WORD KNOWLEDGE AND VOCABULARY INSTRUCTION

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Abstract*—*This paper first considers some of the practical and theoretical issues involved when teaching or learning vocabulary items in an ESP course, and discusses (briefly) the notion of what it means to know a word. Following that, it reports on the results of an experiment designed to test the usefulness of a slightly modified version of the Vocabulary Knowledge Scale developed by Paribakht and Wesche and how this has given us insights into our students' knowledge of certain vocabulary items and their learning processes. Finally, it suggests a number of factors to bear in mind when teaching vocabulary. Although the L1 of the subjects involved in this research was Spanish and the target language English, we believe the general findings reported in this paper are applicable to speakers of other L1s learning other languages.

Index Terms—ESP/LSP, second language learning, vocabulary acquisition, vocabulary knowledge.

INTRODUCTION

One of the main concerns for those of us working in an ESP context, is how to help our students deal with (i.e. understand, extract information, assimilate, evaluate, summarise) authentic academic texts which, by their nature, require a fairly advanced level of proficiency in order to be understood. By 'advanced level of proficiency' we mean, in effect, a good vocabulary size, because although it's possible to find examples in texts (especially scientific or technical texts) where grammatical structure is crucial to understanding the subtle nuances of meaning, it could be argued that what is more important for comprehension is knowing what the words mean [4, 10]. As Vermeer [33: 147] puts it: "Knowing words is the key to understanding and being understood".

There are several approaches one could adopt in order to develop students' vocabulary; Coady [5] for example, identifies four main positions on what he calls the vocabulary instruction continuum. Without going into the pros and cons of different methods, and bearing in mind our opening comment that the underlying aim is to develop students' text comprehension in an academic environment, it seems clear that L2 learners in ESP contexts need some explicit teaching of specific vocabulary items together with some kind of strategy training for improving and managing their learning, plus extensive reading – usually outside the class – in order to gain the required exposure to lexis and build up word knowledge. There are problems, however.

SOME PRACTICAL AND THEORETICAL DIFFICULTIES

Outside the classroom our students (and they are probably typical) do not engage in extensive reading. It's very unlikely, in fact, they will do any reading at all: one reason is a self-perceived lack of proficiency in reading which results in feelings of frustration, demotivation and a strong desire to avoid the effort involved. Another is that they have very little time free for extra reading. In any case, reading a word once is not usually enough for a learner to retain it. Estimations in the literature of how many times we need to see a new word before we learn it range from 5-17, averaging out at around 10 [cf. 28], so extensive reading is unlikely to result in large increases in vocabulary knowledge unless students read the enormous amount necessary for new words to be repeated in context a sufficient number of times for them to be noticed and acquired.

Time is also a factor within the classroom. Our engineering students, for example can only look forward to (!) a total of 60 hours of English or other L2 during the whole academic year. As Sinclair and Renouf [31: 143] point out, "it is exceptionally difficult to teach an organized syllabus of both grammar and lexis at the same time". And we do need to teach them grammar, for although it would make our task easier if we could assume our students come from the same language learning background, unfortunately there are huge differences in the linguistic (and world) knowledge they bring to the L2 class. Not all of them have a complete grasp of the more complex syntactic structures (such as conditionals, passives, embedding), precisely the range of structures which are more common in academic texts.

Then there is the size of the class and a range of factors which affect students' attendance. Both large classes and irregular attendance make it extremely difficult to monitor a particular student's development or provide adequate individual feedback.

There are other difficulties when we do decide to give time to specific vocabulary in class. To the question: how many lexical items should be taught in a lesson, Gairns

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and Redman [7], for example, suggest 8-12 items. But, as Laufer [16] points out, this figure does not take into account the level of difficulty of the target item. Laufer discusses several examples of what she calls 'intralexical factors' of a word which may either facilitate or make more difficult a word's learnability. These intralexical factors refer to a set of properties such as the word's pronunciation (or rather its pronounceability), its orthography, the degree of correspondence between how the word is written and how it is said (i.e. script and sound). A new word in English may offer no clues to its pronunciation or, perhaps worse, misleading clues (compare, for example, *crow* and *cow*; *thrown* and *down*; but then *crown*). Other intralexical factors include: word length, number of syllables, morphology, part of speech and semantic features such as abstractness, appropriateness, idiomaticity, multiple meanings.

The latter are a particulary rich area for confusion. What, to offer one example, is the meaning of 'precipitation' in the following remark?

> There was too much precipitation
> for the experiment to be a success.

Many learners fix on one meaning they know and find it very difficult to use another – even if the one they know has no sense in that new context.

Other factors affecting learnability may involve the target word's relationships to other words ('interlexical factors') and crosslinguistic influences or transfer from the learner's L1. To give an example of the first of these, there could be dangers in teaching associated words, such as synonyms or opposites, at the same time. Teaching 'right' and 'left' together could result in students confusing form and meaning and being unsure afterwards whether *left* means 'left' or whether it means 'right'. A similar confusion can occur with words that share a number of semantic features [12, 19]; for example, *rigid*, *stiff*, *unbending*, *inflexible*, *stubborn*; or *under*, *below*, *lower*, or *axle* and *shaft*. Students may end up not being clear about what the differences between them are.

A quite important contributor to difficulty is what Laufer [14] termed 'synformy'. This is the visual or acoustic similarity of lexical forms which may cause learners to confuse similar words. We will return to some of these points later with examples, but first we'd like to move on to the question of what it means to know a word.

WORD KNOWLEDGE

Beck and McKeown [2], amongst others, argue that before we can talk about vocabulary instruction we need to be clear about what it means to know a word. They suggest that knowing a word is not an absolute – it is *not* the case that you either know it or you don't – but a continuum ranging from not knowing to "rich decontextualised knowledge of a word's meaning, its relations to other words and its extension to metaphorical uses" [2: 792].

Nation and Waring [20] propose a three-dimensional model to describe a person's vocabulary knowledge depending on:

- the number of words known
- the amount of knowledge present for each word (depth of knowledge)
- how quickly the word can be utilised (automaticity)

Knowing a word, therefore, involves knowing (or being more or less 'familiar with') a set of features which in fact is very similar to the list of factors involved in the learnability of a word we discussed above:

- pronunciation
- spelling
- grammatical patterns
- meaning(s) – in different contexts
- appropriateness – in different contexts
- relations with other words – typical associations, frequent collocations
- derivations

These features, then, refer to our 'depth of knowledge' of a word which may range from superficial to deep [25] at different stages of learning. The higher the degree of familiarity, the closer this knowledge comes to being productive [18]. This brings us to the third main issue in this paper, which is the Vocabulary Knowledge Scale.

DEPTH OF KNOWLEDGE AND THE VOCABULARY KNOWLEDGE SCALE

The Vocabulary Knowledge Scale (VKS) was originally developed by Paribakht and Wesche [22, 23], to "distinguish stages in learners' developing knowledge of particular words" [23: 179].

Subjects are presented with a target word in written form and required to indicate their self-perceived knowledge of the item in question by completing one or more of five self-report categories. These range from total unfamiliarity with the word, to knowledge of how to use it in grammatically and semantically correct ways in a sentence. If the subject either *thinks* or is *sure* s/he knows the meaning of the word s/he is required to demonstrate this knowledge by providing a translation or a synonym, (although, as we have seen, knowing a word involves more than just this), or by providing an appropriate sentence. The self-report categories are shown below in Table I.

TABLE I
VKS ELICITATION SCALE: FROM PARIBAKHT AND WESCHE [23: 180]

Self-report categories
I I don't remember having seen this word before.
II I have seen this word before but I don't know what it means.
III I have seen this word before, and I <u>think</u> it means _____ . (synonym or translation)
IV I <u>know</u> this word. It means _____ . (synonym or translation)
V I can use this word in a sentence: _____ . (Write a sentence.) *(If you do this section, please also do Section IV.)*

Paribakht and Wesche point out [23: 179] that, as it stands, the VKS (Vocabulary Knowledge Scale) is not designed to show additional word meanings, derivations or associations – although they do seem to have used responses to it to support their claim that their learners achieved both quantitative (more words known) and qualitative (greater depth in their knowledge of target items) gains in vocabulary [23: 189]. In our modified version we simply added two more categories to the original five, resulting in the format shown in Table II.

TABLE II
THE MODIFIED VERSION OF THE VKS USED IN THE STUDY SHOWING THE FIRST OF THE TARGET ITEMS

<u>Target word</u> *according to*	**I** I don't remember having seen this word before	**II** I have seen this word before but I don't know what it means	**III** I have seen this word before and I <u>think</u> it means (synonym or translation)
IV I <u>know</u> this word. It means (synonym or translation)		**V** I can use this word in a sentence (write a sentence)	
VI I know some derivatives of this word		**VII** I can use these words in sentences (write sentences)	

PRESENTATION OF THE VKS TO THE SUBJECTS

Subjects were 22 young adult students in their first year of a three-year course in Agricultural Engineering. All were native speakers of Spanish (Castilian) with about half also having native-like proficiency in Valencian (the regional language).

To avoid any misunderstandings regarding task requirements the presentation of the material and the instructions were given in Spanish. Using an overhead projector students were first shown a specimen form and the meaning of each category was elicited. The target word 'undergo' was given and the group of students asked which category they would mark. 'Undergo' was chosen for several interrelated reasons:

i) it appears in the text the students would be required to read later in class

ii) it would be a way of pre-teaching its meaning, as

iii) it was assumed that most students would not know the word

iv) it would help emphasise that there would be items students would be unfamiliar with and that it was perfectly acceptable to indicate this; in other words, to help make clear that the activity was not a test of any sort and to encourage students to answer truthfully.

Regarding this last point, although Categories III-VII require some demonstration of word knowledge, we were also interested in the students' recognition of certain words to which they had been exposed in previous texts.

The next step was to give a second target word ('farm'), and again, several reasons influenced our choice:

i) it was assumed that all students would know the word and be able to give its meaning either as a verb or as a noun and thus encourage them to give multiple meanings of a word if this arose

ii) it was assumed that all students would know derivatives such as *farmer*, *farming*, *farmed*, *farmland* and be able to use these in sentences.

The categories for 'farm' were completed as a group, and once we were satisfied that students understood the task requirements they were given the forms to complete. No time limit was set and all the target items were seen in isolation; that is, with no contextual clues.

PARTIAL KNOWLEDGE

What does our modified VKS tell us about our students' vocabulary learning? Table III shows some of the sentences produced by the students to demonstrate their word knowledge.

TABLE III
STUDENT SENTENCES

Target word	*V I can use this word in a sentence (write a sentence)*
breeding	1) I am breeding some birds
	2) I am breeding the pigs their dinner – 'bread' given as a derivation
sources	3) The people of the Third World haven't sources
	4) There are a lot of sauces in this park
secure	5) I am secure that you don't have any money
following	6) I am going to following planting this variety
according to	7) Accordint to this text this is true
	8) Accordind to the UCLA …
develop	9) The plants have been develop with difficulty
	10) They need a person capable of develop new techniques
	11) It's an important develop in agriculture
	12) I want to see the develop of this tree

The target words, incidentally, are all vocabulary items which the students have come across several times (a minimum of five) in previous classes either as part of a text or included in vocabulary activities. Nor are the errors in these examples isolated cases. They are representative of the same confusions made by at least one third of the subjects, in some cases more; in Sentences 1, 2 and 9, eighty per cent of the subjects committed the same error.

Sentence 1 seems perfectly correct until we look at what the student has given for the meaning of the target word (breeding). The translation given was *alimentar*, which in fact is the Spanish equivalent of 'feed' not 'breed'. This seems a clear example of synformy – in this case confusion over similar looking and sounding words compounded here by having related meanings. The same confusion has occurred in Sentence 2, while just to confirm the mix up 'bread' was given by one subject as a derivative of 'breeding'.

Sentences 3 and 4 also show confusion between similar words. In Sentence 3 the target word (sources), has been understood as 'resources', while the author of Sentence 4 clearly suffered from what we may perhaps call 'acute acoustic encoding interference' (remember that all the target words could be seen throughout the activity), as well as confusion over meaning (the Spanish word for 'source' (*fuente*) is the same as the word for 'fountain'). On questioning after the activity, the writer of Sentence 4 confirmed that he had understood 'source' as *fuente* and then re-translated this as 'fountain'.

There are several examples, and Sentences 5 and 6 are two of them, where students have given a correct Spanish translation of the target word but then chosen the wrong meaning in their *productive* use of the word.

Moreover, if Sentence 6 indicates a lack of familiarity

with the grammatical patterns of the suffix 'ing', Sentences 7 and 8, although grammatically and semantically correct, suggest a lack of familiarity with its phonological features – surprising when you think how frequent it is in English. However, various factors may come into play here. Research by Rodgers [26] and Gibson and Levin [8] cited in Laufer [16] suggests that words which are difficult to pronounce are harder to learn than words which are more easily pronounceable. Difficulties with pronouncing certain words (or rather phonemes or other sound unit) are often a consequence of the learner's L1 system. The sound represented by '~ing' is not a sound which is found naturally in Spanish and here it seems to have been lost as the word runs into the /t/ of 'to'.

Pronunciation problems may also be at the root of the errors in Sentences 9-12, although there may be other reasons. Spanish speakers do have difficulty with final consonants, but it still seems strange that even though many of the subjects gave *developed*, *developing*, *development*, as derivatives they didn't use these forms in their sentences.

Ryan [27: 183] speculates that L2 learners bring to their learning of the language a subconsciously acquired and developed set of language skill processes (specific to the L1) which "have been operating since the time when their first language was acquired". Perhaps speakers of phonetic languages (such as Spanish), then, rely too much on phonological processing when reading new words or accessing old ones. A phonological approach would be completely appropriate to these languages as their orthography is so regular (cf. [32] for example, in the case of Spanish) but not so appropriate for English as there are too many irregularites. Furthermore, for a word to be accessed via the phonological route, the entry in the lexicon must contain a phonological component; that is, it must include information as to how the word is pronounced. If that information is confused or incorrect in some way the word will be reproduced in a confused or incorrect way.

Maybe there is a good argument here for devoting class time to developing students' bottom-up processing skills so that words are recognised more automatically. "Good readers", says Paran [21], "do not rely on hypothesis formation and prediction as much as is commonly thought. Visual input and bottom-up processing during reading are of great importance".

These 'lower-order' skills are clearly important if learners are to achieve any sort of rapid and effective word recognition in the target language that some writers believe is so important. Coady [5: 279], for example, suggests that the 2,000 most frequent words should be learned "to the point of automaticity". There is also the question of which aspects of word recognition are important: the whole word, or recognition of common sound/spelling patterns? Or both? Whatever the case may be, knowing the form of a word enables the learner (i) to recognise the word and distinguish it from other words without the need to devote large amounts of processing resources (which can then be applied to comprehension, for example), and (ii) reproduce the word (in either spoken or written form) so that other readers will recognise it.

Remaining with Sentences 9-12, it has been argued [e.g. 9] that, for purposes of estimating vocabulary size at least, a word family should be taken as a single lexical item. That is, words related by inflectional or derivational affixations do not represent different items. Our experience, however, is that L2 students, unlike native speakers, are more often than not unable to work out or recognize the meaning of a derived word from its base form. They lack sufficient language resources to do this. Schmitt and Meara [29] also found in their study of Japanese students that they [the students] did not know many of the derivative suffixes or even the inflections for English verbs. Perhaps what these sentences show is that although learners have acquired sufficient semantic content of the word to cope with understanding, they are not sufficiently familiar with enough of its phonological features or its grammatical patterns to be able to produce it correctly.

CONCLUSIONS

What conclusions can we draw from the discussion above? Firstly, poor word recognition skills will result in inefficient processing, so explicit instruction of these skills seems necessary. Teachers should be aware of potential confusions caused by L1 orthographic or phonological processing procedures. Words that cause confusion can be focused on in order to clear up errors.

Secondly, in order to be able to read and understand L2 subject-specific texts more easily our students need to become acquainted with the most frequent vocabulary items related to their specialist field (although it is often low-frequency general words which cause difficulties rather than technical or semi-technical items), so that they have an as-large-as-possible sight vocabulary. The words to be focused on will be chosen on the basis of their frequency and usefulness, and selection has been made easier now through the use of computer-based corpora. A large sight vocabulary will also free up processing time.

Thirdly, we need to provide repeated exposures to target words in different contexts (re-cycling), and fourthly provide activities which encourage deeper and more active processing. Activities which go beyond simply memorizing new definitions, but rather encourage examining relationships between words and help build semantic networks.

Fifthly, it is clear that students often have only partial knowledge of a word. We should aim, then, not only at increasing the size of our students' lexicons, but also at increasing their control over its components.

Finally, it is important that students are made aware of the processes and strategies involved in vocabulary learning so that they themselves can develop those that work best for

them. We should ask them more frequently for feedback on different questions regarding the learning process in general, vocabulary learning in particular, and about the usefulness of the exercises and activities we organize in class.

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