

DEVELOPMENT OF LEXICAL COMPETENCE IN ESP

**Summary.** Multiword lexical units (MWLUs) are one of the basic features of vocational language [7, p. 125], especially in English. However, owing to their high level of informativeness and compact expression, MWLUs are difficult to process and understand, therefore special care needs to be taken when teaching them in the context of English for Specific Purposes (ESP). In order to examine the way in which MWLUs are processed, a survey was conducted using 20 most frequent multiword units, consisting of three or more elements, selected from a corpus of texts (the so called crawl corpus), made in SketchEngine, from the area of Marine Engineering. The survey was conducted on four groups of subjects, with the aim of analysing how much knowledge of the world and knowledge of the language help us in understanding these units. The study showed that participants with higher level of knowledge of the world understand and use MWLUs with more success than those without such knowledge, but that participants with higher level of language knowledge will reach for their metalinguistic knowledge in understanding such phrases. Finally, the results of the survey showed that the noun + noun phrases are easier to understand and sort than adjective + noun phrases. The findings are discussed in the context of ESP teaching.

**Keywords:** vocational language, multiword lexical units, knowledge of the language, knowledge of the world, ESP teaching.

**Problem statement.** Multiword lexical units (MWLUs) are “lexical units consisting of a fixed combination of more than one word” [10, p. 74]. They are formed by combining two or more lexical words into a syntactic and semantic unit that expresses a specific concept [8]. MWLUs are an efficient way of packing dense information content into as few words as possible [2]; e.g. a *reciprocating internal combustion engine* stands for ‘an engine where combustion occurs internally and which has a piston that reciprocates’. For this reason, MWLUs are commonly found in scientific discourse [5] as well as in vocational language [3; 6; 8; 10; 12].

However, the structure of MWLUs is not entirely predictable on the basis of grammatical rules only [10] and their meanings cannot be deduced from the meanings of individual members of MWLUs [2]. Consequently, MWLUs present a challenge both for students of vocational language, who often lack sufficient linguistic knowledge to easily process MWLUs and teachers of vocational language, who frequently do not possess enough technical knowledge to successfully cope with MWLUs.

**Structure of MWLUs.** MWLUs, from a syntactic point of view, consist of the following elements [2, p. 574]:

nouns [11]. Adjectives are definitely the most frequent premodifiers in English. When there is more than one adjective premodifying the same head noun, native English speakers prefer to order them in the following way [1, p. 180]:

Nouns also frequently appear as premodifiers in English. MWLUs in which the head noun is premodified by another noun often become co-lexicalized with time, i.e. they start to behave like compound nouns [4].

Due to the salience of adjective + noun and noun + noun MWLUs in English, we have chosen these structures as the focus of our research.

**Difficulty of understanding MWLUs.** Since MWLUs consist of strings of lexical words without any grammatical words that would point to the semantic relation between them, they are difficult to process and to understand [5]. Without any background (technical) knowledge it is, thus, very difficult to discern that e.g. *piston outlet lubrication oil temperature* stands for ‘the temperature of lubricating oil which is used to cool the piston and which is measured at the outlet’.

Furthermore, the relative sequence of elements in premodification does not specify the syntactic relationships between them [8]. For example, the first element in a 3-element MWLU does not necessarily modify the first word on its right, it can also modify the last word (i.e. the head noun). For example, in *plain bearing applications* the adjective *plain* modifies the first element on its right - the noun *bearing* (‘applications of plain bearings’). However, in *direct data processing*, the adjective *direct* modifies the last element in the MLWU - the head noun *processing* (‘direct processing of data’). Once again, in order to properly understand such complex MWLUs, the reader needs to resort to extralinguistic (technical) knowledge [5].

To conclude, both linguistic and technical knowledge are needed to successfully understand

Table 1

Basic structure of MWLUs

premodifiers	head noun	postmodifiers
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Languages, however, differ in the type of modification they prefer and the complexity of MWLUs’ structures they allow. The English language, which is the focus of this study, prefers premodification to postmodification [2] and allows for very complex MWLUs [9].

The most common premodifiers in English are adjectives, present (-ing) and past (-ed) participles (which behave as adjectives in premodification) and

Table 2

Order of adjectives in premodification

size	age	colour	material characteristics	national origin	head noun
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MWLUs. Further research is, however, necessary to examine the way in which these two elements aid the comprehension of MWLU and contribute to the development of lexical competence in vocational language (also referred to as English for Specific Purposes – ESP).

**The purpose of the article.** In view of all the above, this paper aims to analyse how much knowledge of the language and knowledge of the world help in the understanding of MWLUs in the vocational language.

More specifically, it aims to answer the following research question: Will knowledge of the language or knowledge of the world contribute more to the understanding of MWLUs in the field of Marine Engineering?

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The following hypothesis were formulated before the study was conducted:

H1: Participants with the knowledge of the world will be more successful in understanding MWLUs than participants with the knowledge of the language.

H2: Participants with the knowledge of the language will use their metalinguistic knowledge to assist them in understanding of MWLUs.

H3: Participants with neither the knowledge of the world nor the knowledge of language will have the most difficulty in understanding of MWLUs.

H4: All participants will understand the adjective + noun structures better than noun + noun structures.

H5: The participants with the knowledge of the language will understand structures less specific for Marine Engineering vocation easier than other structures.

#### Presentation of the main material.

The research consisted of two stages, the first one applying a corpus-based approach to extract the most frequent expressions. We started from a corpus compiled for the purposes of our previous research, which contains a collection of scientific papers from the Marine Engineering discourse. The 12 most frequent MWLUs found in it were used as the starting point for the analysis. Using the SketchEngine tool, these 12 terms were entered as seed words for the compilation of a web corpus counting 1,257,782 tokens, designated as *Marine Engineering\_web*. These were the following:

*piston, valve, pump, cylinder, gear, engine, diesel, internal combustion, crankshaft, camshaft, fuel oil, lubrication oil*

We know that these MWLUs belong to the specialized field because their occurrence in the focus corpus is much greater than their occurrence in the reference corpus. We found out that MWLUs consisting of 2 or even 3 (e.g. *internal combustion engine*) components tend to behave like single words and we believe they are perceived as single units. We then looked at the concordances of the five most frequent MWLUs and extracted 19 examples, shown in Table 3, all of them consisting of four or more components.

Table 3

#### The extracted MWLUs used in the survey

<i>lube oil primary circulating pump</i>
<i>turbocharger lube oil storage tank</i>
<i>centrifugal lube oil filter</i>
<i>auxiliary engine lube oil</i>
<i>lube oil circulating tank</i>
<i>engine lubrication oil circuit</i>
<i>internal combustion engine lubrication oil</i>
<i>aluminium alloy cylinder head</i>
<i>dual intake cylinder head port</i>
<i>cylinder head procedural steps</i>
<i>connecting rod needle bearing</i>
<i>phosphatized bushingless connecting rod</i>
<i>connecting rod angular speed radians</i>
<i>high pressure fuel oil tubes</i>
<i>fuel oil supply position</i>
<i>liquid fuelled internal combustion engine</i>
<i>vertical-shaft internal combustion engine</i>
<i>internal combustion chamber engine cycle</i>
<i>Large Bore Low Speed Marine Diesel Engine Cylinder Corrosion Action Analysis</i>

The second stage of the research included conducting a survey to test the subjects' understanding of noun phrases selected through the previous stage. The survey was made by means of Google Forms and it was distributed via e-mail. The final results are anonymous. The survey included the closed-type tasks of sorting jumbled words into a meaningful unit, a noun phrase. The target subjects for the survey were persons with work experience on board a ship with a limited knowledge of the language, the second group were students of Marine Engineering who have some knowledge of the world and some knowledge of the language, the third group consisted of English language teachers, who have an excellent knowledge of the language, but have no experience in this vocation, while the fourth group included teachers of vocational English. There were a total of 23 participants. The participants were distributed as follows:

Table 4

#### Number of participants according to the level of knowledge of the language

B level (CEF)	C level (CEF)
7	16

Table 5

#### Number of participants according to their experience in working on board

experience on board	no experience
7	16

Table 6

#### Number of participants according to the level of their formal education

Pre-grad.	Grad.	PhD	Other
5	6	7	5

The participants gave a total of 153 correct answers (35%), with the range between 0 and 13 and the mode 6. When taking into consideration

only the noun phrase heads, there were a total of 270 correct answers (62%), i.e. instances in which the participants correctly identified the head noun. Considering that the head noun contains the core meaning of the entire noun phrase, i.e. it is the bearer of the semantic load, it is interesting to see that the participants correctly identified the core meaning of the phrase. On the other hand, the head noun is often the word with the broadest meaning, e.g. system, analysis, etc. This metalinguistic knowledge helps those without the knowledge of the area to identify the phrase. This is also corroborated by the following results shown in Tables 7 and 8, where it can be seen that if taking into consideration the entire noun phrase, the participants with lower level of knowledge were more successful in solving the tasks. However, if we take into consideration only the head noun, we see that the participants with higher level of knowledge were better at identifying those, which means that their metalinguistic knowledge did help them to understand the core meaning of the phrase.

Table 7  
Number of correct answers according to the level of language knowledge

Level	Correct answers	Participants	Average
B	53	7	7,57
C	104	16	6,50

Table 8  
Number of correctly identified noun phrase head according to the level of language knowledge

Level	Correct answ. /head	Participants	Average
B	86	7	12,29
C	200	16	12,5

It should also be emphasized that these results were compared with the results of the corpus analysis keyness test, shown in Table 9, whereby the smaller keyness score indicates that the word is part of the general language, while the greater keyness score shows that the word is part of specific-purpose vocabulary. Here, the noun phrase heads as words with a broader meaning are also words with a lower keyness score, which makes it easier for the subjects without knowledge of the profession to identify and understand them.

Table 9  
Keyness score for some of the more frequent MWLUs

Multi-word lexical unit	Keyness score
<i>lubrication oil / lube oil / lubricating oil</i>	839.5
<i>cylinder head</i>	740.9
<i>connecting rod</i>	615.45
<i>fuel oil</i>	401.9
<i>internal combustion engine</i>	377.6
<i>aluminium alloy / aluminum alloy</i>	8.6
<i>circulating pump</i>	8.7

When considering the syntactic structure of the noun phrases, the participants were more success-

ful in sorting the noun+noun structures than adjective+noun structures, as shown in Table 10.

Table 10  
Number of correct answers according to syntactic structure

Syntactic structure	No. of phrases	Per participant
Adj + N	15	6.6
N + N	4	10.75

This may be explained by the fact that a noun modifying another noun as the head results in a compound noun, and in time the head and the modifier co-lexicalize, forming a firm connection between the units. Such nouns cannot be separated by an adjective, while on the other hand adjectives modifying a head noun do not form such firm connections, making them easier to break. This is shown in the following examples:

(1) *aluminium alloy cylinder head*.

The example contains firm noun+noun connections ('aluminium alloy' and 'cylinder head') which were recognized by the participants as units. On the other hand, the following examples:

(2) *centrifugal lube oil filter*

(3) *lube oil circulating tank*

represent a combination of adjective+noun and noun+noun units, whereby the participants were confused regarding to the position of the adjective within the phrase, as the link between these units is not so firm, while the noun+noun part of the MWLU was identified as a firm relation.

In order to see how the variables influence each other, we conducted a statistical correlation test. As Table 11 shows, the results showed a weak negative correlation between the variables of the level of education and success in sorting the phrases and the variables of the level of language knowledge and success in sorting the phrases. Although the correlation is not statistically relevant, it would be expected that the correlation would be much stronger, i.e. that the level of education and the level of language knowledge would have a much greater influence on the level of success and understanding of the phrases. On the other hand, the correlation between the variables of experience and success in sorting the phrases showed a moderate positive trend, which indicates that the experience gained, i.e. the knowledge of the world or encyclopaedic knowledge has an influence on the understanding of these lexical units.

Table 11  
Statistical correlation between variables

Correlation (r)	
Level of education/success	-0,15
Level of language knowledge/success	-0,19
Experience/success	0,39

**Conclusion.** The paper analyses the understanding and acquisition of MWLUs and the transition from syntactic competence to lexical competence in ESP on the one hand, and the importance of the knowledge of the language and knowledge of the world in the process of acquisition. In that sense, the analysis showed that the persons with the higher level of the knowledge of the world will



understand and use MWLUs with more success than those without such knowledge, which is corroborated by the greater number of correct answers and the statistical correlation between these two variables. Furthermore, the persons with the higher level of language knowledge will reach for their metalinguistic knowledge in understanding such phrases, which is shown by their level of success in recognizing the noun phrase head. The results of the survey showed that the phrases consisting of nouns are easier to understand and sort than those consisting of a combination of adjectives and nouns. In the end, the structures less specific for vocation-

al language according to their keyness score in the corpus analysis proved as easier to understand by persons without any knowledge of the area.

In future research, the survey results should be expanded by conducting a think-aloud protocol to note the participants' stream of thought during the task and get an insight into the logic behind the process. Another direction would be to study the understanding of such noun phrases in general English language or another area of ESP to see whether the level of knowledge of the world would have the same or similar influence on the understanding of these lexical units.

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