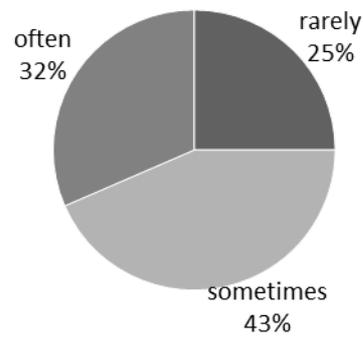


Figure 15. I remember a newly-learned word by visualizing a situation in which it can be used (visualization technique)

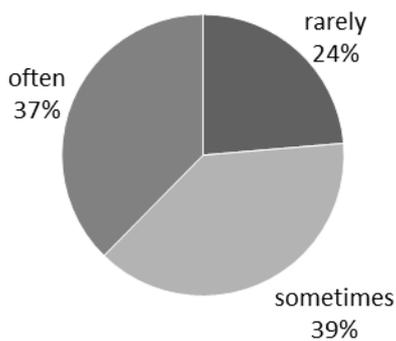


Figure 16. I try to comprehend the meaning of a French word by dividing it into parts I can recognize (segmentation technique)

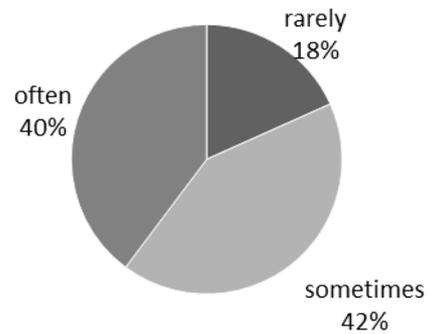


Figure 17. I try not to translate word by word (refusing to translate technique)

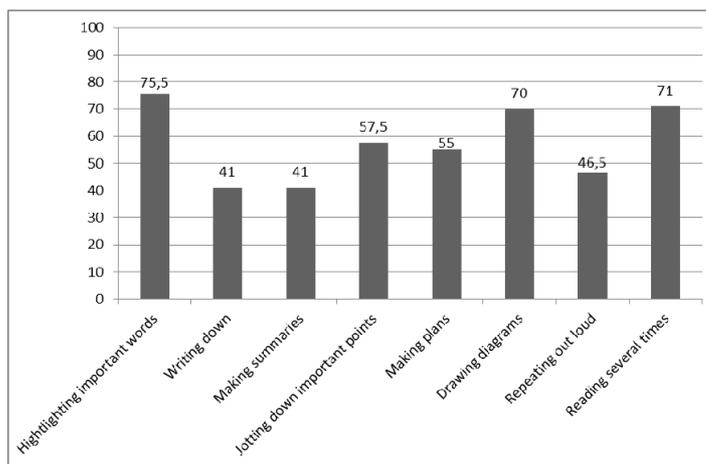


Figure 18. Prevalence of memorization techniques practiced by Iranian French learners

Respondents were also invited to answer some yes/no questions to determine the extent to which various memorization techniques are actively used. The obtained results are shown in figure 18. All of the numeric data are in percentage terms.

4. Discussion

Results of this study indicate that Iranian students neglect the importance of memorization and memorization techniques in learning foreign languages. Therefore, the teachers' role in encouraging students to use memorization techniques in the class is of utmost significance.

As illustrated, figures 2 to 5 depict the subjects' application of practicing techniques to the purpose of memorizing. It seems that Iranian students ignore practicing outside the classroom. This may partly justify why many learners complain about making slow progress. As students leave the class, they will have very dismal chances of receiving L2 input and mother tongue will dominate until the next class. Therefore, the teachers must encourage students to recycle the newly-introduced words at certain intervals using a variety of tasks ranging from the mere mechanical repetition to productive use of words. (Pavičić Takač, 2008)

Figures 6 to 8 show the students' application of the recitation technique to the purpose of memorizing.

Teachers are advised to encourage students to be accustomed to recitation. Repetitions must be an integral part of class activities to improve students' memorization process. Figures 9 to 17 show the prevalence of the application of revision, elaboration, referring to sources, visualization, segmentation, and refusing translation techniques among the subjects.

Reviewing lessons at home needs to be encouraged by teachers by assigning homework that is related to the subject of the study in the class, and regular monitoring of the assignments by the teacher must be set as a rule in the class environment. Moreover, introducing new words in the context by the teacher would encourage students to contextualize the words that they learn.

Using the mother tongue in the class, especially in the beginner levels, to the point of avoiding confusion seems to be inevitable. However, teachers must be aware of the dangers of translation in the class as it may become a regular orientation of the students whose approach towards foreign language learning is based on "equivalence hypothesis" (Pavičić Takač, 2008). The authors suggest that teachers resort to techniques that will eliminate the need for translation. They can, for instance, mime the meaning of a word, a technique which is known to have reinforcing effects on the memorization of lexical items (Tellier, 2010) or use online image search services, if the technical equipment of the classroom permits, especially to convey the meaning of concrete words.

We have attempted to show that there has been a variety of strategies for memorization. The most prevailing one among Iranian learners is comprehending allocated meaning and the rarest is found to be regular revision.

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