



STUDENTS' COMPETENCES IN MULTI-NOUN LEXICAL UNITS AND THEIR OPINION ON THE LANGUAGE TEST

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Abstract:

A special feature of English for Specific Purposes (ESP), particularly technical English are multi-noun lexical units (MNLUs) which are syntagms consisting of a string of nouns (noun + noun + noun +.....) appearing in great numbers especially in written specialized texts. Such texts serve as basic ESP teaching materials at institutions of higher education where English is taught as the first foreign language. The aim of this research paper is to establish students' competences in reception/interpretation and production of MNLUs at the end of the first academic year and at the end of the second academic year, the latter being the final year of institutionalized ESP teaching. The research sought to find out the extent to which students master these competences without targeted teaching and to establish whether the achieved level is satisfactory. A language test was used as the research instrument, followed by an open-ended question seeking to get the insight into students' opinions regarding the language test and MNLUs. The obtained data were analysed using quantitative and qualitative methods.

Keywords: English for Specific Purposes (ESP), multi-noun lexical units (MNLUs), students, lexical competences, language test

1. Introduction

Majority of the institutions of higher education offer the courses in English for Specific Purposes (ESP) as the first foreign language either as a compulsory or elective course. One of the principal learning outcomes of these courses is the students' lexical (vocabulary) development in a specific field of science. As future professionals, at the end of their institutionalized education students should be competent in reception/interpreting and production of multi-noun lexical units (MNLUs) as well, as a part of lexical development. The term *multi-noun lexical unit (MNLU)* is defined as a multi-noun syntagm consisting of two or more nouns functioning as a single lexeme (Polić,

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2019, 2020; Polić and Krelja Kurelović, 2021). There are various types of MNLUs according to the number of nouns they consist of (Poljć and Krelja Kurelović, 2021), which we illustrate by the following examples from technical English:

- two-noun lexical units: *noise barrier*,
- three-noun lexical units: *surveillance system improvement*,
- four-noun lexical units: *weather conditions observing system*,
- five-noun lexical units: *data transfer system improvement project*.

Students are usually expected to master the competences of receiving and producing MNLUs as a part of their specialized vocabulary development without targeted teaching incorporated into the syllabi of the ESP courses. In order to make the students' ESP competences as similar to those of native speakers, it is necessary that ESP teachers establish their students' competences in multi-noun lexical units (MNLUs) and improve these competences by targeted teaching in case they prove to be at an unsatisfactory level. Therefore, the aim of this research is to establish the level of students' competences in receiving and producing MNLUs without being previously exposed to targeted teaching of these competences.

The research questions for this study were as follows:

- 1) What is the level of the higher education students' competences in receiving and producing MNLUs in ESP?
- 2) Do the students achieve better test results in the competence of receiving MNLUs or in the competence of their production?
- 3) Does the level of MNLUs competences increase by the years of study?
- 4) What are students' opinions on the MNLUs language test?

To get answers to the above-mentioned research questions, a research was conducted with students of an institution of higher education using qualitative and quantitative methods.

2. Literature Review

A number of prominent scientists expressed their interest in MNLUs using various nomenclature to denote a sequence of nouns (noun + noun + noun + noun +) behaving in a sentence as a single lexical unit, naming them in various ways: *noun-noun compounds* (Warren, 1978), *complex nominals* (Bartolić, 1978; Levi, 1978; Izquierdo and Bailey, 1998), *nominal compounds* (Limaye and Pompian, 1991; Ferćec and Liermann-Zeljaka, 2015), *multi-noun compounds* (Newmark, 1985), *noun combinations* (Kvam, 1990), *noun compounds* (Master, 2003) and *noun clusters* (Carrió Pastor, 2008). Such a heterogeneity in nomenclature might create confusion among researchers and teachers-practitioners and therefore we use the term *multi-noun lexical units (MNLUs)* throughout the work, considering it the most appropriate according to the definition by Polić (2019).

Not many of the authors approached MNLUs from the Foreign Language Teaching (FLT) point of view, or included the students in their research, making it difficult for us to confront the results of our research to those of the previous researchers.

To best of our knowledge, those who did include participants, did not include statistical methods, which makes this work different from the others.

Limaye and Pompian (1991) included American students in their research. The students had to do a language test which consisted solely of three and four-noun lexical units, unlike ours which included MNLUs from two-noun lexical units to five-noun lexical units. They were interested just in MNLUs reception. One of their valuable conclusions was that the students showed better achievement in the task of paraphrasing MNLUs than in the multiple-choice task where they had to choose the correct paraphrase.

Considering MNLUs compressed definitions, Master (2003, 2004) points out their abundance in scientific and professional texts. He also notes difficulties in reception of these lexical units among non-native English speakers. He offers interesting types of exercise tasks, but does not conduct empirical research that would involve participants.

Carrió Pastor (2008) offers MNLUs learning strategies which could be useful in ESP teaching, emphasizing the importance of paraphrasing for the correct reception of MNLUs.

López-Jiménez (2013) discusses the problem of unsatisfactory status of MNLUs in English as a foreign language (L2) textbooks, but does not include participants or statistical analysis either.

Using an initial language test comprising MNLUs from two to five-lexical units in her research, Polić (2019) established students' competences in MNLUs immediately after enrolling their studies. The results achieved by students from three institutions of higher education (total of 167 participants) showed there was no statistically significant difference between their overall MNLUs reception ($M=11.87$; $SD=3.304$) and their overall production competences ($M=11.20$; $SD=4.067$).

As stated in the Introduction section, the present research seeks to investigate the students' competences in MNLUs at the end of the first and the second academic year, i.e. after the language input, but without exposing students to the targeted teaching of MNLUs.

3. Methodology

3.1. Participants

The convenient sample was composed of 98 undergraduate students ($M=57$ (58.2%), $F=41$ (41.8%), age $M=21.89$; $SD=4.829$) of technical studies at an institution of higher education, 47 of them being first year students and 51 second year student. Their knowledge of English as a foreign language upon enrolment is at least B2 level according to *Common European Framework of Reference for Languages (CEFR)*. Students attend 90 classes of the compulsory course *English for Specific Purposes (ESP - technical English)* each academic year. It is to note that these are two different groups of students. They were chosen for conducting this research because they have not been exposed to the targeted teaching neither of reception/interpretation nor of production of MNLUs and therefore suitable to express their unbiased opinion regarding the language test they have taken. Furthermore,

their scores on the MNLUs test enabled getting insight into differences between the students' competences in MNLUs after the first and after the second year of study.

3.2. Research Instrument

The research instrument was a written (paper + pencil) questionnaire consisting of four parts:

- 1) A written consent to participate in this study signed by the students.
- 2) Three demographic questions stating the participants age, sex and the year of study.
- 3) The language test.

Since there are no standardized language tests to assess students' competences in MNLU's reception and production in technical English, the ESP teacher designed the test herself according to the works offered by Master (2003) and Polić (2019, 2020). The language test consisted of three sets of tasks, as illustrated in Table 1. The first task checks the MNLU reception competences, while the remaining two tasks check production competences. All the tasks included MNLUs from two-noun lexical units to five-noun lexical units. Table 1 also offers the description of tasks by type and provides the examples of each of them. The last column specifies the numerical distribution of exam questions per task. In total there were 45 exam questions, all of them of the closed type, i.e. only one answer was correct.

Table 1: The design and composition of a language test

Task No.	Competence assed	Description of questions by type	Number of exam questions (45)
I	MNLU reception	Choosing the correct paraphrase of a MNLU – multiple choice questions (MCQs) with 1-3 distractors and one correct answer: glass fiber a) a kind of glass in the form of fibers b) a kind of fiber made from glass c) a kind of fiber used as glass	15
II	MNLU production	Producing a MNLU out of the offered paraphrase: a system used for the transfer of data = _____	18
III	MNLU production	Producing an English MNLU based on the offered meaning of a lexical unit in students' mother tongue (Croatian). The English nouns are offered in brackets in random order: sustav praćenja prometnog toka _____ (flow system monitoring traffic)	12

- 4) The fourth and the last part of the questionnaire was an open-ended question asking students to express their opinions regarding the language test.

3.3. Procedures

Both study groups (1st year students and 2nd year students) attended the courses in ESP with the same teacher and were not exposed to the targeted teaching/learning of MNLUs reception and production.

The questionnaire was delivered separately to both groups of students (1st and 2nd year students) in the last week of the academic year. They were informed that the questionnaire was used for scientific purposes and explained the content of the questionnaire. Besides, they were given the information that the questionnaire / language exam was to be completed under codes of their choice and therefore anonymity was guaranteed. They had the opportunity to give up, but no one wanted to take that opportunity. The questionnaire was delivered in the classic way (paper + pencil) and the students had 60 minutes at their disposal to complete it. After two weeks, the students were provided with the language test results under the codes they provided.

3.4. Data analysis

Demographic data and the data obtained from the language test were analysed using the SPSS 20 (Statistical Package for Social Sciences): descriptive statistics including t-tests.

Not all the students were keen on providing their opinion regarding the test: 41 out of 98 students provided their opinion, but some of those who provided their opinions gave more than one comment, sometimes even 3 - 5 sentences. All the students' answers were first typed / copied by hand, one under the other into the Word format document. According to the instructions of Miles and Huberman (1994), Milas (2005) and Bhandari (2020) regarding the qualitative research analysis, the subsequent step was identifying patterns and themes and finding connections in students' opinions, followed by the clustering of their answers. According to Milas (2005), counting is not just a feature of the quantitative approach. Sometimes we emphasize the frequent occurrence of an answer by counting its mention in the collected data, which was done in this case as well. The analysis ended by drawing conclusions and adding interpretations, presenting them in tabular form for the sake of clarity and reader-friendliness. For the purpose of this paper, the answers provided by students were translated from their mother tongue into English by the authoress of this paper herself. The translator tried to stay true to the way students expressed themselves, without proofreading and interfering with the writing style. It has to be emphasized that these are the students of technical studies, not future linguists, and therefore their style of writing and choice of words in expressing ideas is not the style of language experts.

4. Results and Discussion

The results of the research are presented in two parts. The first part presents results obtained by quantitative analysis of the language test (see 4.1.), while the second one presents results obtained by the qualitative analysis of students' responses to the open-

ended question asking them to express their opinions regarding the language test (see 4.2.). Each of the two parts is followed by discussion.

4.1. Results obtained by quantitative analysis

This section presents the results of the language test, establishing students' (1st year students and 2nd year students together) competences in *reception* and *production* of MNLUs. Their overall achievement did not exceed 60%. The dependent sample t-test indicates that there is a statistically significant difference in these competences ($t=3.588$; $df=97$; $p<0.01$). Overall students' scores are higher in MNLUs *production* ($M=0.58$; $SD=0.18$) than in their *reception* ($M=0.51$; $SD=0.18$), as shown in percentages in Figure 1.

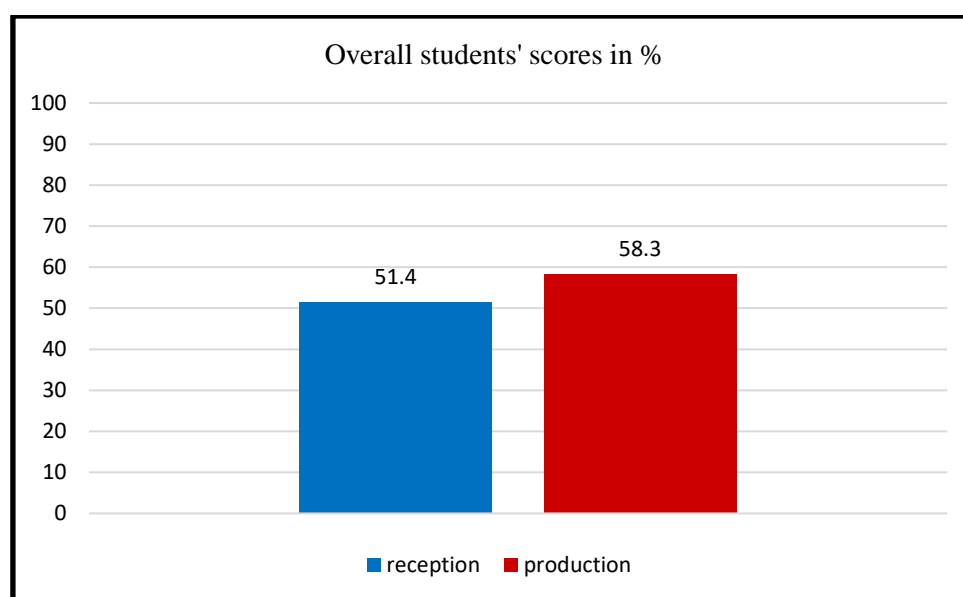


Figure 1: Overall students' scores in MNLUs reception and production

By establishing rather low overall score in both competences, which is less than 60%, we get the answer to the first research question regarding the level of higher education students' competences in receiving and producing MNLUs in ESP. It leads to a conclusion that the students should be exposed to targeted teaching and learning of these competences if their teachers wish to make them really competent ESP users. It is of utmost importance for students to master these competences, since MNLUs are found in all the fields of science and especially abundant in technical English.

As opposed to the previous Polić's (2019) research where no statistically significant difference between students' overall MNLUs reception and their overall production competences was found at the beginning of their studies, our work proves the difference. Our paper proves that the students achieve better test results in the competence of receiving MNLUs than in the competence of their production, by which the second research question is answered. However, it has to be pointed out that unlike participants in the above-mentioned research (Polić, 2019), our participants were exposed to the ESP input during one (1st year students) or two academic years (2nd year students).

This might lead us to the conclusion that the very ESP input, without the targeted teaching of MNLUs, affects more positively their MNLUs production than reception competences.

In order to find the answer to the third research question whether the level of competences in MNLUs increases by the years of study, some further data analyses were undertaken. The independent samples t-test shows a statistically significant difference in the MNLU *reception* between the 1st and 2nd year students ($t=-2.144$; $df=96$; $p < 0.05$). The 2nd year students are on average more successful in the MNLU *reception* ($M=54.74$; $SD=2.76$) compared to 1st year students ($M=46.83$; $SD=2.61$). The statistically significant difference was not found in the competence of MNLU *production* between the two groups of students ($t=-0.170$; $df=96$; $p=0.865$). The data analysis results for 1st year show ($M=57.88$; $SD=5.15$), while for 2nd year they are ($M=58.53$; $SD=5.90$). The results are presented graphically in percentages in Figure 2.

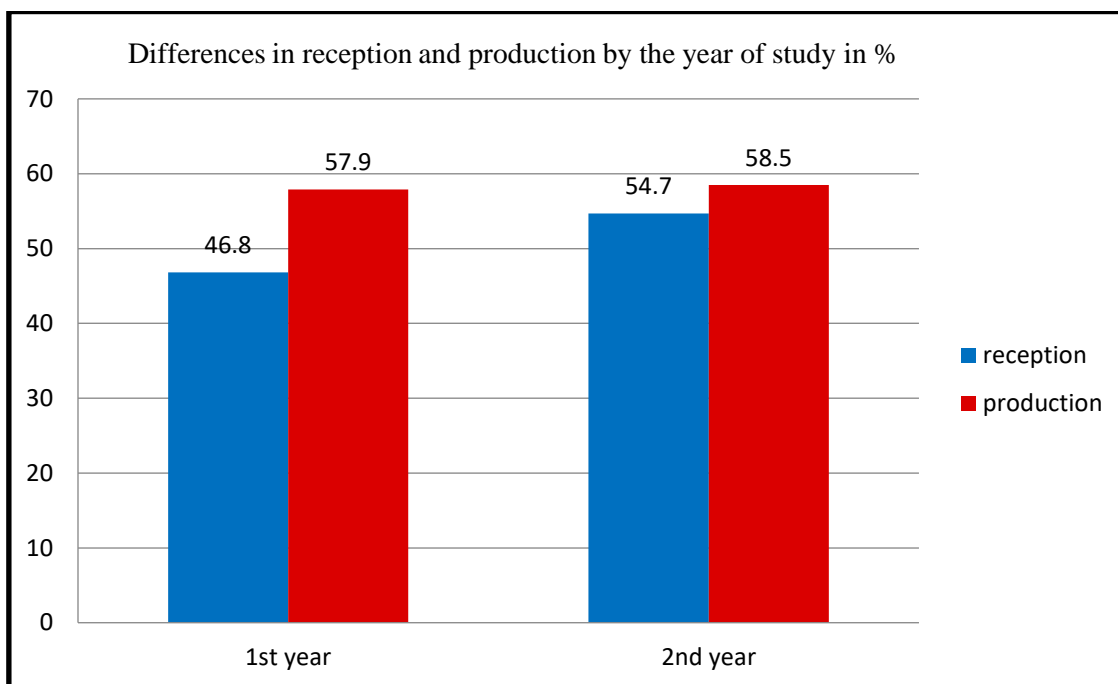


Figure 2: Differences in MNLUs reception and production by the year of study

Since there was no targeted teaching of MNLUs involved, and 2nd year students who were exposed to ESP input for one more academic year, achieved significantly better results in MNLUs reception, it can be concluded that the longer students are exposed to the ESP input the better their competences in the reception of MNLUs become. By the language input their knowledge of specialized field-oriented vocabulary increases, which could lead to better understanding of MNLUs as well. Besides, by attending other field-oriented courses they broaden their overall specialized/professional knowledge which helps them in better understanding of MNLUs in ESP. Better MNLUs reception competences in 2nd year students obviously increase spontaneously during the studies, while the MNLUs production competences stagnate. It could also be explained by the

fact that during the ESP classes students are more exposed to the reading of specialized texts in order to understand them, rather than producing specialized texts in English by themselves. Anyway, the results of the language test are rather poor indicating the need for the targeted teaching of both MNLUs reception and especially production.

4.2. Results obtained by qualitative analysis

The simple open-ended question was added to the questionnaire: *Please write your opinion on this language test.* Its purpose was to get an insight into students' opinions and their perception of the language test which presented a novelty to them. Since they have never been exposed to the targeted teaching/learning of MNLUs, this was their first encounter with this kind of language test and the types of exam questions. Table 2 presents students' opinions on the language test, clustered on the basis of similarity. Some of their illustrative quotes are added in italics. The number of students who commented the test in a similar way is written in the right column. The students' opinions are extremely important for ESP teachers because they can provide insight into students' motivation to learn to receive and produce MNLUs, helping the teacher in making decision whether to include them in the ESP syllabi. Besides, the students' comments can provide guidelines for designing future language tests and choosing the types of questions in them contained.

Table 2: Students' opinions on the test

Students' opinions on the test clustered per similarity	Number of students / answers
encourages / leads to / requires thinking	17
(very / quite / fairly) interesting / cool	29
requires concentration	2
(relatively / too) difficult / complicated / demanding	14
easy / not (too) difficult	7
useful / instructive / appropriate / suitable / student-friendly	12
OK / good / excellent / high-quality	9
contains specialized words we do not understand	23
Task II was the most difficult. <i>"I find it difficult to find the right order of words to express the meaning. Either I lack words, or I have a surplus."</i> <i>"It was hard for me to sort out the nouns in the right order."</i> <i>"I'm not sure in the right word order."</i> <i>"We need to rewrite the whole sentence by heart to get an abbreviated form."</i> <i>"I can't tell where to put words."</i> <i>"The hardest part for me was when I had to compose a sentence without using conjunctions and prepositions."</i> <i>"It was difficult for me to compose an exact expression from 4 or 5 words."</i>	16

Examining Table 2 leads to a conclusion that a lot of students found the language test interesting in different gradations (very / quite / fairly), or as some say 'cool', yet not denying it is cognitively demanding, since solving the tasks requires concentration. There were more students who found the language test difficult and demanding in various gradations (relatively/too) than those who regarded it easy. A number of students admitted the test encouraged thinking, yet they did not consider it a disadvantage. Quite the opposite, they said it was useful, instructive, appropriate, suitable and student-friendly. Although they consider it generally good, in different gradations from OK to excellent and high-quality test, they complained of not knowing the meaning of some specialized vocabulary contained in it. Besides, many students stated that Task II requiring the production of a MNLU out of the offered paraphrase (see Table 1) was the most difficult.

From the students' answers we can conclude that their overall attitude towards the language test is positive, that teaching MNLUs should be incorporated in the ESP syllabi, but also that the ESP teachers should teach MNLUs gradually from two-noun lexical units to four (and more) lexical units as suggested by Polić (2020), taking into consideration the students' knowledge of specialized lexis and avoiding to include in the language tests the lexis which the students are not yet familiar with. Regarding the difficulties with Task II they mentioned, our suggestion is to practice extensively the production of MNLUs out of the paraphrase during the classes, since Master (2003, 2004) and Carrió Pastor (2008) suggest it as the best strategy.

Obviously feeling at ease due to anonymity, some students felt free answering the open-ended question with absolute honesty and even expressed their feelings regarding the language test. Although their interesting quotes presented in the Table 3 were not initially forecast and therefore do not respond to any of the research questions, since they were unexpected, they still provide valuable guidelines to the ESP teachers concerning the language test. The following table offers their unexpected quotes along with our interpretation and inferences.

Table 3: Student's quotes and their interpretation by the authoress

Students' quotes	Authoress's interpretation / inferences
<i>"Encourages the development of some different methods for solving tasks."</i>	• vocabulary learning strategies
<i>"I see some parts of the English language that I know worse than others."</i>	• awareness of incompetence
<i>"So far, I thought I knew English well, but after this test I realized that it is not so."</i>	• frustration over incompetence
<i>"The test was relatively easy for me personally, but some tasks were difficult due to my lack of knowledge of the rules of how a certain expression should be composed."</i>	• awareness of the need for systematic teaching

The students' statements lead us to several conclusions:

- students are aware that they need to get acquainted with the ESP vocabulary learning strategies which should include MNLUs reception and production strategies because
- they are aware of their incompetence,
- they are frustrated over their incompetence, and
- they are aware that they need to be taught in a systematic way.

These quotes and interpretations make us conclude that by systematic teaching and including MNLUs learning strategies within vocabulary learning strategies our students will become competent ESP users who will not feel frustrated in the encounter with MNLUs.

5. Limitations and recommendations

There is one principal limitation of this study: it was conducted simultaneously on two different groups of students - 1st year students and 2nd year students of an institution of higher education. Our recommendation for the future research is a longitudinal research which would be performed on the same group of students, at the end of the first and then at the end of the second academic year, following the same methodology. Such a research would yield more accurate insight into assumed advancement in receiving and producing MNLUs that we expect at the end of the second academic year as compared to the end of the first academic year. Secondly, it would be interesting to investigate the same competences with the students (non-native speakers of English) who are learning some other ESP which does not belong to the technical sciences, but to another scientific field.

6. Conclusion

Multi-noun lexical units (MNLUs) which are a sequence of nouns (noun + noun + noun + ...) functioning as a single lexeme, make a significant part of English for Specific Purposes (ESP), especially in technical sciences where their usage is most prominent. Technical English tends to be very concise and precise, especially in its written form. Therefore, if the students learning ESP as the first foreign language wish to become competent ESP users, they should master MNLUs reception and production during the higher education. One of the aims of this work was to establish the students' level of these competences after the first and then after the second year of study, i.e. after one and two years of ESP language input, without being exposed to the targeted teaching of these competences. The statistical results of the students' achievement (1st and 2nd year together) in the language test proved disappointing, with the overall score of less than 60%. However, as proved by the research, the students achieve better results in the competence of MNLUs production than in their reception. Comparing the students' achievement separately after the 1st year of study and after the 2nd year of study dividing the competences into the MNLUs reception and in the MNLUs production, the research

proved that 2nd year students were on average more successful in the MNLU reception than 1st year students, while statistically significant difference was not found in the competence of MNLU production between the two groups of students. Accordingly, it could be assumed that the acquisition of specialized vocabulary spontaneously improves their MNLUs receiving competences.

Apart from offering a scientific contribution by investigating the students' competences in MNLUs reception and production involving quantitative analysis, this paper also presents a valuable practical and professional contribution to the ESP teaching. By the qualitative analysis of students' opinions on MNLUs language test an in-depth insight was obtained regarding their willingness to be taught the underlying principles and strategies of MNLUs reception and production.

Bearing in mind the rather unsatisfactory results of the MNLUs language test and the students' prevalently positive attitude towards it, it can be concluded that at the institutions of higher education students should not be deprived of the possibility to become really competent ESP users and therefore teaching and learning of MNLUs strategies should be included in their ESP syllabi, particularly the ones dealing with technical English.

Conflict of Interest Statement

The author declares no conflicts of interests.

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