

The Receptive Vocabulary Size of Vocational Trainees at the Specialized Institute of Applied Technology in Morocco

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Abstract: This study aimed to quantitatively estimate the receptive vocabulary size of Moroccan vocational trainees at the specialized institute of applied technology and examine its relationship to their training level and the amount of L2 instruction. Meara's (2010) Yes/No test was employed to measure the receptive vocabulary size of 405 trainees from two vocational levels. The results revealed that trainees had a mean size of about 1916 words, suggesting that their vocabulary size is insufficient apropos of the lexical knowledge threshold required to understand authentic English texts. They also revealed that the training level was not related to trainees' vocabulary knowledge, but the number of years of L2 instruction positively correlated with their lexical knowledge. Recommendations were suggested to instructors, course designers, and policymakers at the vocational institutes in Morocco.

Keywords: receptive vocabulary size, vocational trainees, training level, amount of instruction.

1. Introduction

Receptive vocabulary size (RVS), or vocabulary breadth, is generally perceived as the most basic aspect of vocabulary knowledge (Schmitt, 2010), representing the quantitative property of lexical competence (Harrington, 2018). RVS is simply the number of words one knows or is able to recognize their written or spoken form and/or meaning. This dimension is developed as a function of learners' experience with language, particularly their repeated exposure to single words and word combinations that frequently co-occur in the English language (Ellis, 2002). In this respect, frequency, as counted by corpus linguistics tools, is the most reliable indicator of the receptive vocabulary size of language learners (Laufer 2001). This is especially true as a variety of empirical studies have shown that vocabulary size as a function of frequency highly correlates with different language skills and standardized language proficiency tests (cf. Milton, 2013). This renders vocabulary size estimates valuable evidence to extrapolate the performance of learners on language skills and, hence, evaluate the execution of language teaching programs and policies.

In Morocco, new educational reforms have recently been suggested by the Higher Council for Education, Training, and Scientific Research. These are published in a report entitled The Strategic Vision of Reform 2015–2030. Two of the major objectives set in this vision are (1) promoting vocational training by increasing the enrollment capacity in various institutes that are affiliates of the National Office of Vocational Training and Labor Promotion (known as OFPPT) (i.e., the specialized institute of applied technology, known as ISTA), and (2) encouraging the teaching of English as a

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medium of instruction in various educational programs, including vocational training. In the report, it is stated that English is “a teaching language for certain contents or modules introduced gradually in high school and in higher education and vocational training” (HCETSR, 2015, p. 17). In practice, however, from the training contents taught across vocational schools in Morocco, it seems that vocational schools are still relying on French as a medium of teaching content in all professional branches. Perhaps this is due to the absence of trainers who master the English language or trainees’ unwillingness to study in English. Therefore, vocational schools are confined to introducing English as a mere subject to reinforce the linguistic knowledge trainees have accumulated during secondary school studies, with the hope that it will be gradually used as a language of instruction, particularly in some branches like information technology development (software development) in which English is the language that is mostly warranted. ISTAs in Morocco provide a wide range of training programs at four levels: Specialization, Qualification, Technician, and Specialized Technician. The English language course is introduced to all branches in specialized technician level (TS). Trainees have to complete 60 hours (30 hours per each year), and take the English module final exam as one of the requirements for getting a two-year Specialized Technician Diploma. A zero/20 grade obtained in the English language midterms or end of training exams eliminates the trainees from the program (RIEFP-OFPPPT, 2012). However, it should be noted that no English textbook has hitherto been developed for ISTAs. As for the content of the course, it is up to instructors to decide on the grammatical and lexical items to be taught. Usually, the lessons to be involved in the course are selected based on teachers’ experience or items that are frequently introduced in the previous exams.

However, despite the importance of English in vocational schools, little is known about the number and kind of words these learners have at their disposal. A study conducted by Ait Hammou (2018) showed that, at the end of the school year, Moroccan 2nd-year Baccalaureate students on average know about 1,789 English words. If we assume that students join technology schools after getting their baccalaureate degree with this vocabulary size, it is not known whether the English language course at the vocational colleges helps trainees enrich their lexical repertoires at the two vocational training levels. Moreover, trainees at vocational schools have had inconsistent amounts of instruction in the English language, as some trainees join ISTA after one year or more of studying at university or in other programs, and there is no restriction on admission when it comes to the date of getting the baccalaureate degree at the technology schools. This means that an analysis of how the amount of instruction trainees have had is related to their lexical competence is clearly warranted.

The present study tries to investigate how many words specialized technician trainees know receptively and whether the lexical profiles of these learners reflect a frequency-based model of language learning. In addition, it tries to compare the receptive vocabulary size of first-year trainees and second-year trainees to examine the course's effectiveness in enhancing trainees’ lexical knowledge. Finally, given the unequal years of instruction received by trainees at university or in other programs before joining ISTA, the current study seeks to examine the relationship between the overall number of years of learning English in formal settings and the receptive vocabulary size of ISTA trainees.

Generally, there is a dearth of studies on vocabulary knowledge in Morocco. Developing a body of research on vocabulary in Morocco requires first to have a clear understanding of the receptive vocabulary size, which is the very basic dimension of vocabulary knowledge, of different categories of Moroccan EFL learners, including rarely investigated learners i.e., ISTA trainees. Furthermore, the findings might serve as a basis for pedagogical decisions, particularly, for teachers and textbook designers so that they can systematize the teaching of English in vocational schools and inform the process of selecting materials that fit students’ lexical knowledge taking into account the frequency-

based vocabulary knowledge, the vocational training level, and the variability in the amount of instruction trainees have had.

2. Review of Literature

2.1. Basic Definition

What is a word?

Instructors in writing courses usually assign writing assignments using words as a means of deciding on the length of the text to be produced by the learner. For instance, learners might be asked to write an essay of 400 words. In this type of task, a word is defined orthographically as a set of letters bounded by space or a punctuation mark in the written mode and by pauses and stress in the spoken mode (Carter, 2012). Yet, some attached sequences of letters can still be seen as composed of more than two words. Examples provided by Carter are contractions (e.g., I'll, can't, doesn't, etc.) and spelling variability of compound nouns (e.g., boxplot, box plot, box-plot). Although this orthographic definition seems practically valid, researchers tend to consider it an oversimplified theoretical account of what counts as a word (Carter, 2012).

A similar definition found in the literature on vocabulary is counting words as tokens or running words in a corpus. The British National Corpus, for example, contains about 100 million tokens. This is also an invalid definition as far as measuring one's vocabulary size is concerned, as it is pointless to count words produced repeatedly by a learner as different words in their lexical repertoire. Another way of conceptualizing a 'word' is by considering different word forms in a text as single words. The 4-token utterance today, today, and today has only two different word forms, i.e., types. A type count is convenient for identifying, say, the number of words in a dictionary (Nation, 2001). This count, however, assumes that book and books (plural of book) are two different forms, given that knowledge of the latter can be predictable when mastering the plural rule. This suggests that, similar to token count, type count focuses on the form of the word and not on the meaning carried by the word; thus, it does not seem to be useful to accurately count the number of words one knows.

A more inclusive definition is counting a base form and all the different forms it may take as one word. Consider the sentence: each week, Sarah reads one story while Sum and John read three stories. Milton (2009) suggests that words like read and reads, and story and stories are single units, i.e., Lemmas. A lemma is the base form with all its inflections, forms produced by adding an affix to a base form. Play, plays, and playing form one lemma. The reason why these forms are conceived as one unit simply lies "in the regularity of the rules by which words are inflected or derived in any language" (Milton, 2009, p. 9). Yet, in the English language, rules cannot always help generate other inflections. For instance, some past forms of some words are not always generated by the -ed rule (e.g., be to was/were, speak to spoken, etc.) (Milton, 2009). These irregular forms are learned as such and generated by rule mastery.

Another meaning-based answer to what counts as a word is considering a base form with the inflections and derivations as one word family. A word family incorporates the root form (e.g., organize), its regular inflections (e.g., organizes, organized, organizing), and its derivations (organization, organizer, etc.) (Read, 2000; Schmitt, 2010). There is a problem with this definition, as some approximately similar forms exhibit varying degrees of meaning (Read, 2000). Examples are socialization, unsociable, social, socialism, sociability, socialize, and sociable. Read (2000) notes that these cannot be counted as a word family as they show "a quite range of meaning" (p. 8).

Overall, there is no one answer to what counts as a word. It all depends on the research or the teaching objectives to opt for the convenient definition. For the purpose of the present study,

deciding on what counts as a word is important to the estimation of vocabulary size, as the wrong choice might either overestimate or underestimate one's lexical competence (Nation, 2007). In vocabulary size studies, the choice of the unit depends mainly on the level of the students and the purpose of the study. To solve this issue, we resort to Paul Nation's suggestion (cited in Schmitt 2010):

for receptive use, word families are the best unit to use, with the definition of what is included in the word family being related to the proficiency level of the participants involved...For productive use, Nation feels that the lemma, or even word form, is the best unit of counting to use. (p. 192).

Using type count will certainly lead to an overestimation since the Moroccan trainees at ISTA have been exposed to English for at least 3 years, meaning that they know the various inflectional and derivational rules included in the Moroccan English textbooks. In addition, the target construct is the receptive (passive/recognition) vocabulary size of these learners, and it will be measured by introducing only the base form, as is the case in the widely used receptive vocabulary size tests, such as the Vocabulary Size Test (VST) (Nation & Beglar, 2007) and the Yes/No test (Meara, 2010). In order to avoid confounding the attempt by tapping into the morphological knowledge assumed by word family count and lemma (Harrington, 2018), as Harrington maintains, the word family seems to be a valid unit of receptive vocabulary size that has widely been employed in vocabulary size research. In the current study, by receptive vocabulary size, we mean the number of word families whose basic meanings a learner is able to recognize in a written medium.

Receptive Vocabulary Size

Psychometric measurement of any construct demands a clear understanding of the construct being measured (Bachman, 1990). This way, one can assess the validity of the instrument to be used in tapping the construct under examination. For vocabulary construct, a much deeper insight into the vocabulary knowledge construct is needed rather than a detailed account of what constitutes a word (Meara, 1996).

One of the earliest attempts to define vocabulary as a multifaceted construct is Anderson and Freebody's (1981) distinction between breadth and depth of vocabulary knowledge. Breadth, or size, concerns the number of words a learner knows; depth refers to how well one knows about a single word. Studies in the field of vocabulary have mostly dealt with breadth (Qian & Lin, 2020), as it is easy to conceptualize and hence operationalize (Schmitt, 2010).

The bulk of words at the disposal of the learner can be either known receptively or productively. This means that some aspects of words are known receptively in that a learner is able to recognize them, but he or she is not able to produce them (Nation, 2013). Receptive vocabulary size is the number of words needed for reading or listening, while productive vocabulary size is essentially needed for writing and speaking (Nation, 2020). Research has shown that L2 learners' receptive vocabulary size is larger than their productive vocabulary size (Fan, 2000), and this explains why receptive vocabulary size has been conceived as the very basic aspect of vocabulary knowledge (Meara, 1996).

The importance of this basic dimension lies in its predictive role as far as performance on receptive skills (i.e., reading and listening) is concerned. For example, results from studies on lexical coverage revealed that knowledge of 3000 words is needed for lexical coverage of 95% of any authentic text (Laufer, 1992) if this portion is sufficient to understand the text, and knowledge of 6000–7000 words is needed if 98% of coverage is required to demonstrate a reasonable comprehension of any written text (Nation, 2006). For listening, a study by Zealand and Schmitt (2012) showed that understanding speech requires only 90% to 95% coverage, and hence, a learner

has to know 2000 to 3000 words to exhibit successful listening skill use. In short, these studies indicate that there is a strong relationship between receptive language skills and the number of words a learner masters. Yet, one has to be clear about the nature of the words that must be known to successfully perform basic language skills. The numerical thresholds suggested above pertain to the most frequent words in the English language.

Words in any language differ in form and meaning, as well as in how often they are used in daily life (Harrington, 2018). This indicates that learners mostly encounter them more often than, hence, less frequent words (Schmitt, 2010). To this end, frequency is, as stated above, a significant index of first- or second-language learners' vocabulary knowledge (Ellis, 2002). It follows from this that, as Harrington (2018) states, "the likelihood that a given word is known can be predicted to a large extent by the frequency with which it appears in the language" (p. 15), and therefore, he adds, "high-frequency words are learned before mid-frequency words, which in turn are acquired before low-frequency words" (p. 15). This means that when measuring the receptive vocabulary size of first language and second language learners, they are expected to produce a "typical [lexical] profile" (Meara, 1992, p. 5), in which the size of words mastered receptively is organized in a way that reflects the frequentist model illustrated in Figure 1. As shown in Figure 1, words with a high frequency of occurrence in the natural use of language take up a large space of overall vocabulary size. Then, knowledge of words tends to shrink as the frequency indicator descends (Harrington, 2018).

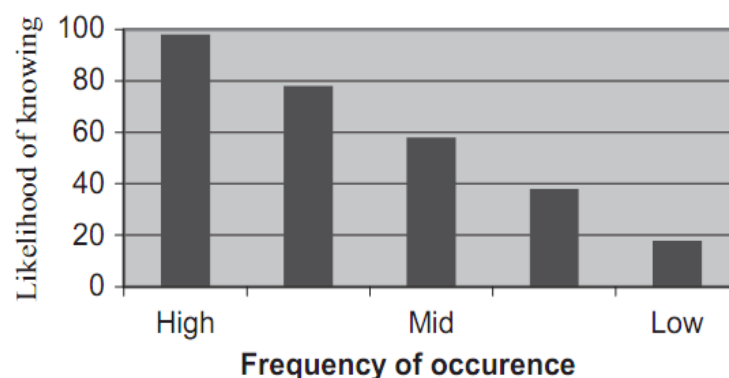


Figure 1. A frequency-based model of vocabulary size

Overall, Harrington (2018) summarized three major assumptions one has to consider with respect to defining RVS. The first has to do with the frequency-acquisition connection; the more frequently an item is used in language, the more likely a learner will acquire the item. Second, the receptive vocabulary size of learners is arranged in terms of frequency bands that decrease relatively from high-frequency to low-frequency bands. Practically, researchers tend to limit the number of words in each band to 1000 words. This has been conventionalized in that the first band refers to the first 1000 frequent words from the 1st rank to the 1000th rank, and the second band includes words from the 1001st rank and the 2000th, etc. Finally, given that L2 learners have different learning experiences, it is likely that they may acquire some low-frequency words that are related to their own learning experience (e.g., learners of English for specific purposes) or their interests. Such learners might "produce peculiar, unbalanced profiles" (Meara, 1992, p. 5) in which one or more of the frequency bands deviate from the descending patterns shown in Figure 1.

Based on these defining assumptions, researchers have developed a variety of receptive vocabulary size tests that reflect a frequency-based perspective on the construct. The most commonly used ones in the literature are the Vocabulary Levels Test (Schmitt et al., 2001), the Vocabulary Size

Test (Nation & Belgar, 2007), and the Yes/No test (Meara & Jones, 1990). These tests are all based on frequency as an index in order to measure the number of words one is able to connect their meanings to their forms, or vice versa. Yet, each test is unique in its methodological rationale for how a learner exhibits the form-meaning mapping ability. These tests have been employed by a large body of studies, adopting the frequency-based definition of the construct-receptive vocabulary size to tap into the receptive vocabulary size of both native speakers and second language learners.

2.2. The RVS of Native Speakers

Initial studies focused mainly on counting the number of words native speakers of English know. In a concise review of these studies, Nation and Waring (1997) reported that five-year-old children acquiring English as their first language know about 4000 to 5000 word families, and they approximately enhance their lexical competence by 1000 words per year. This rate suggests that a literate native speaker knows about 20,000 words. A recent empirical study by Coxhead et al. (2015) measured the vocabulary size of 243 students in New Zealand whose ages ranged between 13 and 18. Using the Vocabulary Size Test, they found that students aged 13 to 15 had a mean size of 6400 words, and students aged 16 to 18 had a command of 9400 words, with some exceptional students who were able to recognize about 17,000 words. For L2 learners, it seems difficult to attain such a level of lexical mastery (Schmitt, 2010). Nation and Waring (1997) noted that the gap between native speakers and L2 learners' vocabulary size is large, as adult L2 learners' knowledge sometimes might not exceed 5000 words.

For L2 learners, however, they do not have to attain a native-like mastery of vocabulary size (Schmitt, 2010). This means that since the learning settings and objectives of L1 and L2 learners are not the same, they might not show similar lexical profiles. L2 learners should, hence, focus on high-frequency vocabulary that would enable them to perform various language skills. Words of low frequency are a luxury at the disposal of the L2 learner, or sometimes they are related to specific disciplines, i.e., English for Specific Purposes, which might not be of value to all learners of the English language (Schmitt, 2010). As a result, L2 learners might exhibit, as stated above, a peculiar lexical profile (Meara, 1992).

2.3. The RVS of L2 Learners

L2 learners' vocabulary sizes have been measured in a wide range of studies across a variety of countries, and these studies have shown inconsistent receptive vocabulary sizes. A study conducted by Nurweni and Read (1999) measured the receptive vocabulary size of first-year Indonesian students using a translation test, a word associate test, and an interview. A total of 324 university students were tested on 800 academic words and on West's (1953) General Service List of 2000 frequent words. The findings showed that the learners mastered about 1226 words. Similarly, Kweldju (1997) tried to figure out how many words Indonesian students in the Department of English know receptively, and he found that on average, students knew around 2800 words.

Another study by Kurniawan (2017) demonstrated that Indonesian first-year English major students were able to recognize 1400 words. This was confirmed by a more recent estimation by Chinokul and Sudarman (2018) using the Vocabulary Levels Test to tap into the vocabulary size of a total of 33 students. The findings showed that this small sample had a vocabulary size of about 1273 words. Overall, the results of these studies revealed that Indonesian first-year students join the English department with a vocabulary size below the threshold suggested by researchers to perform effectively in general English language skills.

From a comparative point of view, López-Mezquita (2005) compared the receptive vocabulary size of Spanish university students and secondary school students (10th grade), and it was found that university students knew about 3174 English words while 10th grade students had a vocabulary size of 941 words. In the same vein, Cobb and Horst (1999) compared the receptive vocabulary size of two groups of Chinese university students: first-year and second-year students. Taking the Vocabulary Levels Test, both groups scored highly on bands 1 and 2, but second-year students outperformed in band 5. These studies indicate that the educational level and the amount of instruction students receive can lead to different lexical profiles.

As for vocation-oriented students, there is limited research on how many words they are able to recognize receptively. Teng (2015) conducted a study on 3105 Chinese vocational college students who generally studied English for three years. He found that on average, students knew about 2717 words, and this is a low vocabulary size compared to high-intermediate Chinese students in academic majors. Teng further analyzed their textbooks using Heatley et al.'s (2002) Range program, and he found that 1,287 out of 4,166 families occurred in the textbook from one to twenty times, suggesting that students had been continually exposed to an overall 1287 words that they would never encounter again or would encounter only a few insufficient times.

In Morocco, a few studies have focused on the receptive vocabulary size of learners of English. An initial attempt was made by Harraqui (2017), aiming at measuring vocabulary size among English major university students using Meara's Yes/No test. A total of 130 students took the test, and the results revealed that they were able to recognize around 4014 words. They also showed that learners' vocabulary size tends to deviate from the frequency-based pattern in the second band, in which students scored lower than in the third and fourth bands. Another unpublished study by Ait Hammou (2018) measuring the receptive vocabulary size of Moroccan secondary school students and its development in a one-school-year period showed that common core students started the year with knowledge of 793 words and ended with 982, but not all students had developed their lexical knowledge. As for baccalaureate students, they knew 1516 at the beginning of the year and reached 1789 at the end of the school year. Similar to Harraqui's (2017) results, secondary school students on both occasions performed lower in band 2 than in band 3, reflecting a violation of the typical profile suggested in the literature.

Overall, previous studies have tried to provide estimates of the receptive vocabulary size of L2 learners across various contexts and levels. The discrepancy in vocabulary sizes found in these studies can be accounted for by the status of English in the different contexts and by the various levels targeted in these studies. As Schmitt (2010) points out, different levels may show different vocabulary sizes. Thus, the education or training level and major of students can also be among the possible factors leading to disparities in the vocabulary sizes of second or foreign language learners.

Moreover, studies are abundant regarding the receptive vocabulary size of first and second language learners across different countries, while in Morocco, L2 vocabulary research is still in its infancy as a few studies have been published targeting the very basic aspect of vocabulary. In addition, previous studies generally show a bias towards some categories of L2 learners (e.g., English major university students, secondary school students), while there is a dearth of studies focusing on learners at vocational schools and how their training level and the amount of instruction they have had in English are related to their receptive vocabulary knowledge. The present study, hence, seeks to address these issues as regards a rarely investigated category of learners of English in Morocco, i.e., specialized technician (ST) trainees at ISTA.

3. Research Questions

The current study addresses the following research questions:

- a) How many words do Moroccan EFL learners at ISTA know receptively?
- b) Is there any relationship between their receptive vocabulary size and their training level?
- c) Is there any relationship between their receptive vocabulary size and the years of instruction they have had in English?

4. Methods

4.1. Participants

In the OFPPT training system, there are three training diplomas; these are *qualification* diplomas, *technician diplomas*, and *specialized technician (ST)* diplomas. Participants involved in this study are secondary school graduates taking their training to obtain their ST diploma (1st year and 2nd year), as only high school degree holders can join this training program. This means that only trainees at this level have at least three years of experience learning English. To get this diploma, trainees have to complete two years of vocational training. In this program, 60 hours are devoted to English, 30 hours per year. As pointed out before, no textbook has been designed for this 60-hour course. Since students have to sit for a final exam, the content presented at ISTA depends mainly on the exam-oriented guidelines given to instructors and their teaching experience.

Data were collected from ST trainees at various ISTAs in Morocco, representing five Moroccan regions. They were selected using cluster sampling; intact groups of trainees from ISTAs in different cities were randomly selected, except for two cities as they were convenient for the researcher (Rabat and Tan-Tan). A total of 405 trainees from Rabat ($n = 109$), Agadir ($n = 68$), Khenifra ($n = 101$), Dakhla ($n = 61$), and Tan-Tan ($n = 66$) took the test. The two levels, ST1 level ($n = 207$) and ST2 level ($n = 198$), belong to two training departments: business management and commerce. As per gender distribution, 158 were male (41.9%) and 219 were female trainees (58.1%). Finally, the number of years of learning English in a formal setting for the trainees ranged from 3 to 10 years.

4.2. Data Collection

The Yes/No test

The present study used Meara's (2010) updated version of the Yes/No test to collect data for the present study. Meara designed the test mainly for learners of English as a second language. Generally, the test is made up of a set of checklists, which are sequenced in terms of six levels of frequency. Levels 1 and 2 are the basic ones in that they include items from the 2000 core English words in Nation's (1983) Vocabulary lists: words, affixes, and stems. Levels 3, 4, and 5 are items from Hindmarsh's (1980) list, which is a revision of West's General Service List (1953). The final level, termed the A level, is also based on Nation's work and measures knowledge of academic words. In the present study, the measurement was limited to the fifth level; that is, the measurement of level A was excluded in this estimation, as vocational learners might not be concerned with this type of vocabulary.

Each level contains 60 discrete items, 40 real words, and 20 imaginary words (i.e., pseudowords). Each real word represents 25 words in the band (i.e., 1000 words); hence, 40 words in each level represent the entire band. The 20 imaginary words inserted in each level are important to control for guessing since the test is based mainly on examinees' self-reported knowledge, and they adhere to

the phonotactic constraints in order to sound like real English words. Meara (2010) states that “these items enable us to make an educated guess about how much guessing an examinee is making” (p. 10). One can distinguish between examinees who are less reliable from reliable ones by looking at the number of imaginary words that are claimed to be known.

In the administration of the test, test-takers were asked to mark the word with a yes if they knew it. If they do not know the word, or if they are not sure, they were asked to mark the word with a no. Participants were also asked not to spend much time thinking about the words because it might increase the chances of making blind guesses. The test yields four types of responses: yes to real words (hits), no to pseudowords (correct rejections), no to real words (misses), and yes to pseudowords (false alarms).

The psychometric properties of the test

The Yes/No test “directly taps knowledge of the target items in a way that is not affected by the cues used in possible response alternatives” (Harrington, 2018, p. 39). This makes it a highly reliable test. Mochida and Harrington (2006) compared scores on the Vocabulary Levels Test and the Yes/No test and found that the two formats showed approximately similar results. Yet, the examinees completed the VLT in 30 minutes, whereas the Yes/No test was completed in less than five minutes. In the Yes/No test, the examinees take a few seconds to recognize each item. This allows for the measurement of a relatively large number of items in a short time. This suggests that although it is straightforward in terms of administration (and scoring), the test exhibits high practicality and yields consistent scores.

It should be noted, however, that the instruction in the Yes/No format raises an issue as far as the validity of the test is concerned. The statement in the test instruction ‘if you know what it means...’ can be conceptualized in different ways by the examinees. ‘Knowing a word’ can mean a different thing to each learner. A learner might claim knowledge of some items just because she or he has seen the form before without knowing what it means, while another learner might claim mastery of a word only if she or he can use it. In short, although the test measures the receptive vocabulary size, without specifying how well one knows about the item, i.e., depth of knowledge, one should make it clear to the examinee that they only have to mark the words for which they know their meanings as known words. In the administration of the test, examinees were reminded verbally that they have to mark words if they know their meaning with *yes*, and if they are not sure, they write *no*.

Scoring

Concerning the scoring process, the [Hits - False Alarms] formula was used to score the responses to get the overall number of words Moroccan EFL learners at ISTA know. For each level, the number of false alarms (FA) was subtracted from the proportion of hits. 10 FA was set as the maximum number of such responses examinees are allowed to make; responses are not reliable if this threshold is exceeded, and hence they are eliminated. 21 of the responses were excluded from the study for this reason.

However, the [Hits - False Alarms] formula does not incorporate correct rejections, which may account for blind guessing. After subtracting false alarms from hits, we got the number of words the test-taker was able to recognize in the list. Since every word in the list represents 25 words at the same level, we multiplied each score in each test by 25 in order to get the number of words participants know receptively per band. Finally, the words known by each individual in the five bands were tallied to get the overall receptive vocabulary size. The scores were coded into data analysis software (SPSS) in order to obtain background information frequencies, a numerical

description of trainees' vocabulary size, and inferential analysis. These are presented in the next section.

5. Results

5.1. The RVS of Vocational Trainees

Table 1 presents a description of the data collected from two groups (TS1 and TS2) at different ISTAs in Morocco. As can be seen, ISTA trainees were able to recognize a mean of 1916.46 (SD = 852.85) in the 5000-word test. The table also shows the distribution of this overall size across both TS levels. The mean size of the receptive vocabulary of TS1 trainees was 1822.84 words. The total vocabulary size of this group had a standard deviation of 834.43, which indicates a relatively high dispersion among ISTA trainees. In addition, this variation in the vocabulary size is also indicated by the large range observed in the wide distance between the minimum (300 words) and the maximum (4525 words), much as might be expected of these trainees who have had an unequal number of years of formal exposure to English.

Table 1. Descriptive Statistics of the receptive vocabulary size of Moroccan EFL learners at ISTA.

Level	N	Max	Min	Mean	SD
Total	377	300.00	4525.00	1916.46	852.85
ST1	197	300.00	4525.00	1822.84	834.43
ST2	180	450.00	4525.00	2018.11	863.28

Concerning TS2 trainees, the mean size of their receptive vocabulary knowledge was 2,018.11. Compared to TS1 trainees, the TS2 group scored slightly higher (difference = 195.27). The standard deviation was 863.28, showing, again, a lot of variation among trainees at this level. The minimum score for TS2 trainees was 450 words, producing a difference of 150 words compared to TS1 trainees' minimum score. Both groups had the same maximum score, which was 4525 words. Two trainees showed this remarkable result. Both of them reported that they had private classes in English, learned English using the Internet, watched English movies, and, more importantly, studied English for a period of 8 years.

The boxplot in Figure 2 depicts the two extreme cases that had the maximum vocabulary size as outliers, in addition to a third case that had a mean vocabulary size of 4425 words. Thus, the actual (excluding the outliers) maximum score was 3950 and 4250 words for TS1 and TS2 trainees, respectively. Moreover, the figure shows that TS2 trainees had a median higher than that of TS1 trainees, indicating that second-year trainees performed slightly better than first-year trainees in the Yes/No test.

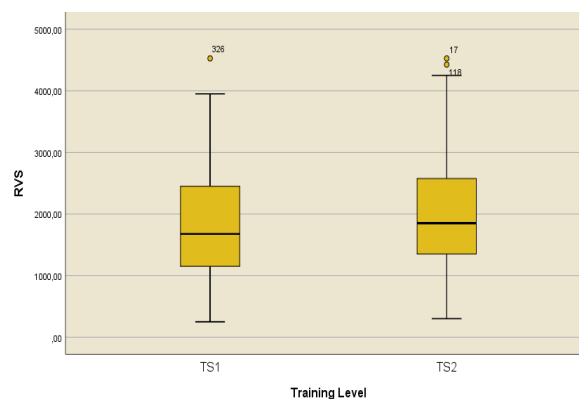


Figure 2. The boxplot distribution of the scores of the TS1 and TS2 groups

5.2. RVS and the Frequency Bands

Table 2 shows the distribution of the overall vocabulary size of the two groups across the five frequency bands. As can be seen, the highest performance of TS1 trainees was in band 1, which incorporates the most frequent 1000 words in English ($M = 496.42$, $SD = 198.72$). The maximum number of words known was 925.00 and was obtained by two respondents. The vocabulary knowledge of the two cases covered approximately 92.5% of Band 1. In band 2, the mean size of vocabulary knowledge decreased to 363.00 words ($SD = 191.03$), meaning that trainees were able to recognize the meanings of only 36% of the 1000 words in band 2. In this band, a wide range can be observed between the maximum vocabulary size (900.00) and the minimum (25.00).

Table 2. Descriptive Statistics: mean size for vocabulary knowledge at the five bands.

Level/bands		N	Min	Max	Mean	SD
TS1	Band 1	196	100.00	925.00	496.42	198.72
	Band 2	196	25.00	900.00	363.39	191.03
	Band 3	196	25.00	850.00	401.02	177.20
	Band 4	196	25.00	875.00	335.20	191.17
	Band 5	196	25.00	675.00	213.01	148.00
TS2	Band 1	178	25.00	925.00	522.86	205.75
	Band 2	178	25.00	925.00	389.03	180.15
	Band 3	178	25.00	950.00	440.30	181.68
	Band 4	178	25.00	900.00	396.99	206.59
	Band 5	178	25.00	675.00	242.13	156.27

In band 3, however, the mean vocabulary size was higher than that of band 2 ($M_{3k\text{-band}} = 401$, $SD_{3k\text{-band}} = 177.20$), suggesting that TS1 trainees' vocabulary knowledge covered around 40.1% of band 3. In the remaining bands, TS1 trainees knew 335 words in band 4 ($SD = 191.17$) and only 213 words in band 5 ($SD = 148$). Items in band 5 seem to be difficult for the learners since they represent words with relatively low frequency. The standard deviations in the five bands showed a lot of variation in the receptive vocabulary size of the respondents. Concerning the TS2 group, their mean size of vocabulary was 522.86 in band 1, with a standard deviation of 205.75. The maximum number of known words was 925, and only 1 trainee could recognize the meanings of approximately 92.5% of band 1. As for band 2, trainees knew on average 389 words ($SD = 180$). Again, the maximum score was 925 and was obtained by the same trainee. Actually, this trainee had the highest scores across all five bands. The trainee reported that she or he studied English for nine years; she or he had access to digital materials to learn English and watched English movies. Unfortunately, I could not contact her or him for further qualitative information that would account for this high coverage of the two bands, as the participants were required to fill in the test anonymously.

At the third level, the trainees' mean size of vocabulary was 440.3 ($SD = 181.68$). The trainees' knowledge covered 44% of band 3 in English. For band 4, trainees were able to recognize 396 words, that is, 39.6% of the words at this level. Finally, in band 5, participants knew only 242 words, with a very large spread of data ($SD = 156$) compared to the obtained mean size of vocabulary knowledge. The maximum number of known words in this band was 675. As for the minimum, 25 words were known at all levels. The wide distance between the maximum and the minimum and the high standard of deviation across all the bands indicate, again, a wide range and a lot of variations in the dispersion of the data. Generally, the results reveal that the development of the receptive vocabulary size of both groups, TS1 and TS2, exhibited an incrementally decreasing lexical profile, except in

band 3 in which learners scored higher than in band 2. This is best captured in the frequency-based vocabulary size development polygon shown in Figure 3.

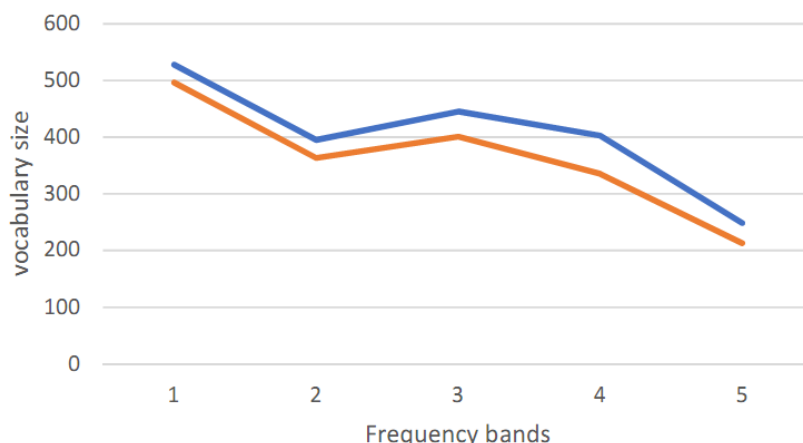


Figure 3. The receptive vocabulary size development of TS1 and TS2 across the five bands.

Figure 3 presents the comparison between the means of RVS of the two groups across the five frequency bands; the two decreasing lines represent the mean vocabulary size distribution of TS trainees over the five frequency bands. As it is demonstrated, both groups displayed more or less the same pattern of decrease. Surprisingly, the vocabulary size of both groups dramatically declines from band 1 to band 2, and it tends to increase from band 2 to band 3. Then, they gently slope, starting from band 4. It follows from these results that the vocabulary knowledge of the trainees reflects the pattern of vocabulary development suggested by the frequency-based model of vocabulary knowledge, with an exceptional deviation in bands and 3.

5.3. RVS and the training level

The administration of the test took place two months after the school year had started. The mean vocabulary size of TS1 trainees was 1822 (SD = 834.43), while TS2 on average knew 2018 words (SD = 863.28), showing a difference of 196 words. This difference seems to be very low, but a t-test was run to examine its significance. As shown in Table 3, Levene’s test showed that the two groups had equal variances: $F(375) = .10, p = .748$. The independent-samples t-test indicated that the difference between TS1 and TS2 was statistically significant in favor of TS2, $t(375) = -2.242, p = .026, d = 0.02, 95\% \text{ CI } [-368.09, 09, -24.10]$. This means that TS2 trainees significantly outperformed TS1 trainees, indicating the level of training affects the receptive vocabulary size, but Cohen’s d ($d < .02$) indicated a small effect size, and the 95% CI $[-368.09, -24.10]$ is close to zero (note that one word in the test represents 25 items).

Table 3. Independent t-test of difference between TS1 and TS2 scores.

Levene’s Test		t-test for Equality of Means				
F	Sig.	t	Df	Sig. (2-tailed)	95% CI	
				Lower Upper		
.10	.748	-2.242	375	.026	-368.09	-24.10

5.4. Years of Instruction and RVS

Table 4 shows the numerical summaries of the number of years of instruction in English for both groups, TS1 and TS2, combined. As shown in Table 4, the mean number of years spent studying English was five, with a standard deviation of 1.49. The maximum number of years was 10, and the minimum was three. This indicates that the majority of respondents studied

English only at ISTAs and at high school (one to two years at ISTA + three to four years in secondary school). It is not clear, however, that these learners had had a continuous four- or five-year period of formal instruction in English.

Table 4. Descriptive statistics of overall number of years of learning English in formal settings.

	N	Max	Min	Mean	Sd
Years of instruction	377	3.00	10.00	5.09	1.49

Figure 4 shows the scattering of years of instruction compared to scores on the receptive vocabulary size test. The inspection of the scatterplot depicts a relationship between the two variables. The line sloping upwards through the data indicates that the nature of the relationship between the number of years of learning English and the number of words ISTA trainees know is linear. This linearity of this relationship allows us to further analyze the correlation between the number of years of instruction and the number of words known across the 1k–4k bands, as the performance of learners in band 5 was not significant.

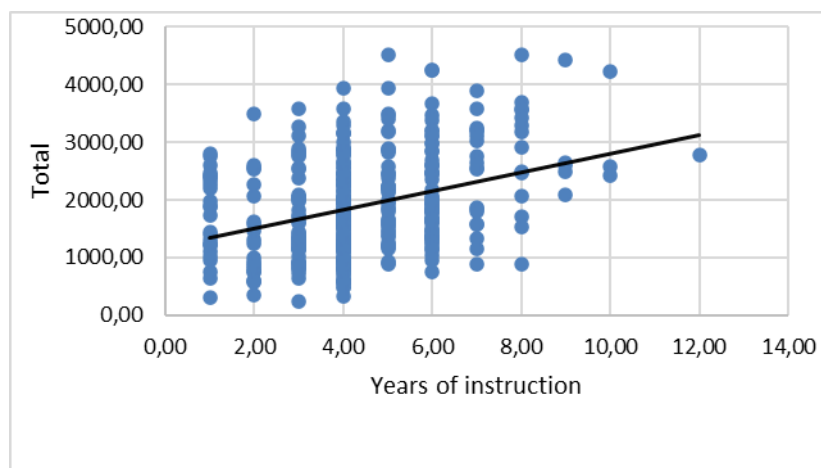


Figure 4. The scatterplot for the relationship between years of instruction and the total vocabulary size.

Table 5 presents the Pearson correlation coefficient for the relationship between the years of instruction and the receptive vocabulary size of the trainees at ISTA: $r(377) = .572$, $p = .000$, $r^2 = .32$. The analysis showed that years of instruction and RVS of ISTA trainees fairly correlate, as 32% of the variance was shared by the two variables, and the correlation was statistically significant at $p < .001$.

Table 5. The correlation coefficient of the relationship between the overall number of years of instruction and trainees' vocabulary size.

		Total Vocabulary size
Years of instruction	Pearson Correlation	.572**
	Sig. (2-tailed)	.000
N		377

6. Discussion

6.1. Question1. How many words do trainees at ISTA know receptively?

The main question the present study seeks to answer pertains to the number of words Moroccan EFL learners at ISTA know. The receptive vocabulary size of first-year ISTA trainees was 1916 words. The descriptive statistics presented above showed that first-year trainees knew on average 1822 words in the five bands. This result seems in line with that of the unpublished study by Ait Hammou (2018), who found that at the end of the school year, Moroccan baccalaureate students had an average of 1789 words. Noting that the test of vocabulary size took place two months after the school year had started (15th December 2018), the vocabulary size of first-year trainees at ISTA showed a difference of 33 words compared to the vocabulary size of secondary school graduates, which does not appear to be a significant difference. This means that even after two months of learning English, trainees could not improve their vocabulary size at the beginning of the vocational program.

As for the receptive vocabulary size of second-year trainees, the results presented above revealed that they knew an average of 2018 words. This vocabulary size is slightly lower than the vocabulary size of trainees at Chinese vocational colleges reported by Teng (2015), who found that Chinese trainees had a vocabulary size of 2717 words. Yet, it does make sense to weigh the significance of Moroccan trainees' receptive vocabulary size on a comparative basis with Chinese vocational trainees or students from other countries. The reason is that, as Teng reported, unlike Moroccan trainees, Chinese vocational trainees had three years of vocational training, with English being an essential subject in the vocational schools. Besides, we do not really know the status of English in the Chinese educational system or the main objectives of vocational colleges compared to those suggested in the strategic vision 2015–30 suggested by the higher council in Morocco.

For the significance results obtained to be meaningful, they can only be interpreted in light of the lexical thresholds required to effectively perform some language skills. One of the objectives set in the strategic vision 2015–30 is to introduce English as a medium of instruction to teach vocational content in some modules. Thus, at this level, the minimum language skills required for learners are to be able to understand words in conversations, particularly trainer-trainee classroom dialogues, and to demonstrate comprehension of academic and vocational reading texts. In this respect, trainees' ISTA performance in the first two bands was very low (mean-TS1 = 859; mean-TS2 = 911), showing that their lexical repertoire does not fit the threshold suggested in the literature on vocabulary size to successfully communicate using basic English (e.g., Nation, 2001; Laufer, 1992).

It is important to note that the estimation was limited to five bands. It is possible that ISTA trainees knew mid-frequency and low-frequency words (i.e., technical vocabulary), especially since these trainees had been introduced to French for vocational purposes, and a number of such technical vocabulary words are shared among various languages. Thus, it is by no means claimed that the estimations suggested in the present study reflect the overall vocabulary size of these trainees; instead, what is believed is that they represent the number of words Moroccan EFL learners knew across the five bands, which are necessary to perform on some language skills, and whose distribution lends support to both theoretical and evidence-based research with regard to the frequency-based model of second language vocabulary acquisition.

Theoretically, the findings confirm the three assumptions of frequency-based model size summarized by Harrington (2018). First, the proportion of frequent words that were known by ISTA trainees was higher than words with a low frequency of occurrence. Second, the overall number of words trainees knew was distributed over the five bands. That is, for each band, learners were able to recognize a set of words, reflecting the point that the vocabulary knowledge of L2 learners is organized in terms of

bands that decrease from high to low frequency. Third, the most striking result to emerge from our results is the relationship between vocabulary size and the L2 learning experience, as learners sometimes might produce lexical profiles that deviate from the descending pattern suggested by the frequency-based model. Clearly, our results revealed that knowledge of band 2 peculiarly demonstrated such a deviation from the frequency-based model of vocabulary development.

For the third assumption, empirically, the results substantiate findings from previous studies in the Moroccan context. Harraqi (2017) and Ait Hammou (2018) found that the lexical profiles of Moroccan EFL learners at the university and secondary school (respectively) exhibited a similar descending pattern of the vocabulary size organization, in which knowledge of band 2 tends to deviate from the frequency-based profile. The results point to the likelihood that the band 2 issue applies to all Moroccan EFL learners, and hence it can only be attributed to a shared source(s) of input. One thing for sure that these Moroccan learners had in common during their learning experience was exposure to the same textbooks adopted in the Moroccan curriculum for the English language course at secondary school levels. Therefore, the shared pattern of vocabulary development might be attributed to the way vocabulary items were selected, graded, and presented in the Moroccan English textbooks.

Knowing that the General Service List (GSL), which includes words in band 1 and 2, has long been the main resource for textbook designers to select the lexical items to be taught, it is likely that the majority of words selected belong to only band 1, thinking that they represent the two frequency bands. In other words, the GSL has been dealt with as one set instead of splitting it into two frequency bands, and then words from each band are selected in equal proportion. On that account, It is proposed that further research should be undertaken on the relationship between frequency of words and the Moroccan English textbooks and examine how such textbooks reflect the criterion of frequency in item selection.

6.2. Question 2. is there any relationship between the training level and RVS of trainees at ISTA?

Since our findings included data from learners with varied years of instruction, the results of the t-test analysis should be treated with considerable caution. This means that the significance of the difference ($D = 196$) between the vocabulary knowledge of the two groups might not result from the two months of instruction, especially since while we were administering the test, we noticed that most (if not all) of the lessons that were introduced in the session of test administration were structure-based. Of course, one cannot be sure that the content of the entire English module is centered around grammar based on one session unless a large-scale qualitative study (e.g., observation) is conducted.

However, with the absence of a textbook that might systematize the teaching of vocabulary, the hypothesis that the English language course is structure-based may not be rejected because, without such resources with systematically selected and sequenced vocabulary items, teachers would find it difficult to choose lexical items to teach, especially in a program where the objectives of teaching English are ambiguous: whether to recycle general English or teach English for specific purposes (i.e., English for vocational purposes). As a result, teachers might tend to restrictively introduce grammatical items. Therefore, a potential grammar-based 30-hour course that creates the difference between the two training levels does not seem to result in a significant difference between first-year and second-year trainees at ISTA in vocabulary size. Instead, the small difference observed between the two groups might be attributed to the distribution of trainees with dissimilar overall numbers of years of instruction across the two training levels. This is to be examined in answering the last research question.

References should be cited in the text by numbers in square brackets. Please do not use individual sets of square brackets for citation numbers that appear together, e.g., use [1, 4] or [1-3, 5], not [1],[2],[3], or [4]-[6]. All references cited in the manuscript must appear in the list of references at the end, while all references listed in the reference list must be cited in the manuscript.

6.3. Question 3. Is there any relationship between the number of years of instruction in English and the RVS of trainees at ISTA?

Results from the analysis of the association between trainees' reported number of years of instruction they received in English and their total vocabulary size indicated that there is a fairly strong positive relationship. This positive relationship between the two variables seems to come from the nature of the succession of the years of instruction with each period. In other words, it is likely that learners with a number of years of instruction higher than 6 had a continuous 6-year period of learning English; they had continuously been studying English in a formal context for 6 years or more. In contrast, learners who had less than this number of years of instruction might have had a gap year(s), which could not lead their lexical repertoire to progressively benefit from the formal instruction. This means that vocabulary knowledge development is indeed strongly associated with the amount of instruction, as long as the learner has a steady period of learning.

7. Limitations and Suggestions for Future Research

This study seems to be limited in two ways, and these limitations are mainly related to the administration of the Yes/No test. The first is that only one checklist per level was introduced to measure the number of words known in each band. More consistent estimations would be obtained if more than one checklist were used per band. As Meara (2010) points out, "you will get more reliable data if the testee fills in two or more tests at each level of difficulty" (p. 13). Despite this, the estimations the present study presents seem to approximate the actual average of the number of words Moroccan EFL learners know since we relied on a satisfactory sample size. The second is the period of administration of the test. It took us around 20 days to introduce the test in different Moroccan cities because the cities where the test administration took place were distant from each other.

The present study may not offer a complete picture of the issue, but it opens new scopes for further study and research. Our results seem to be promising, but they need to be validated by a larger sample. In addition, future works should concentrate on estimating the vocabulary size of other populations in the Moroccan context. This will pave the way for further advanced research on vocabulary teaching and learning. Studies also need to focus on investigating vocabulary in Moroccan English textbooks in terms of frequency items and their usefulness. It might help get insight into Moroccan EFL learners' lexical profiles and how they are related to the various sources of input they are exposed to, i.e., textbooks.

8. Pedagogical Implications

It is hoped that the study's estimation will aid English teachers at vocational schools in selecting and sequencing vocabulary items using the frequency criterion and taking into account this issue of variability in years of instruction. As a suggestion, it would be beneficial if teachers perceived their classrooms as containing two categories: trainees who have less than six years of learning and need recycling of previous knowledge of vocabulary (especially 1K through 3K bands) and trainees with more than six years of learning who need new challenging English materials so that they can keep their interest and boost their motivation to improve their English lexical repertoire.

Furthermore, the results of the study might be of interest to textbook designers. The first thing that comes to mind when mentioning an English course at vocational schools is English for Specific Purposes (i.e., English for Vocational Purposes). Normally, vocabulary items introduced in such courses should be selected from technical English rather than general English. However, as our findings suggest, the vocabulary knowledge of ISTA trainees in the 2000–3000 frequent English words, which are necessary to perform basic language skills, is very low. Thus, for textbook designers to proceed with developing an English textbook to be used at the vocational schools, taking into account this issue of general and specialized English, it would be useful if they began first with conducting a qualitative analysis of the needs of ISTA trainees. Then, they base their selection and sequencing of lexical items on both the findings of the needs analysis and the quantitative description provided by this study.

Finally, the results may provide policymakers with a picture of the status of English teaching at ISTAs. Accordingly, our estimation could be used to evaluate the extent to which the objective stated in the strategic vision 2015–2030, which concerns the empowerment of the English language at vocational colleges, has been achieved after four years of the implementation of this vision.

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