# Using quizzes to assess and enhance learning of English as a foreign language

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This article addresses the testing effect, which refers to the increase in learning that results from taking tests (Halamish & Bjork, 2011; Karpicke & Roediger, 2008; Roediger, Agarwal, McDaniel, & McDermott, 2011). The aim was to find out, with a Pretest/Posttest design, whether quizzes can be an effective tool for learning in an EFL environment due to the repeated testing. There are numerous publications dealing with the use of quizzes with concepts from different disciplines (Bälter, Enström, & Klingenberg, 2013; McDaniel, Wildman, & Anderson, 2012); however, this research takes it a step further because it is the first time that the effect of quizzes has been experimentally verified with English modal expressions and verbs. The outcome of this research benefits foreign language teachers and supports the long-term learning with quizzes in a foreign language.

Keywords: quizzes, testing effect, teaching English, learning English, EFL

#### 1. Introduction

The purpose of this study is to test the benefit gained from having students take quizzes while learning English modal expressions and verbs. The two main differences between quizzes and exams are that the former are short and periodic tests used either for formative or summative evaluation "in education and similar fields to measure growth in knowledge" (*Wikipedia*, http://en.wikipedia.org/wiki/Quiz).

As the literature related to the topic under investigation points out, repeated retrieval ("the testing effect"), which is what occurs with quizzes, produces better retention than re-studying the material (Karpicke & Roediger, 2008; Kornell, Bjork, & Garcia, 2011; Roediger & Karpicke, 2006a; Roediger, McDermott, & McDaniel, 2011). This happens mainly when immediate feedback is provided, which avoids superficial or rote learning (Roediger, Putnam, & Smith, 2011),

and when quizzes are repeated with a view to an exam (Roediger & Marsh, 2005; Szupnar, McDermott, & Roediger, 2007).

Conducting quizzes empowers learning and provides direct and indirect benefits, which in all likelihood improve student perfomance. One direct advantage is that students have to keep up to date with the material, which encourages good study habits (Bälter et al., 2013; Roediger, Putnam, & Smith, 2011). In this approach, intensive study concentrated into a few days has no place, since learning is not limited to the moments immediately before a final examination.

As indirect benefits, the results of the quizzes can guide and regulate students' own learning when they relate their prior knowledge to the correct explanation (Karpicke & Roediger, 2007; McDaniel, Agarwal, Huelser, McDermott, & Roediger, 2011; Roediger, McDermott, & McDaniel, 2011). In this way they can develop self-correction strategies (Ainsworth & Loizou, 2003; McNamara, 2004), which promotes long-term learning due to the cognitive processing carried out (Craig, Sullins, Witherspoon, & Gholson, 2006; Roediger, Putnam, & Smith, 2011) and eliminates the "illusion of knowing" that students sometimes have (Cepeda, Pashler, Vul, Wixted, & Rohrer, 2006). The immediate feedback that students receive on their own performance helps to achieve this goal (Pashler, Cepeda, Wixted, & Rohrer, 2005; Roediger & Marsh, 2005; Szupnar et al., 2007). All together leads to an increase in learner engagement and an improvement of grades in the final exam (Bälter et al., 2013), thus promoting the autonomy sought in the learning process.

Having students take quizzes can help eliminate the anxiety that may occur when they face a test (McDaniel et al., 2011) and also helps them to organize, integrate and synthesize the contents as they search for information when trying to answer the questions; they also foster the distributed practice involved in writing the answers (Cepeda et al., 2009; Roediger, 2013; Sánchez, 2006; Zarom & Roediger, 2010). Furthermore, the cognitive activity that takes place helps students to generate information, resulting in long-term learning (Butler & Roediger, 2007; McDaniel, Anderson, Derbish, & Morrisette, 2007; Roediger, McDermott, & McDaniel, 2011). Students can also become aware of the beneficial effect of retrieval practice in learning and memorization (Halamish & Bjork, 2011; Kornell et al., 2011; Wheeler & Roediger, 1992) and learn more because of it since, as mentioned, it is more useful to reconsider or review the information than to restudy (Bjork, 1994; Bransford, Brown, & Cocking, 2000; Roediger, McDermott, & McDaniel, 2011). Likewise, although it does not fall within the aim of this study, it is thought that participants who perform quizzes can obtain higher grades, because by following this system they know how the teacher evaluates and the type of final exam they can expect.

Several studies similar to the one we report on here have been performed in other fields. They were carried out in actual classroom settings with online quizzes using concepts from different disciplines such as brain and behavior (McDaniel, Wildman, & Anderson, 2012), computer sciences and applied statistics (Bälter et al., 2013; Lyle & Crawford, 2011), mathematics (Angus & Watson, 2009), physiology (Kibble, 2007), etc., or as part of a class of social studies (Roediger, McDermott, & McDaniel, 2011) or psychology learning (Saville, Pope, Lovaas, & Williams, 2012). However, to our knowledge, no study has dealt with the use of grammatical aspects of EFL, specifically modal expressions and verbs. The purpose of this study is precisely to verify whether the use of quizzes in an EFL environment can be a quick and effective tool for learning due to the repeated testing. We intend to restructure the current teaching method using quizzes in our classes because they can be a useful tool, and unfortunately they do not usually form part of the arsenal of educational techniques (McDaniel et al., 2011; Roediger, McDermott, & McDaniel, 2011). This approach is novel for two reasons: (a) It is the first time that the testing effect of quizzes has been studied in foreign language learning and (b) because it addresses grammatical aspects, a different material from vocabulary.

Considering the literature and ideas mentioned above, the following working hypothesis is posited:

Students who are regularly given quizzes with English modal expressions and verbs and immediate feedback in an EFL classroom will learn more than the students not used to taking quizzes.

If this research hypothesis is confirmed we can conclude the effectiveness of repeated testing with quizzes which include grammatical aspects.

# The study

In this section we explain how the research was conducted. To this end, several subsections are included: Method, Design, Participants, Materials and Data collection procedure.

#### 2.1 Method

The study was carried out in the fall semester with an experimental methodology. Two groups of participants enrolled in the subject "English Language I" in the first year of the "English Studies" degree program at a Spanish University were used to gather the data.

#### 2.2 Design

To check the initial equivalence in language level, the two groups of "English Language I" were given a Level Test at the beginning of the semester.

We also administered a test before (Pretest) and after the treatment (Posttest), in both the experimental and control group. It was a quasi-experimental design since one entire group was randomly assigned to the group who took quizzes (experimental group), and the other to the group who did not take them (control group).

The treatment with quizzes was conducted over approximately 2 weeks. We allowed one week between quizzes because according to the ideas implied in distributed practice this can help to consolidate the material (Cepeda et al., 2009; Cepeda et al., 2006; Cull, 2000; Sánchez, 2006). The administration of quizzes in regard to the contents of one of the units of the textbook we were working with (unit 3) took place in the classroom. Participants filled in two different quizzes, and though this may not seem to be a particularly robust treatment (2 quizzes) it was enough to test the activities done in the classroom with the contents of that specific unit. They all took place at the beginning of the class in the first 20 minutes and immediate feedback was given. Since the participants had an intermediate level in English no previous instruction on modal verbs was provided; the feedback given after the quiz served to meet the learning goal. Depending on the questions, corrections were carried out either in pairs or in small groups (4 students maximum). The teacher scored them in order to encourage participants to have an interest in the tasks assigned.

The same teacher administered the Level Test, the Pretest and Posttest, and the quizzes in order to maintain consistency in the procedure followed. To ensure reliability in grading an instructor who had nothing to do with this research graded the Pretest and the Posttest.

The Pretest and Posttest were performed as classroom exercises and students participated without being informed that the results would be used for research until they took the Posttest and completed the informed consent document. Nothing was said about this before because we did not want students to think these tasks were unrelated to the class. Neither did we want to alert them of the existence of a second test (Posttest), so that they would not study for it.

# 2.3 Participants

Two groups of Spanish students in "English Language I" with an intermediate level in English language equivalent to B1 according to the Common European frame-

work of reference for languages: Learning, teaching, assessment (Council of Europe, 2011) participated in this research.

In the first week of classes, participants (N = 70) were given a Level Test: 35 students participated in the experimental group (females: 91.42%, males: 8.57%; mean age 18.6) and 35 (females 88.57%, males: 11.42%; mean age 18.5) in the control group.

Thirty-nine students participated in the Pretest and Posttest in the experimental group, but as we had repeated measures we only used the data of the subjects who had participated in the two phases. Therefore, the final number was N = 33(females: 96.96%, males: 3.03%; mean age 18.6). In the control group we also had repeated measures. Thus, although 40 students participated in the Pretest and 45 in the Posttest we considered the data of 32 participants (females: 93.75%, males: 6.25%; mean age 18.7).

Table 1. Information or	n participants
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	Experimental group	Control group
LEVEL TEST	N = 35	N = 35
	Females 91.42%	Females 88.57%
	Males 8.57%	Males 11.42%
	Mean age 18.6	Mean age 18.5
PRETEST AND POSTTEST	N = 33	<i>N</i> = 32
	Females 96.96%	Females 93.75%
	Males 3.03%	Males 6.25%
	Mean age 18.6	Mean age 18.7

There is a small difference in the number of subjects (33/32), but not enough to endanger the study because the statistical test to be used is flexible when the two samples are different in size (Brown, 1988).

#### 2.4 Materials

#### Level Test

A multiple-choice exercise with 25 sentences and 4 items per sentence was used. The exercise dealt with prepositions, specific vocabulary, phrasal verbs, different tenses and idiomatic expresions. The sentences were very similar to the ones in the students' textbook (First Certificate: Masterclass, Haines & Stewart, 2008). Students were supposed to choose the best option to complete the sentence with a word, expression and occasionally with a complete sentence.

#### 2.4.2 Treatment

The contents evaluated in two different quizzes belong to the textbook *First Certificate: Masterclass* (Haines & Stewart, 2008), and were designed using short-answer questions (e. g., see Quiz 1 in Appendix 1) whose effects have been proved to be more robust than multiple-choice quizzing effects (McDaniel, Thomas, Agarwal, McDermott, & Roediger, 2013; McDaniel et al., 2007; McDaniel et al., 2012; Roediger, McDermott, & McDaniel, 2011). According to the student text-book, the quizzes focused on lexical and grammatical aspects dealing with the appropriate use of *can, be able to, manage (to)* and *succeed (in)*.

Students retrieved aspects of the English language studied in previous units though sometimes they were not the target of the research (Cepeda et al., 2006; Cepeda et al., 2009). The fact that students obtained immediate feedback solved their doubts, allowing them even to attain self-correction in some cases (Pashler et al., 2005; Roediger & Marsh, 2005; Szupnar et al., 2007)

As already mentioned, the treatment lasted two weeks. The main themes and the source of the quizzes that were taken from several webpages and adapted to students' level appear below:

• Could / Was able to / Were able to

http://www.ejerciciodeingles.com/ejercicios-distinguir-entre-could-was-were-able-to/

· Be able to

http://www.ejerciciodeingles.com/ejercicios-formas-be-able-to-contexto/

• Can / Manage / Succeed. Prepositions

http://www.better-english.com/grammar/managedto.htm

http://www.linguee.es/ingles-espanol/traduccion/succeeded+in.html

#### SECOND QUIZ

• Phrasal Verbs (Turn)

http://www.shertonenglish.com/resources/es/phrasal-verbs/phrasals-turn.php

• Can / Could / Be able to / Manage / Succeed. Prepositions

http://www.englishclub.com/grammar/verbs-modals\_can\_quiz.htm

https://sites.google.com/site/aprenderinglespage/unidad51-52

Figure 1. Type of exercises and source

#### 2.4.3 Pretest and Posttest

The Pretest and the Posttest did not include questions given on the quizzes, but rather questions targeting the same content because they enable close transfer to new questions (McDaniel et al., 2013; Roediger, Putnam, & Smith, 2011). They contained short-answer questions related to the content tested in the quizzes and also some questions related to the content studied in previous units with the purpose of reviewing this material since these tests (Pretest and Posttest) were also done as class exercises (e. g., see the Pretest in Appendix 2). Nonetheless, for the purposes of this study the content that was not related to the one in the quizzes was not scored. They contained the relevant aspects of unit number 3 in the text-book. In accordance with the literature they:

- had an appropriate level of difficulty to trigger encoding and retrieval processes (Bjork, 1988, 1999, 2013),
- were neither too easy nor too difficult so that students would not be discouraged or minimize their cognitive effort to perform them (Bjork, 2013; Metcalfe & Kornell, 2005; VanLehn et al., 2007). The degree of difficulty, decided by two teachers who had nothing to do with the research, were quite similar in the Pre and Posttest (99% agreement).

#### 2.5 Data collection procedure

Students completed a Level Test at the beginning of the academic year. This test was done to verify whether our two groups had the same language level. We also gave a test (Pretest) on the use of English containing the modal expressions and verbs to both the experimental and control groups. Then, we conducted the treatment with quizzes over approximately 2 weeks. Finally, the two groups of students took a final test (Posttest). The comparison between the results obtained in the Pretest and Posttest allowed us to check the effect of the repeated testing with quizzes.

#### 3. Results

The Level Test confirmed the initial equivalent level of the two groups of students of "English Language I": t(68) = 0.097, p = 0.9229, a necessary condition to go ahead with our study.

The between-subjects analysis to compare the two groups of students (experimental/control) before administering the treatment (quizzes) indicated that both groups possessed a similar level: t(63) = 0.250, p = 0.8036. The initial equal performance between these two groups corresponded with the Level Test given to both groups in the first week of class. Neither of the two tests (Pretest or Level Test) showed a statistically significant difference between the groups participating in

the study. These results verify and help demonstrate equal initial knowledge of the two groups in this study.

The results of a repeated measure ANOVA indicated a significant main effect for group. That is, the students who took quizzes generally had a higher average result than the ones in the control group (see Appendix 2 for statistical analysis). There is also a significant main effect for treatment (p < .0001) and a significant interaction F(1, 63) = 43,511, p < .0001 indicating the change that took place in the group due to quizzes.

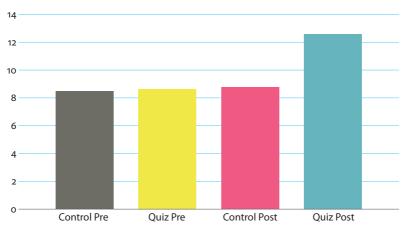


Figure 2. Mean in the Pretests and Posttests

The t-test performed between groups in the Posttest phase provided a significant difference between the two research groups due to the treatment of the independent variable: Application of quizzes: t(63) = 5.327, p < .0001, which confirms our hypothesis and therefore the effectiveness of repeated testing.

#### 4. Conclusions

A foreign language teaching methodology with quizzes, in this case EFL, enhances learning of expressions and verbal structures. Following this approach, useful for the development of lexical and syntactic skills, long examinations would no longer be necessary. This entails a considerable saving of class time and a smaller number of hours devoted by teachers to correction of long exams. Applying quizzes in the classroom setting proved to be not only effective but also very easy to use. Therefore, quizzes, a technique infrequently used in levels higher than elementary school (McDaniel et al., 2011; Roediger, McDermott, & McDaniel, 2011; Roediger,

Putnam, & Smith, 2011), should be encouraged in a foreign language class because they are a quick and an effective tool for long-term learning.

Moreover, as has been pointed out, quizzes may be used by the students as a guide to review or focus their attention on different aspects, thus regulating their own learning, ultimately improving their performance (Karpicke & Roediger, 2007; McDaniel et al., 2011; Roediger & Karpicke, 2006b; Roediger, McDermott, & McDaniel, 2011; Roediger, Putnam, & Smith, 2011).

Previous successful applications of quizzes in other subjects (e. g. computer sciences, statistics, mathematics, psychology, social studies, etc.), together with the findings of this study, show some generalizability across learning conditions, students and types of materials. Therefore, quizzes could also be useful to improve performance in different skills, such as comprehension. Teachers can easily develop quick oral quizzes (podcasts) in which the students listen and respond to questions in class (Sánchez, Diego, & Alonso, 2010). The same can be done with written texts. In line with the ideas on the "testing effect" (Dempster, 1997; Halamish & Bjork, 2011; Kornell et al., 2011; Roediger, Agarwal, McDaniel, & McDermott, 2011), it is likely that conducting periodic quizzes with written or oral comprehension questions (e.g., short answer, multiple choice, etc.) can help students improve in this skill due to the different cognitive mechanisms related to recognition and retrieval of material. Nonetheless, further research should be done with a larger sample size and other types of exercises in order to accumulate knowledge for an accurate diagnosis of the type of quiz to be used when we want to generate a particular type of response.

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#### Appendix 1

#### Quiz number 1

I.	Co	implete the sentences with $\epsilon a$	ould/was/were able to and the verbs in brackets.
	1.	The police	(catch) the thief shortly after the rob-
		bery.	
	2.	Не	(cycle) for hours when he was a kid and he
		wouldn't feel tired.	
	3.	She	(not/ write) until she was 10.
	4.	We	(not/ fix) the central heating, so we had to call the
		technician.	
	5.	The house was on fire, but	he(escape) through the
		chimney.	
	6.	People	(not/travel) abroad under the communist re-
		gime.	
	7.	I	(study) all day and all night when I was a stu-
		dent.	
	8.	She	(answer) all the questions, so she did not fail
		her exam.	
ΙΙ	Co	mplete with the correct form	n of be able to and the verb in brackets.
11.		•	
	1.	where.	(drive) my own car every-
	2		(van danstan d) h avy th av
	۷.		ever (understand) how they
	2	can get along so well.	(amouses) the question
	э.	II I Had read the book, I	(answer) the question.

	4.	When I read the letter, I realised what he	2	(achieve).
	5.	I would love		
	6.	She dreams of	(get) a position at univ	ersity.
	7.	Yesterday I	(fix) the oven and bake a birth	nday cake for
		my son.	(,	,
	8.	With this information, you should	(fi	nd) the thief
	9.	(do		
	Co	omplete the following sentences using the brackets. Add words if necessary (e. g. p	e correct form of can, manage, suc	•
	1.	It was quite difficult but he		et) it all done.
		I		
		I would have liked to have gone but I		
	٥.	ticket.		(gct) a
	4		(	T4
	4.	For once, I	(get up) early tod	ay. It was an
	_	effort.	( 11) 1 1	1 0 4
	5.	He	(walk) when he was on	lly 8 months
		old.		
	6.	She missed the last train but she		(get) a
		taxi.		
	7.	He has	(create) a solid market po	sition in this
	etes			
A.	Co	omplete these sentences with the correct		
	1.	At this time tomorrow, you	(work) in this	office for ten
		years.		
		Next year I		
	3.	I won't be at work tomorrow. I	(go) for an in	nterview for a
		new job.		
	4.	Hurry up! Your favourite program	(start)	in five min-
		utes.		
	5.	On Monday we	(have) a party to celebrat	e my father's
		birthday.		•
	_			
В.		omplete these sentences with the correct		
	1.	When we were children we	(spend) our holic	lays with our
		grandmother.		
	2.			(not/get
		up) early.		
		Ι		
		Now we		
	5.	When she arrived in Britain, she	(1	not/drive) on
		the left, but she soon got used to it		

C.	Co	omplete these sentences with t	the correct form of the verbs can, be able to, and the verb
in l	brac	ckets.	
	1.	If you try hard, you	(pass) your examinations.
	2.	I(n	ot /speak) to him on the phone for three weeks last month.
	3.	Lisa	(clean) her dress. In fact, she is wearing it today.
	4.	Maybe the Smiths	(build) a new house next year.
	5.	(do	) that you must be an expert.
	6.	The doctors	(save) my mother's life. Nowadays she is very healthy.
D.	Us	e the verb turn (in the correct	tense) with one of the prepositions: over/down/up/to
	1.	She will never	the business to Mr. Jones. He is her biggest en-
		emy and would hate to see hi	m get the company.
	2.	If you continue with this cou	rse of action, don't think you can
		me when things go wrong.	
	3.	He keeps	all the offers.
	4.	If you don't	that music, I will come in there and unplug the stereo!
	5.	I was sure I had lost my keys	s but they on the kitchen table. It
		was unbelievable.	
Ε.	Co	omplete these sentences with t	he correct form of the verbs in brackets and another verb.
	1.	She	(be good) languages.
	2.	They	(manage) to the top of Mt. Kilimanjaro,
		but it took them six days.	
	3.	Ι	(be capable) this problem by myself.
	4.	When I pass the driving tes	st, I(be able to)
		anywhere I want.	
	5.	It wasn't easy, but I	(succeed) a ticket for the
		Eminem concert.	
	6.	I spoke to her for more than a	an hour, bought her a drink, and finally
		(man	age) her phone number.
	7.		(be able to) comput-
		ers.	•
	Q	She	(not/ be capable) the situation.
	ο.		
		I have never	(be able to) his handwriting.
		I have never	(be able to) his handwriting.
		I have never	(be able to) his handwriting.

# Appendix 2. Statistics (StatView SE+Graphics)

# LEVEL TEST: CONTROL/QUIZ GROUP

	.9229	
Mean Std	l. Dev.	Std. Error
5.571 1.4	88	.252
5.606 1.4	66	.248
(	6.571 1.4	Mean Std. Dev. 6.571 1.488

#### ANOVA TABLE FOR TEST

	DF	Sum of	Mean	F-Value	P-Value	Lambda	Power
		Squares	Square				
Group	1	131.203	131.203	9.584	.0029	9.584	.879
Subject (Group)	63	862.439	13.690				
Category for test	1	141.539	141.539	56.159	>.0001	56.159	1.000
Category for test * Group	1	109.662	109.662	43.511	>.0001	43.511	1.000
Category for test * Subject (Group)	63	158.780	2.520				

Means Table for test

Effect: Category for test \* Group

	Count	Mean	Std. Dev.	Std. Err.
Control, Pre	32	9.312	3.195	.565
Control, Post	32	3.562	3.314	.586
Quizzes, Pre	33	9.485	2.313	.403
Quizzes, Post	33	13.409	2.457	.428

#### Unpaired t-test for Pre

Grouping Variable: Group Hypothesized Difference=0

Control, Quizzes					
Mean Diff.	DF	t-Value	P-Value		
.172	63	.250	.8036		

## Group Info for Pre Grouping Variable: Group

Count Mean Variance Std. Dev. Std. Error Control 32 9.312 10.206 .565 3.195 Quizzes 33 9.485 5.351 2.313 .403

#### Unpaired t-test for Post

Grouping Variable: Group Hypothesized Difference=0

Control, Quizzes					
Mean Diff.	DF	t-Value	P-Value		
3.847	63	5.327	<.0001		

Group Info for Post Grouping Variable: Group

	Count	Mean	Variance	Std. Dev.	Std. Error
Control	32	9.562	10.980	3.314	.586
Quizzes	33	13.409	6.038	2.457	.428

#### Resumen

Este artículo tiene que ver con el "testing effect", el cual se refiere al aumento de aprendizaje que se produce como resultado de realizar tests (Halamish & Bjork, 2011; Karpicke & Roediger, 2008; Roediger, Agarwal, McDaniel, & McDermott, 2011). El propósito es comprobar con un diseño Preprueba/Posprueba si los quizzes pueden ser una herramienta eficaz para el aprendizaje, en un ambiente de aprendizaje de lengua extranjera, debido a la repetición de estas pruebas. Numerosas publicaciones tratan con el uso de quizzes y conceptos en diferentes disciplinas (Bälter, Enström, & Klingenberg, 2013; McDaniel, Wildman, & Anderson, 2012), sin embargo, esta investigación va más allá porque es la primera vez que el efecto de los quizzes se ha comprobado de manera experimental con verbos y expresiones modales del inglés. El resultado de esta investigación beneficia a los profesores de idiomas y apoya la eficacia a largo plazo del uso de quizzes en clase cuando se aprende una lengua extranjera.

> Palabras clave: quizzes, testing effect, enseñanza del inglés, aprendizaje del inglés, inglés como lengua extranjera

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