

# Effective vocabulary acquisition strategies employed by Ecuadorian teachers and students: A cooperative experience using a flashcard web application

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## Abstract

The present Action Research report describes the vocabulary acquisition strategies of a team of English language teachers and students at an Ecuadorian university. They took part in an international online vocabulary learning tournament using a digital flashcard web application called WordEngine. During the four-week competition, the team employed a range of discovery and consolidation strategies for vocabulary acquisition. Quantitative data were collected by an adapted survey based on Schmitt's (1997) taxonomy, while qualitative data were gathered from interviews conducted with the teachers. The quantitative data related to vocabulary development were supplied by the tournament organizers and are based on the Correct Responses (CRs) given by the team members while carrying out Meaning Definition Tasks (MDTs). These data suggest that, as a result of participating in the tournament, the eight contestants noticeably improved their listening and reading comprehension skills and also expanded their receptive vocabulary size under the specific conditions of the time-constrained, competitive setup. The Action Research project was accomplished under the unprecedented circumstances of the global coronavirus pandemic in 2020, which created extremely difficult conditions for students and teachers in Ecuador. The teacher-researchers conclude that in the global 'new reality,' computer-assisted language learning (CALL) methods, including web-based applications, have the potential of being employed as an alternative strategy in remote learning, especially in the area of vocabulary development.

**Keywords:** Digital flashcards, online vocabulary learning applications, vocabulary acquisition strategies

## 1. Introduction

Mastering vocabulary in an additional language is one of the most important goals for learners, and they are well aware of this prerequisite for comprehending or uttering much at all. As Krashen (1989) points out: "Second language acquirers know this; they carry

dictionaries with them, not grammar books, and regularly report that lack of vocabulary is a major problem” (p. 440). These days, learners probably have their smartphones and any other portable appliances on them when they want to look up a word (Browne & Culligan, 2008); however, neither dictionaries nor mobile phones can magically transport vocabulary knowledge into our brains. Recognizing words and learning them ‘by heart,’ which can result in production and not just recognition, is a long-drawn affair and is a several decade-long task even for native speakers (Nation, 2013).

With the advent of the lexical approach (Lewis, 1993) and owing to eminent scholars such as Paul Nation and Norbert Schmitt, who have been studying vocabulary acquisition for decades (Barclay & Schmitt, 2019; González Fernández & Schmitt, 2017; Nation, 2006, 2013; Schmitt, 2014), the issues of how this task could be made more manageable for second, especially foreign language learners, have become an intense focus of study. The questions posited include how many words there are in English, which ones are more useful for learners than others, and in what order those high-frequency words should be taught (Browne, 2019; Vilkaitė-Lozdienė & Schmitt, 2019) underlining what Wilkins (1972) stated decades ago: “Without grammar very little can be conveyed, without vocabulary nothing can be conveyed” (p. 111).

Even though there are still debates on what constitutes a word, the general consensus is that a relatively small number of words (word families) cover an extraordinary proportion of text and speech, and there are practical ways to create the conditions for incidental and intentional (deliberate) vocabulary acquisition (McLean et al., 2013; Nation, 2020).

The pedagogical implications involve both language learning strategies (Oxford, 1990) and specific strategies that learners can apply to vocabulary acquisition (Schmitt, 1997). There have been various attempts at creating a detailed taxonomy for these strategies (Gu, 2003; Schmitt, 1997; Zhang & Li, 2011), which might be different depending on whether a learner encounters the word for the first time or starts incorporating it using consolidation strategies. Nevertheless, vocabulary experts have identified a large number of strategies that might be helpful for learning words as well as multiword units, such as polywords and chunks (Tian, 2014).

## **1.1 The Problem**

The authors of the present report began exploring vocabulary acquisition within an Action Research mentoring scheme, which started in December 2019, a few months before the COVID-19 crisis hit Ecuador. We noticed in our classrooms that the strategies (e.g., vocabulary lists, bilingual dictionaries) that we employed for vocabulary learning were not effective. Students would use the word during the lesson but could not recall it or its meaning in the next.

The exploratory stage of the project focused on establishing what vocabulary strategies students might be using and if online resources could be an attractive option for ‘digital natives,’ namely millennials who are familiar with digital technology from an early age. This phase was carried out because Exploratory Action Research (Smith & Rebollo, 2018) encourages the preliminary investigation of the status quo before any intervention is decided on. However, when in March 2020 the quarantine regulations came into force

in Ecuador, the accomplishment of the second phase of the Action Research project, i.e., gathering data from the new cohort of second semester students and designing an intervention, became impossible. Taking advantage of a rare opportunity, the authors found an innovative way of exploring *their own vocabulary acquisition processes* by signing up for an international vocabulary challenge tournament. They became part of an eight-member group of teachers and students, who competed for a four-week period using WordEngine, which is a web application developed by the organizers of the tournament.

The present Action Research report looks at the vocabulary learning strategies the contestants used during the tournament. We provide an account of the context and the background as well as review some recent research related to our topic. The data analysis and the discussion sections contain the results and the interpretation of our findings. To conclude, we take a critical look at the knowledge we gained about vocabulary teaching and learning and reflect on how the results will inform our future teaching.

## 1.2 Context and Background

English is considered as a foreign language in the Ecuadorian context, which means that there is no support for its acquisition or active use outside the classroom. It is taught from the second grade to the senior year of high school in the public educational system (to students aged 6-18); whereas in the private system, English is included starting at Pre-K level (aged 3-5). The Ecuadorian National Curriculum incorporated English as a foreign language among the core curriculum subjects in public elementary education in 2016. By the end of their senior year, students are expected to reach a B1 level of English proficiency (Ministerio de Educación, 2016).

Education First (EF) published the results of an international evaluation of English proficiency in 2019. The ranking of Ecuador was 81 out of 100 in comparison with other countries around the world. Ecuador has a very low English proficiency with 46.57/100 points, making it the country with the lowest English proficiency in the Latin American region, i.e., ranking 19<sup>th</sup> out of 19 (Education First, 2019).

Although the national curriculum calls for a learner-centered approach to language teaching and learning, Paredes et al. (2018) argue that English language teachers need to have more language and methodology training to improve their students' learning. Burgin and Daniel (2017) carried out an exploratory case study in a public high school in Ecuador using a classroom observation checklist and two open-ended questions. The purpose of that study was to identify the ways in which nine EFL teachers in an urban setting conducted their teaching practice. Their findings revealed that the teachers did not allow students to take responsibility for their linguistic performance and play an eminent role in their own learning.

Even though Burgin and Daniel's (2017) study may not be representative of the whole of the Ecuadorian education system, their findings might show the reality in the country's educational contexts. Therefore, under the extraordinary conditions of the COVID-19 pandemic, the university teachers and future teachers involved in this Action Research project decided to explore a specific language teaching-learning issue, namely acquiring vocabulary through a web-based online application.

### 1.3 The Mentoring Project and the COVID-19 Situation in Ecuador

In late 2019, the University<sup>1</sup> decided to run an Action Research mentoring project for its English language teaching staff in order to support classroom research and the teachers' own research and mentoring activities related to their role as supervisors of their English major students' Action Research projects.

As an introduction to classroom research (Smith & Rebolledo, 2018), the participants split into three groups and started an exploratory phase. One of these groups was looking at how learners might retain vocabulary more effectively. They explored various ways of establishing students' vocabulary size and were awaiting the start of the second semester of the academic year so that they could find out if the incoming students had similar concerns as the ones who participated in the exploratory phase.

Owing to a national debt crisis, Ecuador had already been in a precarious economic situation even before the first case of the coronavirus was confirmed on 29<sup>th</sup> February 2020. Then on 13<sup>th</sup> March, the first Ecuadorian victim of COVID-19 died; and on 17<sup>th</sup> March, the country went into lockdown. Student registration for the second semester was delayed, and owing to the unprecedented economic and health crisis, all officials were asked to take a pay cut by the Ministry of Finance. The University faced the challenge of severe budget cuts; as a result of which, the then rector was forced to resign. Dozens of teachers were laid off (the English team lost three teachers), and most of those who stayed behind were put on part-time contracts. All staff, including the remaining English language teachers, had to switch to online delivery at short notice and teach classes with more students than before. Release time for research was withdrawn and the carrying out of any kind of classroom research seemed unfeasible. It was then that an extraordinary opportunity occurred.

At the end of March 2020, one of the coauthors spotted that an online and mobile cooperative learning vocabulary tournament was soon starting (EFLtalks Italy, 2020), and after confirming that the prospective teams can include both teachers and students, a group of five teachers and three students decided to register. The decision was based on the argument that under the conditions of forced isolation, this small group could explore their own vocabulary learning strategies: the teachers could step into the learners' shoes while the students (themselves prospective English language teachers) could reflect on what vocabulary acquisition strategies they might be using in a competitive situation when speed and, therefore, automaticity (Browne, 2008) are key.

On 3<sup>rd</sup> May 2020, after four weeks of intense competition, the winners were announced: the University's team came first in the international contest with 38 teams from seven different countries. Beyond the individual vocabulary size gains and the experience of teachers and students working together on a cooperative task, the first prize awarded to the team meant that all members of the university community were able to start using WordEngine and work on the expansion of their English vocabulary.<sup>2</sup>

What were the vocabulary acquisition strategies that the teachers and students applied in order to become champions? Were there any differences between the students' and the teachers' strategies? What are the participants' reflections on vocabulary learning that team members can build on if and when they return to face-to-face classes either to teach or to learn? Before making an attempt to answer these questions, we provide a short summary

of the theoretical background and an overview of some of the recent studies that have been carried out in this field.

## 1.4 Literature Review

Learning a language involves the development of various skills and subskills, and a pivotal one is vocabulary (Crystal, 2019). Richards and Rodgers (2014) highlight the importance of words and multi-word combinations as a way to facilitate language learning through the explicit teaching of vocabulary. Researchers in linguistics (Browne, 2013; Browne et al., 2013; West, 1953) have long been aware of the necessity to help English language learners increase their lexis to close the gap between the number of words native speakers know and the number of words that language learners need. For instance, Nation (2013) states that well-educated native speakers know about 20,000 word families. This means that on average, native speakers probably increase their vocabulary by about 1,000 words over the early years of their lives. Barclay and Schmitt (2019) reckon that language learners need to know about 8,000 to 9,000 words for reading and between 2,000 to 3,000 words for listening. However, Crystal (2019) stresses that in foreign language teaching programs around the world, there is a need for a serious semantic structural approach to teach and learn vocabulary.

Nation (2013) claims that there are three levels in learning strategies. The general learning strategies are the head of the categories. Under this macro category, there are the language learning strategies (LLS) with a subcategory of vocabulary learning strategies (VLS). Oxford (1990) defines language learning strategies as “specific actions taken by the learners to make learning easier, faster, more enjoyable, more self-directed, more effective and more transferable to new situations” (p. 8).

### 1.4.1 Relevant Studies on Vocabulary Learning Strategies

The benefits of the implementation of VLS in language programs include helping learners decide how they would like to deal with new words (Schmitt, 2000), take more control of their own learning so that they can take more responsibility for their studies (Atkinson, 1972; Nation, 2013; Woolard, 2000), and increase the excitement related to the development of vocabulary through the selection of items organized into relationships in a personal way (Woolard, 2000).

There is a variety of taxonomies that classify vocabulary strategies. This study will use the taxonomy developed by Schmitt (1997). Schmitt divides VLS into two main types: discovery and consolidation. Under the discovery strategies, one finds determination and social strategies. The second type of strategies refers to consolidation strategies, which are subdivided into social, memory, cognitive, and metacognitive strategies.

Researchers in EFL contexts similar to the Ecuadorian setting have used Schmitt's taxonomy (Alahmadi et al., 2018; Baskin et al., 2017; Yeh & Wang, 2004). Alahmadi et al. (2018) researched the impact of different vocabulary learning strategies and learning styles on the vocabulary size of 49 Arabic-speaking students in higher education in Saudi Arabia. The results indicated that there is a correlation between the frequency of applying VLS and vocabulary size, irrespective of the students' educational level. Baskin et al. (2017) found that beginner learners in Turkey use determination strategies the most and cognitive strategies

the least to learn vocabulary. Yeh and Wang (2004) compared the strategies used by good and poor Taiwanese learners and concluded that good learners use memory and cognitive strategies the most and with a higher frequency in comparison to poor learners.

Online applications help increase learners' motivation and engagement, and the effectiveness of language acquisition, and they broaden opportunities for varied learning contexts. In this section, we will refer to studies that focus on VLS development through applications (apps). For instance, Fageeh (2013) studied if apps can enhance vocabulary learning and motivation to acquire vocabulary. The results showed that the students using apps acquired more vocabulary words than the ones who did not. The same result was observable in the motivational scale. Participants felt that using apps such as WhatsApp, online dictionaries, and text messaging increased their motivation to learn vocabulary.

In addition, Rezaei et al. (2013) analyzed the performance of intermediate-level English language learners in EFL contexts. Results showed that using apps helped increase the learning of vocabulary, but it also raised confidence levels and class participation because students felt comfortable with the use of multimedia in education.

Ashcroft et al. (2018) compared the effects of using paper flashcards and digital flashcards to learn vocabulary. In this study, digital flashcards were obtained through Quizlet. The results showed that digital flashcards were more effective than paper flashcards in learners with basic and intermediate English level, whereas learners with a high level of proficiency used both types of flashcards to learn vocabulary successfully.

Bytheway (2015) studied the VLS employed by six English learners while playing the video game called World of Warcrafts. Analyzing observations, semi-structured interviews, and emails, Bytheway found that the most favored strategies were reading pop-ups during the game, looking for words in Google, word repetition, interacting with players, guessing from context, receiving and giving feedback, as well as using the word.

Makoe and Shandu (2018) conducted a research project in an Open Distance Learning (ODL) environment in South Africa. The purpose of the study was to design and implement a mobile-based application called VocUp to improve English vocabulary teaching and learning. Among the most noticeable benefits of using mobile-based applications is that learners feel comfortable with a known tool, namely their cellphones. However, the authors argue that some learners might reject the idea of using apps when there is a lack of or limited access to internet connection.

Several studies suggest that cooperative learning strategies support vocabulary learning in foreign language contexts (Ercan Demirel, 2019; Er & Azap, 2013; Trimastuti, 2016). Ercan Demirel (2019) found that participants who learnt vocabulary recognition through Cooperative Learning activities had better results in comparison to the ones who experienced traditional instruction. Similarly, Er and Azap (2013) claim that cooperative learning activities based on Multiple Intelligences Theory have a positive influence on students' vocabulary learning. Trimastuti (2016) contends that teams-games-tournament (TGT) is a Cooperative Language Teaching and Learning method that helps learners develop the ability to remember vocabulary in a creative, fun, and active way.

In the following section, we will discuss the particularities of our study and the teaching and learning opportunities that may arise from our experience of using an online vocabulary application.

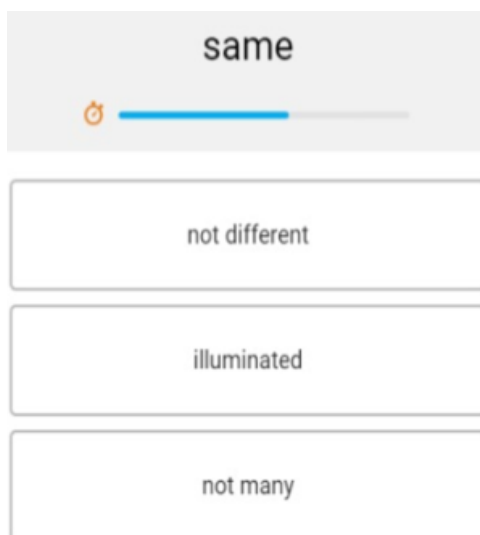
## 2. Method and Results

The main objective of examining vocabulary acquisition with the involvement of teachers and students participating in our Action Research project was to find out what vocabulary acquisition strategies they might employ and how reflecting on their practices might help the vocabulary teaching-learning process at a later stage. Under the extraordinary circumstances of COVID-19, a unique opportunity to explore these issues arose when WordEngine's Team Challenge Vocabulary Tournament was announced and an eight-member team from the University (five teachers and three students) successfully registered at very short notice.

### 2.1 WordEngine: A Vocabulary Learning Application

WordEngine is a web-based digital flashcard application, which works on the browser of the user's mobile phone or computer. In other words, it functions as an online computerized flashcard site (McLean et al., 2013) with additional gamified elements (EFLtalks Italy, 2020).

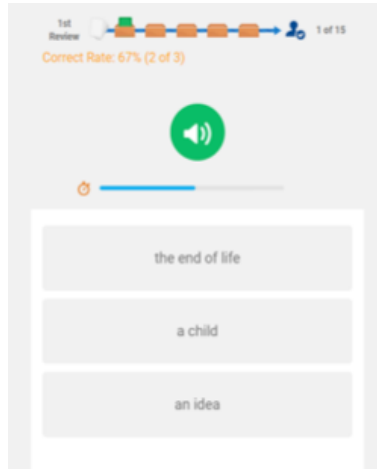
The learning of words with the help of WordEngine increases *comprehension*: the task for the learner is to identify the meaning of a word in L2 (English) by choosing one of three options that either provide a synonym or a short definition of the word in L2 (English) (see Figure 1).



**Figure 1. Screenshot of an exercise on WordEngine (Sample 1)**

Some questions (about 25%) are aural comprehension tasks; the user needs to listen to the audio, and then choose the correct answer (see Figure 2).

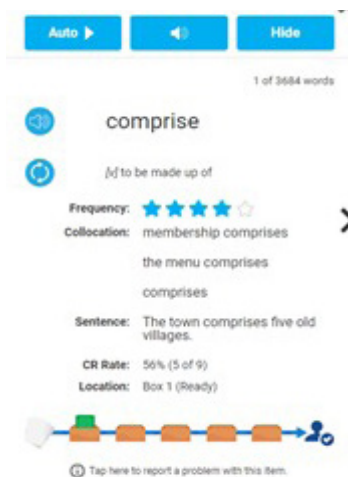




**Figure 2. Screenshot of an exercise on WordEngine (Sample 2)**

In both cases, wrong answers can be corrected within a certain time limit set for each word (the audio can also be heard several times). Furthermore, each word is uttered clearly in standard American English.

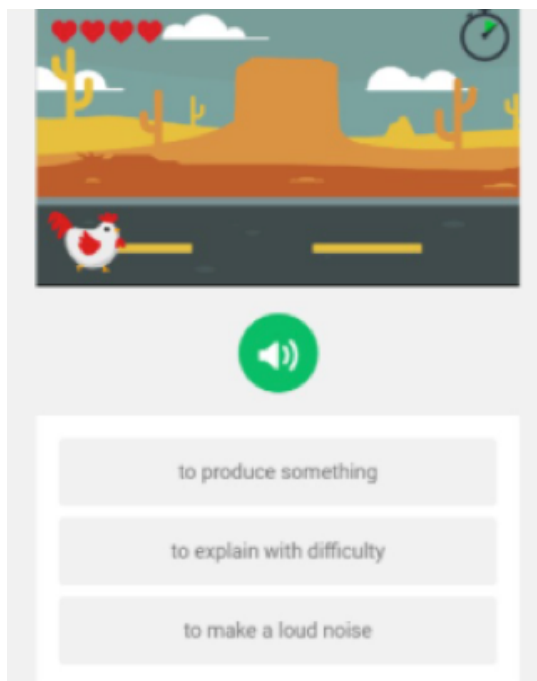
Classic, paper-based flashcards usually have the L2 (target) word on one side and the translation in L1 on the other. They often include further information on the word (e.g., pronunciation, parts of speech, sample sentence, etc.). WordEngine supplies this information in the user's personalized word list section (see Figure 3).



**Figure 3. Screenshot of word information on WordEngine (Sample 3)**



To sustain motivation, the application includes gamified elements as well. These are the so-called Word Panic games that the players can win if they supply the correct answers before time for the whole game runs out (EFLtalks Italy, 2020) (see Figure 4).



**Figure 4. Screenshot of an exercise on WordEngine (Sample 4)**

After taking a short vocabulary test (the so-called V-Check), which is a diagnostic tool to assess lexical competence, learners can start studying new vocabulary based on the specific high-frequency words which, according to the V-Check, they do or do not know (Browne, 2008; Cihi, 2018a).

## **2.2 Specific Macro Skills and Competencies Promoted by WordEngine**

The application supports the macro skills of listening and reading, more specifically listening and reading comprehension since the user needs to listen to or read the word appearing on the screen in English, decode it, and match it with the corresponding English information (synonym or short definition). In other words, L2 (i.e., the target) vocabulary is presented in a *paired associate* format where learners are required to associate the form of the L2 word with its meaning with the help of L2 synonyms or definitions (or select it from a list of L1 meanings). This type of retrieval, namely receptive recognition, is a common feature of flashcard software programs (Nakata, 2011).

WordEngine's digital flashcards satisfy three of Nation's (2013) six principles suggested for their ideal utilization: use retrieval, learn receptively (and then learn productively), and say the word aloud. The latter is not required by the task *per se*, but our data suggest that the contestants tended to repeat the word they heard, either instinctively or using it as one of their memory strategies in the consolidation phase. Saying the word aloud strengthens the connection between the sound of the word and its form as well as offers the opportunity to produce the acoustic form actively.

### 2.3 Features of Cooperative Strategies in a Competitive Setting

WordEngine had been conducting individual study tournaments, but they found that even though some students had studied hundreds of words, others remained unmotivated. In 2019, WordEngine organized their first cooperative-learning-based series of matches in line with Slavin's (1995) theory, who claimed that groups of students can study independently, at their individual levels, and still compete together as a team. Announcing the 2020 tournament, WordEngine's Support Team Leader Guy Cihí (EFLtalks Italy, 2020) stressed that in such a setup, students do not only motivate each other, but they also "...develop more interpersonal communication skills, which are lifelong social values that go way beyond just the high-frequency vocabulary."

Clearly, the need for communication during the coronavirus crisis was even more pivotal than usual: our team leader could not meet us face-to-face, but we needed to communicate about team performance and the standing of the competitors. Under the circumstances, the WhatsApp messages, to which we will refer to briefly below, became not only a lifeline, but the means of tactical and strategic cooperation.

In a cooperative-competitive setting, WordEngine encourages team members to harmonize their activities (when to study and for how long, how to pace themselves), as well as how to make up for each other's disadvantages or shortcomings. For example, in Week 3, one of the contestants, Joe had serious connectivity problems, so the rest of the team members set higher targets for themselves regarding the number of words they revised. Furthermore, Isabel (a highly proficient polyglot) ran out of words at her level, and the team, instead of replacing her (which they were allowed to do and could have done), decided to put in more hours and aim at an even higher Correct Response rate. As a result, the remaining members, who decided to do more than their fair share, ended up acquiring more words than the number they would have learnt if the workload had been evenly distributed. Team members were also sharing tips about word lists that allowed gaining points relatively easily (by listening and identifying utterances with their written form) and took strategic decisions about the domains whose vocabulary may have been easier for them (business, critical thinking, sociology) because of their background or previous studies.

Communication between team members was mainly conducted via the dedicated WhatsApp group. The 261 messages exchanged before, during, and shortly after the tournament provided means for genuine and purposeful communication, and even for the acquisition of new vocabulary items related to competitive events ('ranking,' 'progress report,' 'average'). The messages mainly related to organizational issues and logistics (223) as well as keeping up the team spirit by cheering and encouraging each other (90).

This implies that beyond vocabulary learning, members of the team were forced to communicate meaningfully and authentically with each other (filling information gaps, cheering each other, and appreciating everyone's contribution). The nonhierarchical setup implied that the student participants were treated as equals (a fact that was mentioned several times in the students' vocabulary learning journals).

## 2.4 Creating a Level Playing Field

The WordEngine Team Challenge Vocabulary Tournament began on 6<sup>th</sup> April and lasted for four weeks until 3<sup>rd</sup> May. Almost 40 teams competed from seven countries, even though some were disqualified when, by the end of the second week, they failed to gain any points (see Appendix A). The teaching/learning profile of the University's team was disparate, but not that widely different (see Appendix B).

Undeniably, one of the team members, Isabel, is highly experienced, and she also lived in an English-speaking country for a long time. She is also someone that many would define as a 'polyglot.' Maribel and Ivy had also spent a few years in an English-speaking country, and Joe was educated in the US. Alexander and Aiden have learnt English for about 9-10 years, but both claimed that over many of those years, English was timetabled but not taught. They emphasized that their English learning only started in earnest when they either took private English classes and/or began their university studies. Catalina, for her part, stressed that she has been learning English for 22 years, the last 11 alongside teaching the language as well.

So, how was it possible to bring together such different skills and experiences in the same team without giving unfair advantage to anyone?

## 2.5 Initial Vocabulary Size and the V-Check Vocabulary Test

To make sure that there is a level playing field, WordEngine uses averages for their tournaments: each team member competes at their own level and the Correct Responses (CRs) are averaged. The contestants' initial vocabulary level is established by using the so-called V-Check vocabulary test (Cihi, 2018a). This is a diagnostic tool that can assess the size of the learner's vocabulary as well as establish the specific high-frequency words that should come next in the vocabulary acquisition process. Using the results of the V-Check test, WordEngine automatically creates personalized training plans and recycles vocabulary according to the well-established concept of spaced repetition (Cihi, 2020).

More than a decade ago, the V-Check test started out by calibrating the lexical difficulty of each word based on vocabulary task responses from people with all levels of lexical ability. The database allowed the designers to calibrate the learning burden of each word. From 2018 onward, V-Check has been using Meaning Decision Tasks (instead of the former Yes/No task in answer to the question: "Do you know this word?") to define users' coverage, which is understood as "the lexical ability of a human relative to a corpus" (Cihi, 2018a, p. 3). Taking into account the difficulty of the word combined with its frequency of occurrence, V-check is able to establish, with a high level of probability, the number of words that the respondent is familiar with. More importantly, it is able to identify the unknown

words whose study would be most useful for the student, namely those that are among the first 3,000 most frequent words.

In order to help long-term memory retention, WordEngine employs the protocol of spaced repetition, which means that “a learner must correctly identify each particular word at each of five increasing time intervals or the word gets sent back to the starting point” (Cih, 2020, p. 3). After about 90 days and five reviews, the word is considered to be retained long-term.

## 2.6 Time Spent on Task

Team members spent a considerable amount of time practicing vocabulary. Table 1 demonstrates their efforts over the four-week period. It does not provide details about *when* in the day that practice took place, but the interviews conducted with the teachers reveal that team members such as Catalina and Maribel, who had to give online classes during the day as well as provide their children with home schooling and carry out the usual tasks of running a household, often stayed up for several hours at night.

**Table 1**  
*Number of hours team members spent practicing*

	Week 1	Week 2	Week 3	Week 4	Total Number of Hours	Correct Responses (CRs)	Rank on Last Day (3 <sup>rd</sup> May 2020)
<b>Teachers:</b>							
Catalina	02:34:33	06:03:12	04:03:23	11:57:11	24:38:19	13 255	5
Isabel	04:36:56	05:39:28	03:48:59	02:33:42	16:39:05	10 010	12
Ivy	06:19:10	09:08:59	05:52:08	10:43:08	32:03:25	16 865	3
Maribel	05:40:31	05:49:06	04:58:02	05:46:52	22:14:31	12 544	7
Mathew	04:24:15	06:56:25	03:56:51	07:01:47	22:19:18	11 393	10
<b>Students:</b>							
Aiden	03:09:02	07:12:15	06:25:33	11:12:43	27:59:33	12 705	6
Alexander	12:07:28	07:28:15	07:37:25	14:39:06	41:52:14	17 900	2
Joe	07:19:05	07:35:18	00:32:43*	07:40:10	23:07:16	9 841	13
<b>Total</b>	<b>46:11:00</b>	<b>55:52:58</b>	<b>37:15:04</b>	<b>71:34:39</b>	<b>210:58:41</b>	<b>104 513</b>	

**Source:** VAdmin data (WordEngine)

\*Joe had serious connectivity problems in Week 3.

Agawa et al. (2011) found that students do not universally like using WordEngine. In a study conducted at a private Japanese university, they found that almost 40% of second-year students disliked using the application. It is quite probable that however long they were required to practice, they were unlikely to actively engage with the application (and reach a higher rate of CRs). In our case, the team members felt they had no such option. Their ‘social motivation,’ i.e., the drive to come first and win thousands of free accounts for their institution, obliged them both to spend an extraordinary amount of time on playing as well as trying to get the highest number of Correct Responses since it was the *average* of these that defined the weekly performance of each team and gained another match point or not. The time spent on practicing resulted in a considerable expansion of the team members’ vocabulary size (based on recognizing words and selecting the right answer from among three options).

WordEngine also assesses lexical ability measured in several English language proficiency exams, and the improvement in that regard is also included below. Scatter plots and correlation analysis produced by WordEngine based on 7,500 English language proficiency test scores have shown 0.81 correlation between the respondents’ calculated vocabulary size and their standard test scores. The researchers stress that V-Check scores are based on average scores, and a higher degree of variation is possible depending on the learner’s listening and reading speed (Cih, 2018b).

**Table 2**

***Team members’ vocabulary recognition expressed in terms of language proficiency test scores***

	Vocabulary at Start	CEFR	IELTS	Vocabulary at End	CEFR	IELTS
<b>Teachers:</b>						
Catalina	8,615	B1	5.7	13,073	C1	7.0
Isabel	11,379	B2	6.8	14,208	C1	7.0
Ivy	6,453	B1	4.9	11,061	B2	6.3
Maribel	8,548	B1	5.7	12,274	B2	6.8
Mathew	4,216	A2	4.2	7,955	B1	5.3
<b>Students:</b>						
Aiden	1,094	A1	3.4	4,101	A2	4.0
Alexander	5,509	A2	4.6	9,950	B1	7.0
Joe	7,065	B1	5.2	9,675	B2	6.1

**Source:** VAdmin data (WordEngine)

According to the V-Check test scores established at the beginning and the end of the tournament, all members of the team were able to raise their lexical knowledge by one level according to the Common European Framework of Reference (CEFR) (see Table 2). One team member, Catalina, moved up from B1 to C1.

It is to be noted that these results reflect the participants' achievements at a certain point after weeks of intense practice and, primarily, represent improvement in listening and reading comprehension skills rather than the full spectrum of linguistic ability. However, as discussed earlier, flashcards, which set paired associate learning tasks for users, allow the memorization of large number of words over a short period (Browne, 2008).

## 2.7 Vocabulary Acquisition Strategies Survey

After the tournament, the team members were asked to fill out a survey, which was based on Schmitt's (1997) taxonomy, but was adapted to focus on strategies the contestants specifically used during the vocabulary challenge. The list was modified to reflect the special circumstances of a time-stressed, competitive situation where certain strategies were not applicable (e.g., social strategies, dictionary use during the discovery phase).

Let us start with the strategies that teachers and students used when they first encountered a word. Here, and throughout the rest of the paper, we are using 'vocabulary acquisition strategies' and 'vocabulary learning strategies' interchangeably (following Schmitt, 1997).

**Table 3**

*Determination strategies used by participants in the discovery phase*

<b>Discovery Strategies</b>	Total number of participants: 8	Total number of teachers: 5	Total number of students: 3
<b>Determination Strategies</b>	All	Teachers (advanced learners)	Students (beginners/intermediate learners)
Analyze part of speech	T1, T2, T4, T5	4	0
Analyze affixes and roots	T1, T2, T4, T5	4	0
Check for L1 cognate	T1, T2, T3, T4, T5	5	0
Guess from textual context	T2, T4, T5, S1, S2	3	2
Flashcards	T5	1	0
Relate new word to a word in an additional language you know (not L1)*	T2, T4	2	0

**Source:** Questionnaire based on Schmitt (1997) and adapted by the coauthors

**Notes:** T = teacher; S = student

\*Not listed in Schmitt's taxonomy

According to the data in Table 3, determination strategies were mainly used by teachers/advanced learners. Even though our sample is small and, therefore, the results are not generalizable, we might conclude that beginner and intermediate learners are not confident discovering language through analyzing words and their etymology probably because they do not have the linguistic tools to do so.

One noteworthy aspect is the fact that the most popular vocabulary learning strategy used by advanced learners was to look for the correspondence between the new words and their possible cognates in their L1, which is understandable owing to the high number of words in Spanish and English that have the same Latin or Greek root, especially in General Academic Language (Lubliner & Hiebert, 2011). Related to this, we identified a strategy that we felt might be useful to add to Schmitt's (1997) taxonomy, and this is the strategy of resorting to one's additional languages (beyond the mother tongue and English). In our case, some participants speak more than two languages; in fact, one of them, Isabel, is an advanced plurilingual. Therefore, she went beyond relating the new words to cognates in her L1 since, in her particular case, she was able to resort to the knowledge of her other languages as well.

She provided a self-report on this aspect noting that her mother tongue is Hungarian; she speaks English, Spanish, Modern Greek, and Russian and also learnt Latin. In the recognition phase, she correctly guessed the meaning of words such as 'heptagon' as a polygon with seven sides and seven angles, since 'hepta' means seven, and 'gonos' means angled. Likewise, she found it fairly easy to guess that 'levity' from the Latin word 'levitas' means 'lightness' even though 'levity' in English has the added meaning of 'lack of seriousness,' or 'light-heartedness.'

In the interview, Maribel, who is not fluent at all in other languages, recalled that she found it useful to relate new words that have no cognates in her L1 to words she knew in other languages from sporadic contact with movies, songs, and her former international students.

When we asked Norbert Schmitt about this approach, he emphasized that "there are many ways of learning vocabulary, and everybody has a slightly different background and variety of resources they can call upon" (personal communication, July 10, 2020). He added that the approach mentioned above may belong to the discovery or the consolidation stage depending on whether one is identifying or memorizing the word. If one was to create a list based on these correspondences, it could even be identified as a cognitive strategy.

Schmitt stressed that what he finds more important nowadays is to focus on the effectiveness of strategies and added that, "In the end, I think it is *control* learners have over their learning that is important (i.e., using the right strategy(ies) for the particular learning context), rather than what *particular strategy(ies)* they use" (personal communication, July 10, 2020, emphasis added).

Catalina talked about the fact that she inherited her love of words – and her good Spanish-speaking and -writing skills – from her father as she spent a lot of time digitalizing what he had written: "I was transcribing some of the things he wrote, ... and I learned many new words in Spanish. ... I think Academic Spanish has a lot of Latin words and that's why I could relate words from English to Spanish." Catalina also looked at the roots of the words and then analyzed the prefixes and the suffixes, but she was careful with cognates saying: "... sometimes in Spanish we have false cognates with English."



Finally, Mathew, who has a keen interest in technology and business (as well as critical thinking), also looked at the similarities in English and Spanish: “At the beginning my strategy was to compare because some of the terminology that you have in the vocabulary in business and economics is very similar in Spanish and English.”

Let us now look at some of the memory strategies that team members used to consolidate their knowledge of the words that the application invited them to recognize.

As indicated in Table 4, the most frequently used memory strategies by beginner, intermediate, and advanced learners were related to the sound of the words, while the least used ones were grouping words together, mapping them, or placing them spatially in graphics such as timelines, scales, grids, and storylines. It is possible that learners at all levels of proficiency find it easier to relate meaning to the sound of the words to consolidate their vocabulary acquisition rather than resorting to more complicated and lengthier memorization tools. However, it is worth highlighting the fact that all students connected the meaning of new words to previous experiences when they encountered words with different meanings. For example, Aiden described that when he met a word with more than one meaning, he related the options given by the application to his own life experiences and background.

Isabel is a proficient speaker of English; therefore, based on her V-Check test results, the application was giving her words from the top 10% of the English vocabulary, so she had to resort to various means of remembering these low-frequency words. One way she did it was by association: for example, she related ‘demurrage,’ which means ‘the fee that must be paid if a ship is used for longer than agreed,’ to ‘demorar,’ which means ‘to delay’ in Spanish. She related ‘rapine’ (pillage, plunder) to ‘rape’ and ‘dyne’ (a unit of force) to ‘dinamó’ in Hungarian rather than the English word ‘dynamo’ (generator).

**Table 4**  
*Memory strategies used by participants in the consolidation phase*

<b>Consolidation Strategies</b>	Total number of participants: 8	Total number of teachers: 5	Total number of students: 3
<b>Memory Strategies</b>	All	Teachers (advanced learners)	Students (beginners/intermediate learners)
Study word with a pictorial representation	T5, S2	1	1
Image words meaning	T3, T4, T5, S2	3	1
Connect word to a personal experience	T1, T3, T4, T5, S1, S2, S3	4	3
Connect the word to its synonyms and antonyms	T1, T4, T5	3	0
Use ‘scales’ for gradable adjectives	T5	1	0
Peg Method	T5, S2	1	1

Table 4 continued...

<b>Consolidation Strategies</b>	Total number of participants: 8	Total number of teachers: 5	Total number of students: 3
<b>Memory Strategies</b>	All	Teachers (advanced learners)	Students (beginners/intermediate learners)
Loci Method	T5, S2	1	1
Group words together to study them	T5	1	0
Group words together spatially on a page	T5	1	0
Use new word in sentences	T3, T4, T5, S1, S2	3	2
Group words together with a storyline	T5	1	0
Study the spelling of a word	T2, T3, T4, T5, S1, S2	4	2
Study the sound of a word	T1, T2, T3, T4, T5, S1, S2	5	2
Say new word aloud when studying	T1, T2, T3, T4, T5, S1, S2	5	2
Image word form	T5, S2	1	1
Use the Keyword Method	T3, T4, S1	2	1
Affixes and roots (for remembering)	T1, T2, T4, T5	4	0
Part of speech (for remembering)	T2, T4, T5	3	0
Paraphrase the word's meaning	T3, T4, S1	2	1
Use cognates in study	T1, T3, T4, T5, S1	4	1
Learn the words of an idiom together	T3, T4, T5, S1	3	1
Use physical action when learning a word	T3, T4, T5, S1	3	1
Use semantic feature grids	T5	1	0

**Source:** Questionnaire based on Schmitt (1997) and adapted by the coauthors

Next, we will look at the cognitive and metacognitive strategies used by teachers and students during the tournament.

**Table 5**  
*Cognitive strategies used by participants in the consolidation phase*

Cognitive Strategies	All	Teachers (advanced learners)	Students (beginners/ intermediate learners)
Verbal repetition	T1, T3, T4, S1, S2	3	2
Written repetition	T2, S1, S2	1	2
Word lists	T2, T4, S1	2	1
Flashcards	T2, S2	1	1
Keep a vocabulary notebook	T2, S1, S2	1	2

**Source:** Questionnaire based on Schmitt (1997) and adapted by the coauthors

Based on Table 5, it can be seen that cognitive strategies were mostly used by beginner and intermediate learners. However, it is important to point out that verbal repetition was more likely used by advanced learners, which is consistent with the information in Table 4 about memory strategies to consolidate learning. With regard to word lists, two teachers and one student decided to use them. Isabel created her word list in the second week when she realized that she could not remember the words any other way. Her list contains 109 low-frequency items such as ‘obsequious’ and ‘propitiatory,’ to which she attached short definitions and associations, often in her additional languages.

Maribel first just jotted down the words she thought she needed to remember in the notebook she keeps with her at all times to remind her of the homework that her students send her; so initially, the words that came up again and again were not on the same page. At some point, she decided to write a proper word list: “I had my words everywhere, sometimes here, sometimes there. Then, when the words became harder, I knew I had to put my words together like in one single place, and then I did that. ... I also wrote down whether it is a verb or an adjective because before I wasn’t doing that.”

Aiden created a word list of 724 items. He started his list on the second day of the competition and practiced his words by verbal repetition every day, which helped him move from beginner to intermediate level in General English.

As regards metacognitive strategies, these were basically inherent elements of the online application (see Table 6). WordEngine presents words according to the principle of spaced repetition (Cihri, 2020), which helps combat vocabulary loss through forgetting (Dellar, 2020). Each round in the vocabulary challenge offered the opportunity of testing oneself using spaced word practice. It also forced contestants to skip or pass new words to save time while it also nudged them to continue to study between sessions.

Teachers used spaced word practice (spaced repetition) as the most relevant metacognitive learning strategy while, owing to time constraints, all contestants skipped or passed some new words when they encountered them because the WordEngine application provided opportunities repeatedly to get the word right.

**Table 6**  
*Metacognitive strategies used by the participants in the consolidation phase*

Metacognitive Strategies	All	Teachers (advanced learners)	Students (beginners/ intermediate learners)
Testing oneself with word tests	T5, S2	1	1
Use spaced word practice (spaced repetition)	T2, T3, T4, T5, S1	4	1
Skip or pass new word	T3, T4, T5, S1	3	1
Continue to study word over time	T4, T5	2	0

**Source:** Questionnaire based on Schmitt (1997) and adapted by the coauthors

When interviewed, the teachers also reflected on the metacognitive strategies they used: Mathew realized early on that the words he missed in the previous round would come back as the first words in the next, so he made an effort to store those words in his short-term memory without much thinking and then looked at the same words in more detail when he saw them again. He also appreciated the WordEngine feature that allowed vocabulary expansion by presenting the same word with different meanings: "... another good thing about the strategy that they apply through the platform is that they use different meanings for the words ... so that expands your vocabulary." Since the time factor was important, Maribel used the familiar metacognitive strategy of eliminating unlikely options: "I became faster because I kind of eliminated the options that didn't sound right. I was like I have two seconds to see the words and two seconds to see the options. I became faster with that."

### 3. Discussion

Having looked at the various vocabulary acquisition strategies employed by the group members, in this section, we examine the elements that led to successful vocabulary acquisition and, ultimately, to the team winning the tournament.

Let us return to the research questions and discuss our findings.

1. What were the vocabulary acquisition strategies that the teachers and students applied in order to become champions?
2. Were there any differences between the students' and the teachers' strategies?

With regard to the first question, we found that the team members altogether employed 33 out of the 59 vocabulary learning strategies listed in Schmitt's (1997) taxonomy. We added one that was used as a determination strategy by two of the contestants, who relied on their knowledge of languages other than their mother tongue and English (L1 and L2) when looking for cognates. From among the discovery strategies, both teachers and students

used guessing from textual context. They also utilized the following memory strategies: connecting words to a personal experience, using the new word in a sentence, studying the spellings and sounds of words, and saying them aloud when practicing. With respect to the use of cognitive strategies, verbal repetition, which is the most frequently used strategy, was applied by all members of the group.

As for the second question, we found that the teachers used determination learning strategies more frequently than the students. The most common strategies used by the teachers were: analyzing parts of speech, and affixes and roots; and checking for L1 cognates. This might be due to the fact that since teachers are advanced learners, they are more aware of word etymology than their students. This finding aligns to what Siegelman and Arnon (2015) found in their study where adults' prior knowledge on VLS led them to rely less on multiword units (natural way of learning languages), and more on segmented language learning strategies. We suggest that as language teachers, it is important to be aware of the wide range of existing VLS and, at the same time, be thoughtful about selecting them wisely to help learners develop their own.

Pertaining to metacognitive strategies, all participants experienced vocabulary learning through spaced repetition while competing in the WordEngine tournament; but surprisingly, it was only the teachers who were aware and took advantage of the scoring potential of spaced word practice (keeping words in their short-term memory and waiting for wrongly identified words to reappear). This is noteworthy because the application itself is built on the principle of spaced repetition (Cihî, 2020). Since the latter is one of the most effective ways of retention (Browne & Culligan, 2008; Nation, 2013) and WordEngine's gaming strategy requires conscious attention paid to this aspect, we consider that the teachers' awareness of this specific vocabulary learning strategy helped us win the competition.

### **3.1 Limitations**

The present Action Research report was not set up as a piece of applied linguistics research; as a result, its generalizability is necessarily limited. It reflects the opportunity-driven attitude of its participants, whose options were seriously constrained by the extraordinary conditions of a global pandemic (COVID-19). Hence, the customary pre-test was replaced by the online vocabulary learning application's own V-Check test, and the post-test results were also provided by the system's administrators. However, our account was primarily aimed at describing and identifying the vocabulary learning strategies that the eight contestants employed during the tournament; while establishing that, as a result, our team came first by achieving the highest average number of Correct Responses over a four-week period. Perhaps, the fact that the team involved both teachers and students might seem unorthodox, but under the time pressure to sign up and with no students to surface before the deadline, we had no other option. We believe that this setup actually helped generate interesting data and a realization that throughout the contest, the team members functioned nonhierarchically, perceiving and treating each other as lifelong learners at different stages or levels of foreign language vocabulary acquisition.

### 3.2 Reflection

Each of us gained a lot of practical and theoretical knowledge about vocabulary learning strategies and cooperative teamwork. We came to understand that vocabulary can be learnt cooperatively in a setup that allows learners to work together competitively in multilevel classes. As teachers, we became aware of the fact that students and teachers can work together on an equitable basis and, on occasion, students may surpass their teachers.

Before this research project, we did not consciously reflect on how to teach vocabulary and mainly relied on our personal experience as language learners and used the standard tools (e.g., vocabulary notebooks, flashcards) and activities (e.g., explicit teaching of vocabulary in context).

During the tournament, however, we became aware of the importance of recycling, namely the need to revise vocabulary systematically. Dellar (2020) stresses that learners may need to encounter a word about 20 times, preferably in different contexts, until the word becomes part of their active vocabulary. This knowledge has given us a wider perspective on how to approach students' vocabulary learning more effectively.

It is worth pointing out that two of the teacher-researchers, Ivy and Maribel, did not only reflect on their own learning experience but acted on it as well. In her interview, Maribel recalled how she and Ivy incorporated spaced repetition in their regular classes very soon after they started using WordEngine and read some of the research behind the concept. Both teachers changed their vocabulary teaching methods in order to support vocabulary retrieval by putting more emphasis on repetition and the recycling of previously taught vocabulary. This is in keeping with Nation's (2020) recommendations: he stresses that systematic repetition, an often-neglected activity in the classroom, should be high on teachers' agenda.

Learning about online applications has widened our horizons. In fact, while we did our research, we learned about other applications with similar characteristics as WordEngine, which have been equally successful, for example, World of Warcrafts (Bytheway, 2015); Quizlet, which was used in a study by Ashcroft et al. (2018); and Vocab Victor developed by Browne (Brumbaugh, 2020).

WordEngine has a classroom game activity, and schools can arrange for their own competitions to create similar motivation. We intend to take advantage of this feature, and thereby, let students experience new approaches to vocabulary learning.

### 3.3 Successful Cooperative Strategies

Even though the present report mainly focused on vocabulary acquisition strategies, it needs to be stressed that cooperation and collaboration in the team also contributed to winning the tournament. By the end of the first week, everyone understood that each member was responsible for the success of the team, because all the individual points were added to the average score of the team. Alexander became the greatest inspiration by reaching 5,000 Correct Responses over 12 hours of practice in that first week. After reviewing the results, the rest of the team members also increased the amount of time dedicated to playing (see Table 1). One of the reasons for being engaged so deeply was due to the fact that every participant was competing at their own vocabulary level and aimed at increasing their vocabulary size

with the next batch of high-frequency words; that is, each contestant felt comfortable and challenged at the same time.

The ranking system made it possible to appreciate individual effort while the whole team was headed to victory. On the last day of the tournament, all eight members were among the first 13 players, and one of the students in the team (Alexander) was number 2 on a list of about 4,000 learners. Teachers and students highlighted the importance of this aspect since this was a feature that kept them going and provided motivation for the whole time.

Participating in the tournament kept up the spirits of all team members during the difficult period of the pandemic when they needed the kind of distraction that gaming could provide. All were keen on achieving success as a social unit of which they became integral parts, but at the same time, they wanted to win learning opportunities for the entire university, that is, a community that was much bigger than the eight of them.

#### 4. Conclusion

In the present Action Research report, we made an effort to provide an account of an experience that was quite different from ordinary classroom situations: a group of five teachers and three students came together as an *ad hoc* team to compete over four weeks in a vocabulary challenge tournament. The members of the team put in considerable time and effort to acquire and retain vocabulary. Beyond the individual goals, the group worked cooperatively and collaboratively to win the first prize, which meant a victory not only for themselves but for a larger social group – the University – as well. The tournament also gave the teacher-researchers and the students the opportunity to acquire vocabulary in a live situation, which lent a high degree of authenticity to the experience.

As a result of winning the tournament, the University received almost 3,000 licenses; thus, teachers, students, and administrative staff can use the application to practice vocabulary acquisition either as a course requirement or as a voluntary assignment.<sup>2</sup> It would be important to conduct further research related to the topic by comparing the progress and learning-strategy preferences of these different groups. WordEngine allows both the setting up of groups and the regular monitoring of students' performance, so the application can be added to the teacher's toolkit at a time when online classes constitute a huge challenge both for teachers and students.

Online applications can and will be used increasingly under the unprecedented circumstances that require social distancing, and they will, ultimately, be added to other modalities of instruction such as homeschooling, distance learning, and blended learning. Vocabulary learning in second and foreign language contexts will remain a priority, and the more tools teachers and students have at their disposal, the more successful the process will be.



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## Endnotes

<sup>1</sup>In line with the Ethical Guidelines, the name of the University is omitted. Pseudonyms are used throughout for the participants involved in the project.

<sup>2</sup>Altogether, 3,000 accounts were released on 1<sup>st</sup> June 2020 and will run for 360 days.

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## Conflict of Interest

According to the rules of the WordEngine Team Challenge Vocabulary Tournament, the first prize provided free accounts for 360 days for all students and teachers at the University. The team was also given a trophy cup, eight badges, and two certificates. We asked the organizers that the countervalue of the eight Starbucks gift cards, which were part of the first prize, be donated to a local charity in Cuenca (Hogar de Esperanza) that was providing support to vulnerable people during the pandemic. In compliance with our wishes, \$80.00 was transferred to the said foundation.

## Appendix A

### *Participating countries and number of teams in WordEngine Team Challenge*

Countries	Week One	Week Two	Week Three	Final Week
Australia	25	3	3	3 3 <sup>rd</sup> place winner: Melbourne Storm
Belarus	1	1	1	1
Ecuador	1	1	1	1 1 <sup>st</sup> place winner: the University
Japan	3	3	3	3
Mexico	6	2	1	1
Oman		1	1	1
Romania	1	1	1	1 2 <sup>nd</sup> place winner: Balcescu Eagles

**Source:** WordEngine data from the tournament organizers

**Appendix B*****Language teaching and learning profile of the contestants***

	Status	No. of Years of Learning English	No. of Years of Teaching English	First Language	Additional Languages	No. of Years Spent in an English-speaking Country
Catalina	Teacher	22	13	Spanish	English	2 months in the US
Isabel	Teacher	10	45	Hungarian	English Spanish Modern Greek Russian Latin	India: 3 years  United Kingdom: 17 years
Ivy	Teacher	10	4	Spanish	English	2 years
Maribel	Teacher	12	8	Spanish		2 years
Mathew	Teacher	25	10	Spanish	English	
Aiden	Student	11	0	Spanish	English	
Alexander	Student	10	0	Spanish	English	
Joe	Student	20	6 months	Spanish	English	19 years, high school and AA* Degree

**Source:** Data gathered by the coauthors

\*An Associate of Arts degree, comparable to the first few years of a Bachelor's degree



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