

The Effectiveness of Translation, Image-based and Video-based Methodologies for Receptive and Productive Vocabulary Acquisition

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Abstract: The aim of this study is to analyse and compare three different methodologies (glossed L1 translation, image-based and video-based) for vocabulary learning taking into account the two kinds of vocabulary knowledge: receptive/passive and productive/active. The participants were 52 high school students aged 12 to 15, who were exposed to all the methodologies. The instruments employed for this research were a pre-test to check previous knowledge, three post-tests, one for each methodology, which were administered immediately after the treatment and a week later, and a questionnaire. The results indicate that the image-based methodology seems to be the most effective in terms of immediate and delayed recall, while all three methodologies are equally effective for receptive vocabulary knowledge, and translation and the image-based methodology slightly better for productive. Even with similar quantitative results, students expressed a greater preference for the image-based methodology.

Keywords: Vocabulary learning; receptive and productive vocabulary; image-based vocabulary learning; video-based vocabulary learning.

Resumen: Este estudio analiza y compara tres metodologías de aprendizaje de vocabulario (traducción en la L1, imágenes y videos) teniendo en cuenta los dos tipos de conocimiento de vocabulario: receptivo/pasivo y productivo/activo. Los participantes fueron 52 alumnos de escuela secundaria con edades de 12 a 15 años y expuestos a las tres metodologías. Los instrumentos que se utilizaron fueron un pre-test para analizar conocimiento de vocabulario previo; tres post-tests, uno para cada metodología, y administrados inmediatamente después de cada tratamiento y una semana más tarde; y un cuestionario. Los resultados indican que la metodología basada en imágenes parece ser la más efectiva tanto inmediatamente después del tratamiento como una semana después, y que las tres metodologías son igualmente efectivas para el aprendizaje de vocabulario pasivo, pero la traducción y la metodología basada en video son ligeramente mejores para el vocabulario productivo. También se observa que los alumnos prefieren la metodología basada en la imagen.

Palabras clave: Aprendizaje de vocabulario; vocabulario receptivo y productivo; aprendizaje de vocabulario con imágenes; aprendizaje de vocabulario por video.

I. Introduction

The pervasiveness of Information and Communication Technologies (ICT) has affected teaching and learning processes starting a second revolution in the world of education (Collins & Halverson, 2010). Vocabulary acquisition, which is an important part of the process of learning foreign languages, has also been influenced by the extensive use of ICT. Exposure to abundant multimedia input can modify vocabulary learning (Hu & Deng, 2007), which was almost limited to traditional glossed L1 translation lists in the past.

In the last few years, some researchers have studied the impact of these new multimedia materials in L2 learning (Elgort, 2018; Hu & Deng, 2007; Jones, 2004) taking into account the kind of multimodal input they provide, which usually includes audio and visual input, and in some cases also annotations. Although there have been some studies which have investigated the impact of using different types of input and their combination on vocabulary acquisition, to the best of our knowledge, there is no research that has considered such effect in the receptive and productive stages of vocabulary acquisition. Studies analysing receptive and productive vocabulary acquisition have traditionally used translation methodologies (Griffin & Harley, 1996; Mondria & Wiersma, 2004; Schneider et al., 2002; Stoddard, 1929; Waring, 1997), and have ignored new kinds of input. Therefore, our aim is to compare the effectiveness of a traditional L1 translation methodology to two new kinds of input (image-based methodology and video-based) in receptive and productive vocabulary acquisition.

This paper starts with a revision of previous studies dealing with the receptive and productive stages of vocabulary acquisition, and with the effect of using new kinds of input provided by ICT. Secondly, the research questions and the methodology followed to collect the data are provided. Finally, the results are presented and discussed, and conclusions are drawn together with some pedagogical recommendations.

II. Literature Review

Although vocabulary acquisition was neglected for many decades until it came to the foreground as an important aspect of language learning in the 80's (Meara, 1980), it is recognized as an essential element when learning a second or foreign language. Appropriate lexical knowledge is more needed than grammatical knowledge to be able to communicate successfully and for the acquisition of a second language (Alqahtani, 2015).

Some authors (Krashen, 2004) have postulated there is a distinction between the terms acquisition and learning. The former has been described as a subconscious and intuitive process of building the system of a language similar to the way in which children develop their first language, while the latter has been identified as a conscious process, in which learners attend to form, figure out rules, and are aware of their own learning. Nevertheless, other authors have observed the difference is not so clear cut. For example, Carter and McCarthy (2014) refer to language learning as a process towards acquisition, which is the end result. Regarding vocabulary, these authors consider that a second language (L2) word has been acquired when a learner can recognise and understand its meaning both in isolation and in context, and when the term can be used naturally and appropriately in different situations. As the purpose of this research is not to distinguish between whether a term is learnt or acquired, these two terms will be used as synonyms.

Research on vocabulary acquisition has defined two different stages in the process, which have been called receptive and productive vocabulary knowledge, or passive and active vocabulary respectively (Pignot-Shahov, 2012). Receptive vocabulary or passive knowledge is usually associated with receptive skills (listening and reading), and it refers to the knowledge learners have when they are able to identify an item of vocabulary. On the other hand, productive or active vocabulary is usually associated with productive skills (writing or speaking) meaning that learners are able to produce and use appropriately that item of vocabulary (Laufer & Goldstein, 2004). In other words, receptive knowledge of vocabulary is to be able to recognise or understand words in their spoken or written form, and productive knowledge of vocabulary means to be able to use a word correctly in written work or speech (Pignot-Shahov, 2012). Throughout the learning process, receptive knowledge precedes productive knowledge (Carter & McCarthy, 2014).

Vocabulary learning research has compared both kinds of L2 vocabulary learning. For example, Stoddard (1929) conducted a research aimed at learning some French words with American high school students with no knowledge of French. Two groups were created, half of the students were taught the French (L2) word with the corresponding English (L1) translation, and the other half the English word with the corresponding French translation. He called those two conditions: receptive vocabulary learning and productive vocabulary learning. The former meant focusing on the L2 words using the L1 translation (L2 to L1), while the latter focused on the L1 and provided the equivalent in the L2 (L1 to L2). After the treatment, he administered an immediate retention test to analyse receptive and productive knowledge. The test was identical for

both groups, and tested the receptive knowledge of half of the words, and the productive knowledge of the other half. The results showed that receptive word recall was significantly higher than productive word knowledge, and that the group that learned the words receptively had the best scores on the receptive part of the test, while the group that learned the words productively outperformed the other group on the productive part. Productive learning produced a considerable amount of receptive knowledge and receptive knowledge produced a considerable amount of productive knowledge.

In line with Stoddard (1929), Griffin and Harley (1996) conducted a similar research. The participants in their research were high school students in their first year of learning French. Two groups were made and half of the students were taught the French word with the corresponding English translation (receptive vocabulary learning), and the other half the English word with the corresponding French translation (productive vocabulary learning). Half of the students of each group were tested receptively and the other half productively. These students did an immediate test and 3 delayed tests. The results showed that receptive learning produced a considerable amount of productive knowledge and productive knowledge of receptive knowledge. Equivalent learning condition and type of test (for example receptive learning and receptive test) showed better results than non-equivalent condition and testing. Total retention (receptive and productive knowledge together) showed no significant difference between productive and receptive learning, and both types of learning decreased their total retention rates similarly.

Waring (1997) conducted an experiment similar to Stoddard's (1929) experiment. A group of students were taught a set of vocabulary receptively (L2 to L1) and another set productively (L1 to L2). The knowledge of the sets was tested right after treatment, the following day, one week later and three months later. The results showed that the receptive tests produced higher scores than the productive tests, that receptive learning produced a considerable amount of productive knowledge and productive knowledge produced a considerable amount of receptive knowledge, and that the best results were obtained by the group who had learnt the words in the same condition as it was tested. He also noted that the receptive learning process is faster than the productive learning process.

Schneider, Healy and Bourne (2002) carried out two experiments in which American college students also had to learn a set of French words. The students were divided into two different groups. One group learned the words receptively and did an immediate receptive retention test. The other group learned the words productively and did an immediate productive retention test. One week later, students were administered a delayed retention test. In this delayed

test, half of the students of each group were tested receptively and afterwards they had to relearn the words receptively. The other half of each group were tested productively and they had to relearn the words productively. The results showed that receptive retention tests (immediate and delayed) produced higher scores than immediate productive tests, that receptive learning produced a considerable amount of productive knowledge and vice versa, and that retention rates between the two tests (immediate and delayed) were higher for the words that were learned productively than for the words learned receptively.

All the aforementioned studies were carried out using translation as the means to learn vocabulary, which has been one of the most popular methods for vocabulary learning proving that the usage of L1 can be beneficial in the EFL classroom (Camó & Ballester, 2015). Nevertheless, the current spread and availability of technology has allowed for new ways of providing students with more authentic and real input. These new methodologies of vocabulary acquisition using multimedia input have been based on two theoretical frameworks, *The Dual-Coding Theory* (Paivio, 1971) and *The Cognitive Theory of Multimedia Learning* (Mayer, 2001), which have tried to explain the cognitive processes happening while learning vocabulary with audio-only input, visual-only input and multimedia input.

The Dual-Coding Theory was presented by Paivio (1971) and hypothesized that memory and cognition were assisted by two separate systems: one deals with verbal information such as words and symbols, and the second one is specialized in non-verbal information such as pictures and objects. When an individual learns a language, the brain is able to distinguish between verbal and non-verbal representations, and the interconnection between both systems makes it possible to link words and images. For this reason, learners will acquire more efficiently and will retain more information if both systems are activated during the learning process.

The Cognitive Theory of Multimedia Learning was an evolution of the approach, which referred to multimedia learning, and was presented by Mayer (2001). According to this theory, the learning process was divided into three steps: the first stage is the selection of verbal and visual information from the multimodal input; the second stage is the selection of relevant information, verbal and visual, from that multimodal input; and the third stage is the integration of both visual and verbal representations with each other. From this theory, we can infer that the learning process occurs when those verbal and visual representations are built in the brain. Both of those theories suggest that learners will obtain higher benefits when they receive both textual and visual input (Paivio, 1971; Mayer, 2001). With the help of new technologies, the learning of vocabulary using visu-

al and audio-visual input linked to textual representations can be easily implemented in the EFL classroom. The effects of different kinds of visual elements as compared to translation on new vocabulary acquisition has also been investigated. For example, Hashemi and Pourgharib (2013) focused on how to improve vocabulary learning by using visual materials such as pictures, real objects and flash cards. They conducted a research with 39 female students divided into two groups, an experimental and a control group. In the experimental group, new vocabulary was taught using visual elements and, in the control group, they were instructed using translation. The results of this research showed that the students who learnt vocabulary using visual materials had a better learning and retention.

Current research has also shown that the usage of video input, especially in early stages of learning, seems to be beneficial for vocabulary acquisition (Sydorenko, 2010). In the same line, some research appears to demonstrate that the usage of audio-visual materials instead of only-audio listening is more effective in terms of retention immediately after exposure (Gomez Pastor, 2013). This type of input (image and audio) appears to be even more efficient than a combination of image and text for learning unknown vocabulary. This can be because video appears to help to create a mental image of new vocabulary (Al-Seghayer, 2001) and, furthermore, the usage of non-verbal referents attached to new elements of vocabulary when learning a new language seems to create more efficient associations (Talaván, 2007).

The effectiveness of different types of input for vocabulary acquisition has also been explored. For instance, Al-Seghayer (2001) analysed whether any of four different kinds of input (text, graphics, video and sound) were more effective for vocabulary acquisition. For this study, 30 English as a Second Language (ESL) university learners coming from different countries and with different L1 were selected. They were given a narrative text in English with annotations for target words. The annotations were hypermedia links to four different input modalities (text, graphics, video and sound). In order to assess the effect of each mode, recognition and production tests were administered. Their results suggested that a video clip combined with a text definition is more effective than a picture in combination with a text definition, as participants could recall more words when learnt with videos than when learnt with pictures (images).

In line with Al-Seghayer (2001), Mashhadi and Jamalifar (2015) conducted a research with the aim of comparing the effect of visual and textual representations on vocabulary learning. For this study, the authors selected 100 Iranian EFL learners from a local high school. Before the study, the learners' previous knowledge was tested. They created a control group where students learnt vo-

cabulary using a translation methodology; a second group, called the input-enhancement group, where the lexical items were in bold and were translated into Persian language; and a third group provided with a variety of visual flashcards, pictures, videos and semantic maps. After the process, the students did a post-test that was compared to the pre-test. This research found that the students in the visual group outperformed students in both the enhanced-input group and the control group.

In a similar line, Jones (2004) conducted a research with the aim of testing L2 vocabulary recognition and recall using pictorial and written items. In Jones' article, two experiments which examined the effects of pictorial and written annotations on L2 vocabulary learning from a multimedia environment were described. In both studies, four groups were created: one control group, one group with written annotations, one group with pictorial annotations, and one group with both written and pictorial annotations. The results showed that the three groups that received annotations had better results than the control group, and that the students did better when the mode of testing was the same as the treatment condition.

Gómez Pastor (2013) also conducted a research on the usage of videos for vocabulary acquisition. In this study, the results of teaching using audio-visual material and listening materials for vocabulary development were compared. The recognition method, written words vs. images, was also taken into consideration. This research was carried out with a group of 16 students that were divided into two smaller groups, the experimental group and the control group. First, a pre-test was administered in order to create a corpus of unknown items. After the treatment, which consisted in splitting the group into two - A and B - where the A group watched a video twice and the B group just listened to the audio of the same video, a post-test was given to students. The post-test was implemented three times: the first time immediately after the treatment, the second time after two weeks, and the third time after four weeks, in order to check retention rates. The results of this research showed that the usage of audio-visual materials instead of only-audio listening was more effective in terms of retention immediately after exposure. Nevertheless, the positive effect was not sustained in time because both groups did equally well in the last post-test 4 weeks after the treatment.

Some research has investigated students' perceptions about these new methodologies. For example, Filgueira Garro (2014) conducted a research where students expressed their opinions about the usage of videos for learning vocabulary. In this study, she administered students a survey where they expressed their perceptions and a 70% of the students perceived this methodology as helpful

to learn specific vocabulary. Winke, Gass, and Sydorenko (2010) confirmed this view as the participants in their study felt that the audio-visual format with the help of captions had reinforced their learning.

Even though the majority of studies have supported that video seems to be more beneficial for vocabulary retention, there have been some classroom studies that seem to point out that image might be as beneficial (Mashhadi & Jamalifar, 2015). Consequently, given the fact that the most used methodology in secondary schools seems to be translation, that there is some controversy about whether video-based or image-based input is more effective for vocabulary acquisition, and that gains in vocabulary have not been explored taking into account perceptive and productive vocabulary learning, it would be interesting to compare the effectiveness of those methods in a secondary school setting. So this study aims to compare the effectiveness of three different methods (glossed L1 translation, image-based and video-based) on the acquisition of receptive and productive vocabulary in an English as a Foreign Language secondary school classroom, a context where research on vocabulary acquisition is not abundant.

Consequently, the following research questions guided the current study:

1. Is video assisted vocabulary learning more effective than image assisted or glossed L1 translations? Do any of these techniques imply a better immediate recall and a better delayed recall?
2. Are there any differences regarding receptive and productive vocabulary learning?
3. Do EFL learners perceive these methods as positive? What type of vocabulary learning do they prefer?

III. Method

1. *Participants*

The sample used in this study comprised a total of 52 students aged 13 to 15 in a public high school in Pamplona (Spain). These students belonged to a bilingual education program in English. This means they had been taught half of their school subjects in English and English language as a subject during their years in primary school. In high school, they were also being taught between three and four subjects in English and English as a subject.

For organizational purposes, three intact groups of learners with 20, 15 and 17 learners in each group were administered the treatments. These groups be-

longed to different years in secondary education: one group belonged to 1st of ESO, which is the first year of secondary education, one to 2nd of ESO and one to 3rd of ESO. The language level of these groups was quite homogeneous ranging from A2 to B1.

2. *Materials and instruments*

For the treatment, three different approaches to vocabulary acquisition were used: glossed L1 translation, image-based material and video-based material. Three different kinds of materials, one for each methodology, were presented to the three groups of students to teach them vocabulary. A variety of activities were designed for each method. For the glossed L1 translation methodology, a *HotPotatoes*¹ crossword containing fourteen words was designed. For the image-based methodology, a *Quizlet*² was made. And finally, for the video-based methodology, a *Kahoot*³ activity was created. The vocabulary was extracted from the students' course books in order to make the treatment as useful as possible to them and it consisted of adjectives of personality for the translation methodology, jobs around the house for the image-based methodology and animal life for the video image-methodology.

Five instruments were used to collect the data: an initial vocabulary test; a post vocabulary test for each set of words, that is a total of three vocabulary tests; and a questionnaire. The first vocabulary test was a pre-test in which the students had to match words and definitions. It included all the words in the three treatments (42 words) and it was designed to check students' initial knowledge of the words in order to rule out any word which might be known by a majority of students. The pre-test showed that the students did not know the words that had been selected, and, consequently, the treatments continued with those words.

The second vocabulary test was different for each set of words and it was used as the immediate and the delayed post-test and it was divided in two parts. The first part included a matching exercise designed to evaluate receptive/pas-

1. HotPotatoes is a software suite to create different types of exercises. Available at <https://web.uvic.ca/hrd/hotpot/>.

2. Quizlet is a webpage to create flashcards which also provides exercises to work with vocabulary. <https://quizlet.com/login>.

3. Kahoot is another webpage to create games and quizzes. <https://kahoot.com/b/>.

sive vocabulary acquisition and comprised seven words. The other seven words were included in a second part where the students had to produce them, so this part was designed to evaluate productive/active vocabulary. In order to make the post-tests similar to the treatments, the translation post-tests were based on matching and translating L1 words or phrases, and both image-based and video-based were tested by matching and defining pictures.

Finally, the third instrument was a questionnaire, which students answered once the treatments had been completed. The questionnaire had five questions: three multiple choice questions where students had to select their favourite methodology, the one they had thought made the vocabulary the easiest to understand, and the one they thought made it easier for them to remember the words one week later; a Likert-scale question rating comprehension perceived for each methodology from very easy to very hard; and two final open-ended questions, which enquired about the advantages and disadvantages of each methodology, and students' opinions about the whole process.

3. *Procedure*

The first step was to administer the pre-test to check initial knowledge the first week. Once the pre-test was done and it was shown that none of the words previously selected were known, the researcher implemented the three different methods in each group. During the treatment, some explanations were given when necessary in order to achieve appropriate understanding. For the glossed L1 translation method, the words were read and translated twice to students, stressing some important aspects such as false friends. For the image-based treatment, some explanations were given in order to make some clarifications. Finally, for the video-based treatment, some commentaries were made in order to indicate the exact moment in the video where the expected term would be shown.

Once the students had seen the new vocabulary, the activity designed for each method was done by students under one of the researcher's supervision. After they had done the activity, they did the immediate post-test. Before doing it, it was made clear that the test would not be used for evaluation purposes and that they had to do it on their own. This procedure was repeated one week later for the delayed post-test.

The method we used can be considered a cross-validation method because each method (translation, images and video) was tested in each group in order to

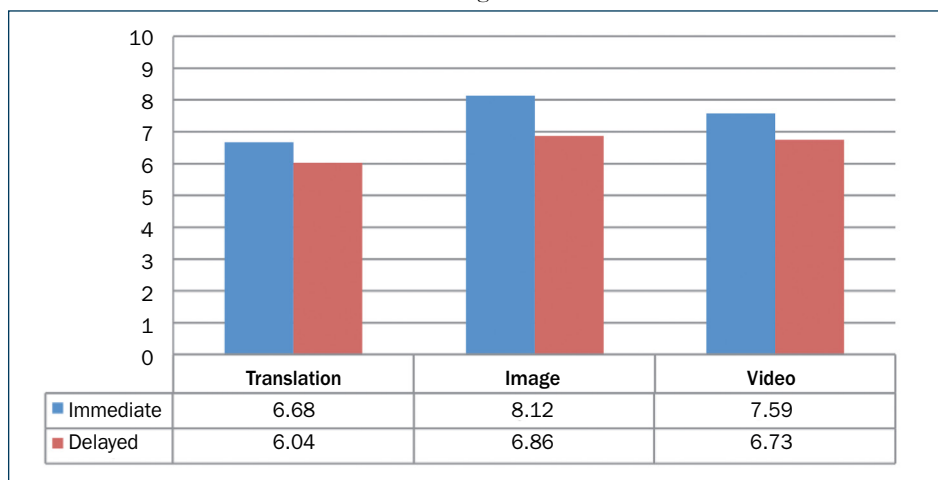
minimize any possible effect of group heterogeneity, or of any set of words being easier to remember for different reasons. To finish the data collection procedure, the questionnaire was administered.

IV. Results

1. General results by methodology

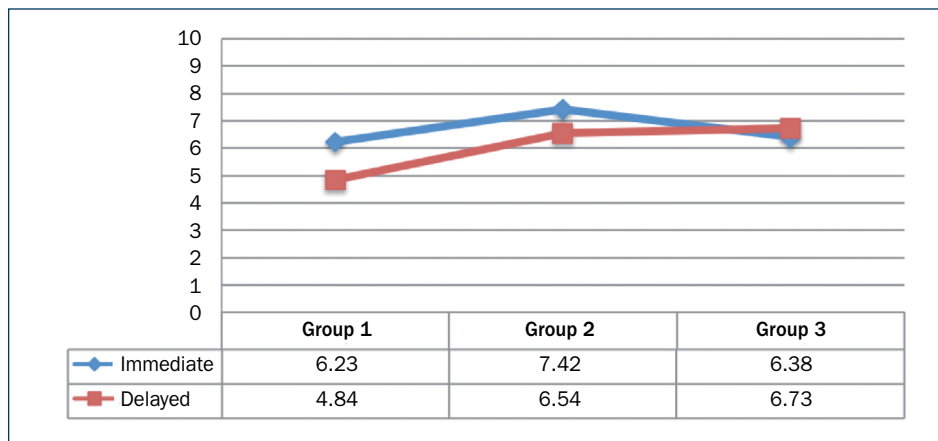
As can be seen in Table 1 and considering all the students, in the immediate post-test students scored 6.68 points out of 10 with the glossed L1 translation methodology, 8.12 points with the image-based, and 7.59 with the video-based. Regarding the delayed post-test, the results were 6.04 for glossed L1 translation, 6.86 for image-based and 6.73 for video-based. In summary, the best results corresponded to the image-based methodology in both the immediate and the delayed post-tests in contrast with the translation methodology that obtained the worst results in both tests. If we focus on recall, the method that had the biggest drop from the immediate post-test to the delayed post-test was the image-based methodology. This methodology underwent a drop of 1.26 points, from 8.12 points to 6.86. On the other hand, the translation methodology experienced the smallest drop, which was a 0.64 points drop, from 6.68 to 6.04. The video-based methodology had a drop of 0.86 points, from 7.59 to 6.73 points.

Table 1. Global results of the three methodologies



a) *Results of the glossed L1 translation methodology*

As can be seen in Graph 1, the results obtained with the translation methodology were 6.23 points for Group 1, 7.42 points for Group 2 and 6.38 points for Group 3 in the immediate post-test. The results in the delayed post-test were 4.84 for Group 1, 6.54 for Group 2 and 6.73 for Group 3.

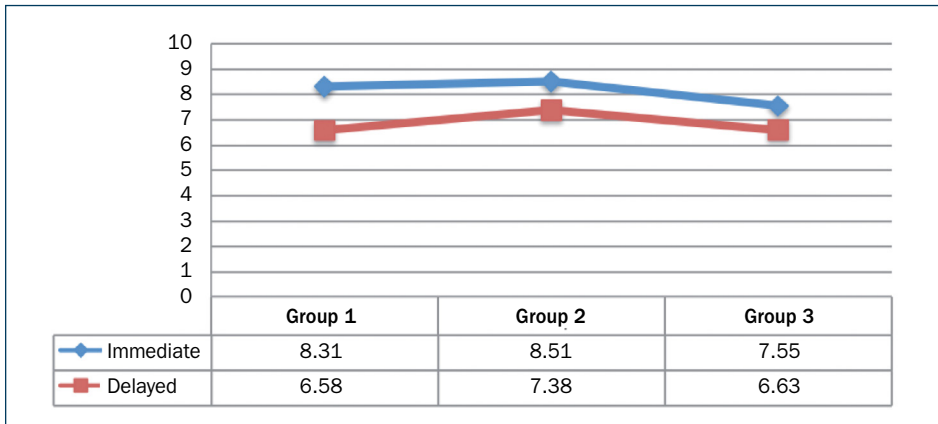


Graph 1. Results of glossed L1 translation methodology.

Regarding the difference from the immediate to the delayed post-test, it can be observed (see Graph 1) that Groups 1 and 2 underwent a drop of 1.39 (from 6.23 to 4.84) and 0.88 (from 7.42 to 6.54) respectively. Surprisingly, the results of Group 3 were better in the delayed post-test than in the immediate post-test, so the students in this group had a gain of 0.35 points, from 6.38 to 6.73.

b) *Results of the image-based methodology*

Focusing on the image-based methodology, Graph 2 shows that the results were quite similar in the three groups. The best results in the immediate post-test were obtained by Group 2 with 8.51 points, followed by Group 1 who scored 8.31 points, and Group 3 with 7.55 points. The difference between the highest and the lowest result is just 0.96 points. In the delayed post-test, Group 2 also obtained the highest score, 7.38, followed by Group 3, 6.63 points, and Group 1, which scored 6.58 points.

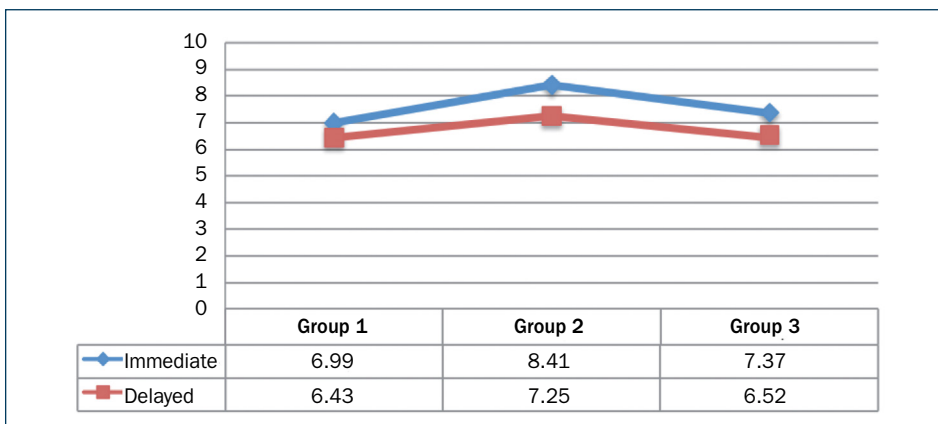


Graph 2. Results of the image-based methodology.

Considering delayed recall, the results of the delayed post-test show that every group had a lower mark than in the immediate post-test as could be expected. If we compare Groups 1 and 3, we can notice that Group 1 had the best result in the immediate post-test and Group 3 did better in the delayed post-test, which means that Group 3 had the best recall because the drop of results after a week was smaller in this group.

c) Results of the video-based methodology

Regarding the video-based methodology (see Graph 3), the best result in the immediate post-test was obtained by Group 2 with 8.41 points, followed by Group



Graph 3. Video-based.

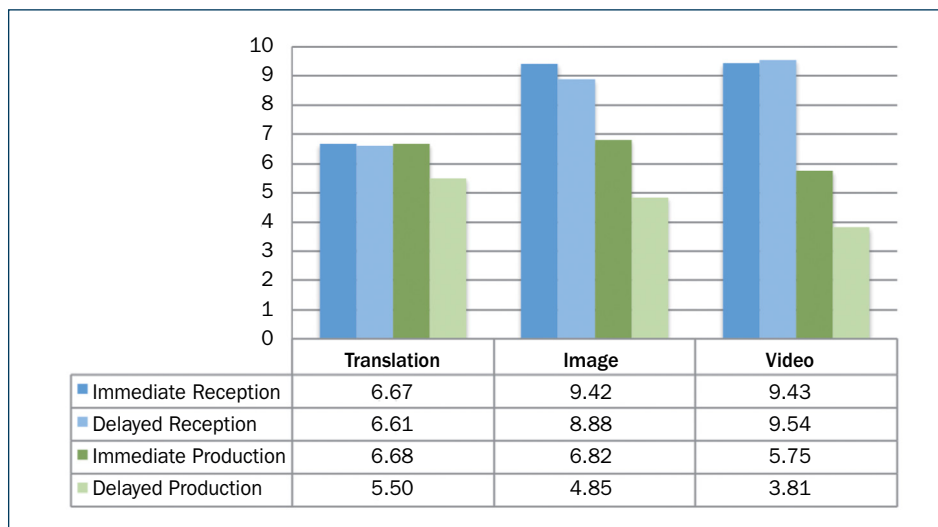
3 with 7.37 points, and finally by Group 1 with 6.99 points. There is not a big difference between the best and the worst groups, only 1.42 points. The same order from the group who scored the highest (Group 2 obtained 7.25 points) to the lowest (Group 1 obtained 6.43 points) was also seen in the delayed post-test.

If we consider delayed recall, the biggest drop could be observed in Group 2 (1.16 points drop) so this group had a worse recall. Recall in Group 3 experienced a 0.85 points drop, from 7.37 to 6.52, and in Group 1 a 0.56 drop, from 6.99 to 6.43.

2. General results focused on types of vocabulary knowledge

Taking into consideration the two types of vocabulary knowledge, receptive or passive and productive or active, the best results for receptive vocabulary were obtained in the image-based and video-based methodologies (see Table 2). The immediate reception results were 9.42 points for the image-based methodology, and 9.43 for the video-based so there was no remarkable difference between these two methodologies in receptive knowledge. In the glossed L1 translation methodology, results for immediate reception were quite worse (6.67). Considering delayed receptive knowledge, we can see similar results in both the image-based methodology (8.88) and the video-based methodology (9.54) in contrast with a lower score in glossed L1 translation (6.61).

Table 2. Results based on reception and production

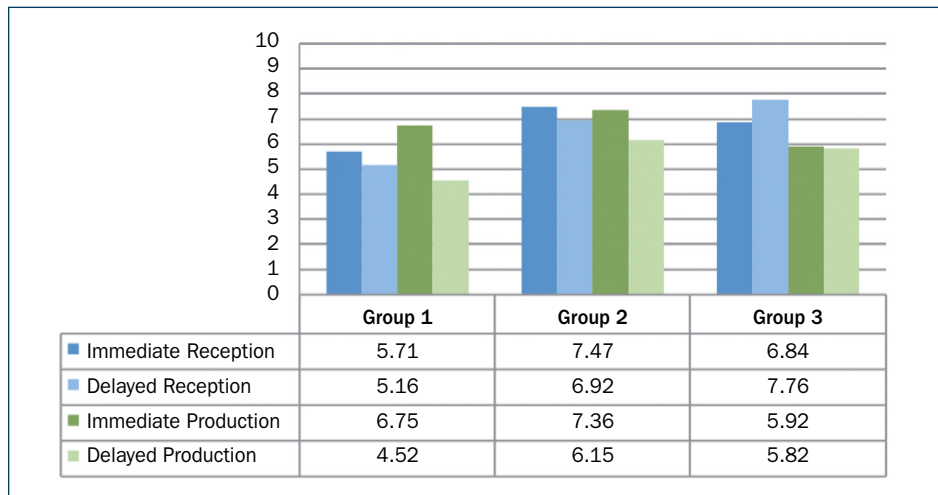


In terms of productive knowledge, there were no significant variations between methodologies. Students scored 6.68 points with the glossed L1 translation methodology, 6.82 points with the image-based methodology, and 5.75 points with the video-based methodology. These results mean that the difference between the best result in productive knowledge and the worst was just 1.07 points. In terms of delayed productive knowledge, the best result was for the glossed L1 translation methodology (5.50), followed by the image-based (4.85) and the video-based (3.81), which was the methodology which showed the worst results in delayed production.

a) *Receptive and productive results with the glossed L1 translation methodology*

As can be seen in Table 3, the results for immediate receptive knowledge or recognition using the glossed L1 translation methodology were 5.71 points in Group 1, 7.47 in Group 2 and 6.84 in Group 3. The results for delayed receptive knowledge were 5.16 points in Group 1, 6.92 in Group 2 and 7.76 in Group 3.

Table 3. Receptive and productive results for the glossed L1 translation methodology



Considering the production of vocabulary, the results for the immediate production tests were 6.75 points in Group 1, 7.36 in Group 2 and 5.92 in Group 3. In terms of delayed production, the results were 4.52 points for Group 1, 6.15 for Group 2 and 5.82 for Group 3

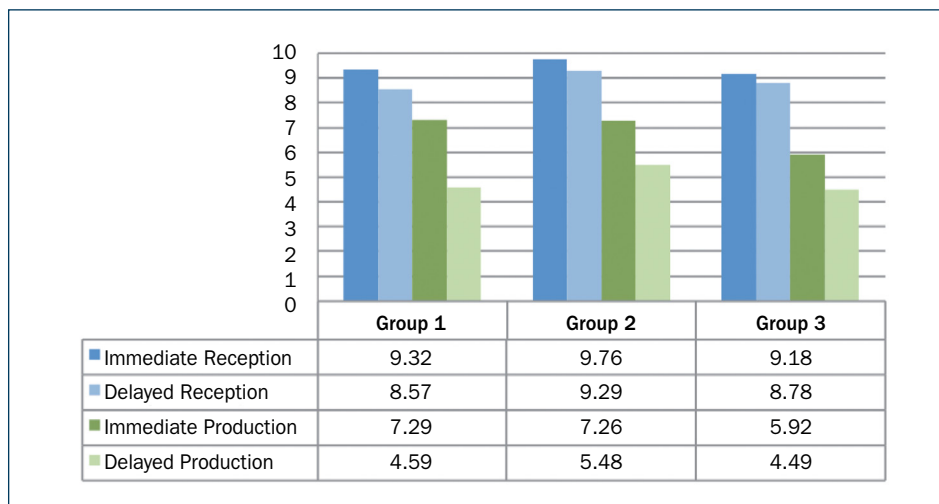
Comparing both kinds of knowledge, the results in Group 1 for immediate reception (5.71) were worse than for immediate production (6.75), while in the rest of the groups immediate reception was better than production. Regarding the evolution from immediate to delayed knowledge, all groups experienced a drop from immediate to delayed post-test except for Group 3, which experienced an increase in receptive knowledge from the immediate to the delayed post-test.

Group 1 underwent a drop from the immediate to the delayed post-test of 0.55 points in receptive knowledge, from 5.71 to 5.13, and 2.23 points in productive knowledge, from 7.75 to 4.52. Group 2 also experienced a drop of 0.55 points in receptive knowledge, from 7.47 to 6.92, and 1.21 in productive knowledge, from 7.36 to 6.15. Finally, Group 3 surprisingly underwent a gain of 0.92 in receptive knowledge, from 6.84 to 7.76, and a drop of 0.10 in productive knowledge, from 8.92 to 5.82.

b) *Receptive and productive results for the image-based methodology*

As shown in Table 4, in terms of immediate reception, Group 1 obtained 9.32 points, Group 2 obtained 9.76 and Group 3 obtained 9.18. However, all the groups experienced a drop from the immediate post-test to the delayed post-test, Group 1 obtained 8.57, Group 2 obtained 9.29 and Group 3 obtained 8.78 respectively.

Table 4. Reception and production results for the image-based methodology



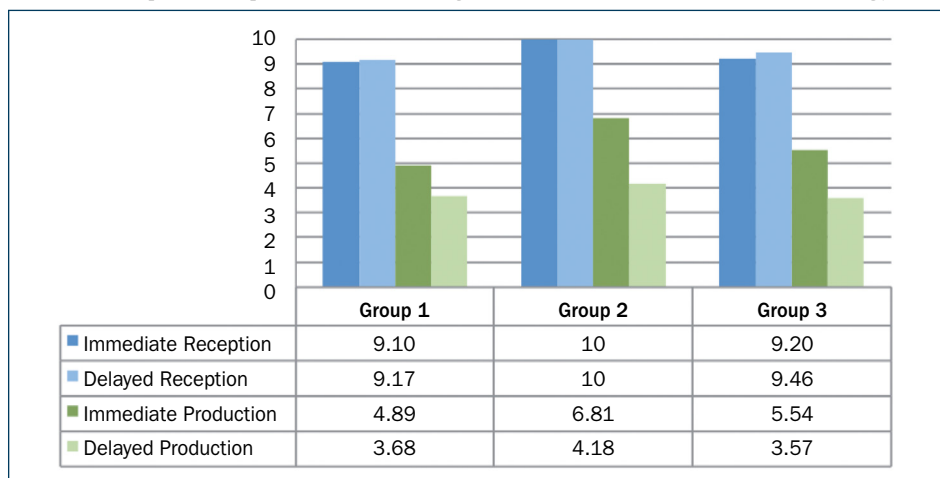
If we consider immediate production, Group 1 had a result of 7.29 points, Group 2 of 7.26 and Group 3 scored 5.92. As expected, the results for production were lower than for reception. In terms of delayed productive knowledge, the results were 4.59 points for Group 1, 5.48 points for Group 2, and 4.49 for Group 3. So the results for productive vocabulary knowledge are smaller than the results for receptive vocabulary knowledge.

Focusing on the drop from the immediate to the delayed post-tests, we can observe a drop in all the groups so the results were better right after the treatment than one week later. In terms of receptive vocabulary, the results of Group 1 underwent a drop of 0.75, from 9.32 to 8.57. Group 2 experienced a drop of 0.47 points, from 9.76 to 9.29. Finally, Group 3 had a drop of 0.40 points, from 9.18 to 8.78. In terms of productive vocabulary, Group 1 results had a drop of 2.70 points, from 7.29 to 4.59, while Group 2 had a drop of 1.78 points, from 7.26 to 5.48, and Group 3 results suffered a drop of 1.43 points, from 5.92 to 4.49. The analysis of these results shows that productive language underwent a higher drop than receptive language.

c) *Receptive and productive results for the video-based methodology*

As can be seen in Table 5, for immediate recognition the result obtained was 9.1 points by Group 1, 10 points by Group 2, and 9.2 points for Group 3. Regarding delayed receptive knowledge, the results were 9.17 points for Group 1, 10 points for Group 2 and 9.46 points for Group 3.

Table 5. Receptive and productive knowledge results for the video-based methodology

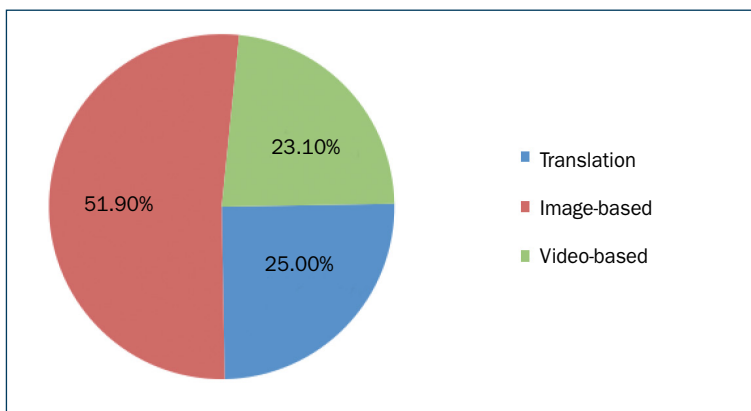


Regarding the immediate production, the results were 4.89 for Group 1, 6.81 for Group 2, and 5.54 for Group 3. All groups dropped their results in the delayed productive knowledge part of the test. Group 1 obtained 3.68 points, Group 2 4.18 points and Group 3 scored 3.57. The results for the immediate reception were better than for production.

Considering the differences between the immediate and the delayed post-tests, we can see that the results of the receptive vocabulary in Group 1 underwent a gain of 0.07, from 9.1 to 9.17, Group 2 obtained the same punctuation (10) and Group 3 suffered a gain of 0.26, from 9.2 to 9.46. The results of productive vocabulary had a drop of 1.21 points in Group 1, from 4.89 to 3.68, a drop of 2.63 points in Group 2, from 6.81 to 4.18, and 1.98 points in Group 3, from 5.54 to 3.57.

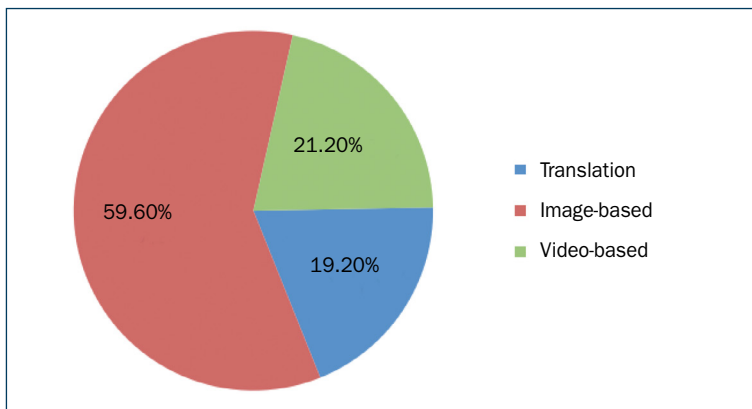
3. *Qualitative results*

Taking into consideration the answers in the final questionnaire (see Graph 4), the methodology that students liked the most was the image-based methodology with 51.9% of the students choosing that option. 25% of the students chose glossed L1 translation methodology, and 23.1% video-based methodology.



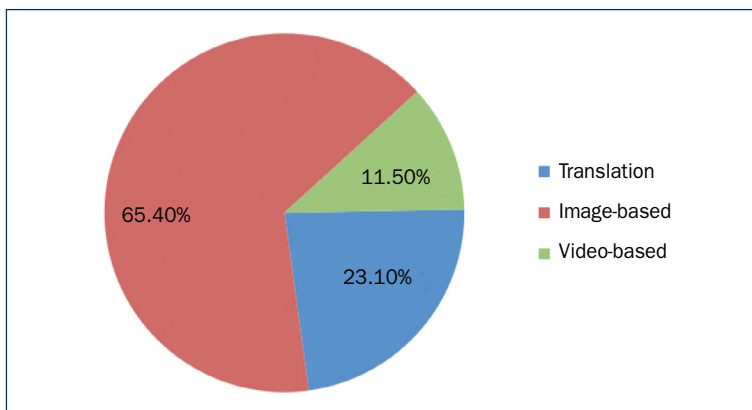
Graph 4. Favourite methodology.

As shown in Graph 5, the methodology that students perceived as the most effective to acquire vocabulary was the image-based methodology with 59.6% of the students mentioning it followed by the video-based with 21.2%, and by the glossed L1 translation chosen by 19.2%.



Graph 5. Most effective methodology for vocabulary acquisition.

As can be seen in Graph 6, the methodology that students perceived was the most effective to recall vocabulary one week after treatment was image-based with 65.4% selecting it, followed by glossed L1 translation chosen by 23.1% and video-based elected by 11.5%.



Graph 6. Most effective methodology for vocabulary recalling.

When considering the difficulty they had had to understand the vocabulary taught using the three methodologies, 25% of the students considered the glossed L1 translation methodology as easy, 76.9% as normal and 11.5% as hard. Nobody considered understanding using this methodology as very hard. 51.9%

of the students rated the perceived difficulty to understand vocabulary using the image-based methodology as easy, 46.2 % as normal, 5.8 % as hard and 3.8 % as very-hard. Regarding the video-based methodology, 32.7 % of the students considered it easy to understand vocabulary using that methodology, 53.8 % as normal, 15.4 % as hard and 3.8 % as very hard.

The results regarding students' opinions about the process and the methodologies included the following recurrent themes: first, many students considered the glossed L1 translation methodology as boring. Some students also stated that it had been hard for them to infer vocabulary from the clips of video despite the researcher's indications. Some students expressed that at some point the explanations were too fast and difficult to follow. And finally, many students felt that they had done too many tests.

V. Discussion

The discussion will try to provide an answer to the three research questions which guided this research.

RQ1: Is video assisted vocabulary learning more effective than image assisted or glossed L1 translations? Do any of these techniques imply a better recall?

From the data obtained during the collection process, it can be noticed that students obtained the best results in the immediate post-test using the image-video methodology (8.12) while the results for video-based were 7.59 and for glossed L1 translation 6.68. This supports previous research in the field (Hu & Deng, 2007), which has stated that the use of multi-media input can improve students' vocabulary acquisition. This result is also in line with the research conducted by Mashhadi and Jamalifar (2015), which found that students that have visual support when learning outperform those students who do not. In the same line, it also supports Paivio's (1971) and Mayer's (2001) theories because when students have a non-verbal and a verbal representation, the acquisition process is more efficient.

On the contrary, some researchers like Al-Seghayer (2001) obtained as a result of research that a video clip combined with a text definition outperformed an image with a text definition. So these results do not agree with the results shown in this research. This can be due to a possible cognitive overload (Baggett, 1989) because sometimes when using multimedia materials students re-

ceive too much information, which might overload their brain because it has to make too great an effort and so the information is not acquired properly. In this sense, some students expressed in the final questionnaire that when they were watching the video they had difficulties to understand the word despite the researcher's indications because they got distracted.

If we focus on delayed recall, the highest drop registered from the immediate to the delayed post-test occurred when using the image-based methodology (1.26), in contrast to the glossed L1 translation methodology (0.64) or the video-based (0.86). Nevertheless, the results of the image-based methodology were still the best in receptive knowledge one week after the treatment. This reinforces the results reported by Hashemi and Pourgharib (2013) because the students who learnt vocabulary using visual materials also had a better learning and retention.

Regarding the fact that Group 3 obtained better results in the delayed post-test than in the immediate post-test for the glossed L1 translation methodology, two factors might explain those results. The first factor is that some students might have cheated on the test because some students that were sitting together showed the same spelling errors and, surprisingly, outperformed the results they had got in the immediate post-test. The second factor were two tricky definitions appearing on the matching exercise where the definitions of two items (*selfish* and *vain*) were easily misunderstood. Some students failed to identify those terms in the immediate post-test maybe because they were tired, and they did not read the definitions in Spanish carefully enough.

RQ2: Are there any differences considering receptive and productive stages?

From the results in the results section, it can be inferred that there were important differences between receptive and productive vocabulary knowledge as expected. Except for the glossed L1 translation method, the results of receptive vocabulary knowledge were better than productive knowledge. The results of both the image-based and the video-based methodology support previous research results (Griffin & Harley, 1996; Schneider, Healy & Bourne, 2002; Stoddard, 1929; Waring, 1997) stating better results in receptive than in productive knowledge. For example, the image-based methodology obtained 9.42 points in the immediate reception and 6.82 in the immediate production, and the video-based methodology got 9.43 points in the immediate reception and 5.75 in the immediate production. Nevertheless, the results obtained using the glossed L1 translation methodology showed that there were no differences between reception and production in the immediate post-test. This contradicts the results

previously reported by Griffin & Harley (1996), Schneider, Healy and Bourne (2002), Stoddard (1929), and Waring (1997). As it was mentioned before, this may be due to the easily confusing definitions of two items in the receptive part (*vain* and *stubborn*) that many students failed to identify correctly in the immediate post-test when they might have been tired and did not read carefully, but identified correctly in the delayed post-test that was administered to them at the beginning of the class when they were not as tired.

Focusing on the drop between the immediate and the delayed post-test regarding productive and receptive vocabulary, receptive vocabulary barely changes. For example, when using the glossed L1 translation methodology a drop of 0.06 points from 6.67 to 6.61 was observed, a drop of 0.56 points from 9.42 to 8.88 with the image-based methodology, but a gain of 0.13 points from 9.43 to 9.54 with the video-based methodology. So the three methodologies are beneficial for receptive vocabulary acquisition and help students maintain their receptive vocabulary effectively. Considering productive vocabulary, we can observe a drop with all the methodologies. For example, the results for the glossed L1 translation methodology showed a drop of 1.18 in the production of vocabulary from 6.68 to 5.50, a drop of 1.97 points for the image-based methodology, from 6.82 to 4.85, and a drop of 1.94 points, from 5.75 to 3.81, for the video-based methodology. In summary, it seems that receptive vocabulary knowledge is maintained, while there is an important loss in productive vocabulary knowledge with the three methodologies. Apparently, the three methodologies are equally beneficial for receptive and productive vocabulary learning.

RQ3: Do EFL learners receive these methods as positive? What type of vocabulary learning do they prefer?

In the comments that students included in the last open question of the final questionnaire, many students expressed positive comments about the methods. Most of the students expressed their satisfaction about all the vocabulary that they had learnt, and they considered that vocabulary as very useful. Some students considered the glossed L1 translation methodology as boring. As much as 51.9% of the students chose the image-based as their favourite, 25% the glossed L1 translation methodology, and 23.1% the video-based methodology. The low results obtained by the video-based methodology can seem surprising but they might be due to the cognitive overload that video input can provoke (Baggett, 1989) because sometimes when using multimedia materials students receive too much information.

VI. Conclusions and Pedagogical Recommendations

The results of this research showed that in terms of immediate acquisition, the image-based methodology seems to be the best for immediate acquisition and delayed recall. The results were slightly better than for both video-based and glossed L1 translation methodologies respectively.

Focusing on receptive and productive vocabulary, the results showed that the results of the image-based and the video-based methodologies were quite better than the results of the glossed L1 translation methodology for receptive vocabulary. But we need to be cautious and it is necessary to remember the confusion generated in the immediate post-test with the vocabulary items *vain* and *stubborn*. For productive vocabulary, the results of the immediate post-test were similar for the translation methodology and the image-based methodology, while the results for the video-based were slightly worse. The results for the delayed recall experienced a very slight drop from the immediate to the delayed post-test in receptive vocabulary, while productive vocabulary results suffered a similar drop in all the methodologies.

Considering students' preferences, most of the students preferred the image-based methodology and they perceived the glossed L1 translation methodology as boring and old-fashioned. Surprisingly, some students did not like the video-based methodology because some of them expressed that the amount of information was difficult to process, so this methodology might produce a cognitive overload. Because of that, teachers should be cautious when using this methodology.

It is necessary to consider the possible limitations of this research. Due to the type of vocabulary employed in each methodology, one set of vocabulary might be easier than other so this could have affected the final results. Also the quantity of tests done by students in a short period of time, even shorter because students had some activities that made the data collection process shorter and more complicated has to be considered. As a result of this, the process of data collection was shorter than expected with a consequent decrease in students' interest.

Based on the results of this research and the experience with students during the period of data collection, some pedagogical recommendations can be given. It is clear that students' attitude is a core element in teaching and learning, so the fact that students prefer visual and audio visual input should be taken into consideration. Students perceive the glossed L1 translation methodology as boring and traditional. The quantitative results have also shown that visual and audio-visual input obtain better results on immediate and delayed recall, so the glossed L1 translation methodology should not be used very often.

The video-based methodology obtained better quantitative results than the glossed L1 translation methodology in this research. On the contrary, students expressed that it was difficult to focus their attention when watching a video. This difficulty might be due to the cognitive overload too much information might provoke and it might make students' comprehension and learning more difficult, so this should be taken into consideration. This methodology can be used because good quantitative results have been obtained, but it should be used carefully due to the aforementioned cognitive overload limitations.

The image-based methodology appears to be the best methodology for vocabulary acquisition. This methodology obtained the best quantitative results in this research and, on the other hand, students expressed that this methodology is the one they liked the most. Considering these results, the image-based methodology can be highly recommendable.

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