

## SYNTACTIC COMPETENCE OF ESP MATHEMATICS AND NATURAL SCIENCES STUDENTS IN TRANSLATING TEXTS FROM SERBIAN INTO ENGLISH

### ABSTRACT

In the process of translation, students with a low level of L2 proficiency are very likely to encounter certain difficulties. This paper attempts to single out and analyse some of the most frequent errors made by students of mathematics and natural sciences learning ESP. In order to improve their Serbian-English translation classes, the most evident errors are being analysed with the focus on students' most obvious weak point – syntax. Speaking of the typology of errors, this paper focuses on errors related to syntax, as they are present to a great extent, while errors referring to phonology, semantics and lexis are disregarded. The errors are addressed as interlingual and the mother tongue interference is analyzed. Therefore, the paper discusses the matter of syntax with an aim to help students and improve their translation classes.

**Key words:** translation, syntax, error analysis, language proficiency, foreign language, language competence

## SINTAKSIČKA KOMPETENTNOST STUDENATA MATEMATIKE I PRIRODNIH NAUKA PRI PREVOĐENJU TEKSTOVA SA SRPSKOG NA ENGLESKI JEZIK

### APSTRACT

U procesu prevođenja, studenti s niskim nivoom L2 znanja će vrlo verovatno naići na određene poteškoće. U radu se pokušavaju izdvojiti i analizirati neke od najčešćih grešaka od strane studenata matematike i prirodnih nauka koji uče ESP. Kako bismo unapriedili nastavu prevođenja, analizirali smo najčešće greške, te se ispostavilo da je, pored neadekvatnog odabira reči sintaksa najslabija tačka. Govoreći o tipologiji grešaka, ovaj

rad se fokusira na greške iz oblasti sintakse, jer su one prisutne u velikoj meri, pri čemu se greške iz fonologije, semantike i leksike neće uzimati u obzir. Greške se tretiraju kao međujezičke pri čemu se analizira i uticaj maternjeg jezika. Prema tome, u radu se razmatra pitanje sintakse s ciljem da se pomogne studentima i da se poboljšaju časovi prevoda.

**Ključne riječi:** prevođenje, sintaksa, analiza grešaka, znanje jezika, strani jezici, jezička kompetencija

## 1. INTRODUCTION

Texts tend to have more than one function. Depending on the register, they provide information, send messages, motivate different interpretations, or, simply, introduce new knowledge. Speaking of non-English students' need for text interpretation, we may want to consider which aspects of the text they need to focus on because translation is not only the process of translating, but also the final result of it. Considering that English is an academic lingua franca, it is impossible for these students to keep track of all the achievements and references within the scientific field without understanding and translating the writing in English. As stated by Nord, a translator has two options: "...he either has to adapt the forms to target-culture conventions, thus making the phatic function work for the target audience or to explain to the target receivers that the forms used are meant to be phatic in the source culture" (1997: 139).

One of recent research studies conducted by Farrokh (2011) discovered that students made most errors related to the wrong selection of words, permutation, and wrong tense usage. In addition, Duangmanee (2014) and Sawalmeh (2013) both suggested that the most common errors students made during the translation process were the usage of structures typical of their mother tongue, wrong categorization of words and carelessness in translating.

Nurjannah et al. suggest a translation procedure that comprises the following four steps: "translation in the process of coding, translation in the process of team discussion, translation in the process of advanced coding, and ensuring the accuracy of translation" (2014: 2). On the other hand, when it comes to translator trainees, Colina claims that they should know "how text types bear on the translation process", as text types have distinctive language functions and the translation of a certain text type must successfully perform the language function (Colina 2003: 15). Still, our students were not actually translator trainees but, rather, students whose task was to adopt certain translation skills for the purpose of their own individual studies. Our target groups were students

of mathematics and natural sciences with a low level of English language proficiency and the purpose of analyzing their translations was to present the results of translating texts related to their profession in line with the curriculum.

Sattayatham and Honsa (2007) studied the most frequent errors made by medical students at a Thai college and concluded that subject-verb agreement and omission of subject were among them. They also stipulated that the results of the translation were related to the syntactic system of the Thai language. Jenwitheesuk (2009) also carried out a research study on the reasons behind L2 writing errors, which revealed that the errors were largely caused by the lack of syntactic knowledge.

A practical conclusion was reached by Leech (1994) as he pointed out that students must be reminded of the differences between their native language and the target language. As we shall see, it is precisely a strong awareness of one's mother tongue that affected the translation results. Students generally tend to transfer the syntactic preferences of their native language into the target language, which results in, to say the least, awkward English sentences which were difficult to interpret. Namely, "translation develops three qualities essential to all language learning: accuracy, clarity, and flexibility" (Ross 2000: 61). Therefore, we suggest that a strong awareness of their mother tongue may serve as a helpful tool for students who have mastered their native language.

On the other hand, a lack of highly developed skills in one's mother tongue may be a shortcoming when translating texts into other languages. We also suggest that good reading skills in one's own language may influence good reading and translation skills in any other target language.

## 2. MATERIALS AND DATA COLLECTION

We shall first consider the language proficiency and competence of students whose papers are the subject of this brief study. As we shall elaborate later on, the average translation results may be accounted for by multiple issues. As far as we can tell, interpretation and translation are conditioned by a number of reasons such as the issue of proficiency in the target language, first language literacy, and the very approach to the text.

The main objective was to collect and analyze the translation errors of Serbian students at the departments of Mathematics, Chemistry and Physics at the University of Banja Luka. The written samples of their translations were then reviewed and the syntactic errors were singled out. The data used in this study were exclusively collected from the translation exercises done in the classroom.

The Serbian texts given to the students were taken from textbooks used in other courses. The respondents were then instructed to translate the texts into English.

This research study is based on data collection, but we think that no corpus is large enough to cover all possible syntactic errors. Nevertheless, we believe that a corpus of 360 short text translations may be sufficient enough to get an insight into what should be improved in terms of syntax. Descriptive research methods were used in this study, but we also used the contrastive method, which proved to be useful in the retrospective explanations of errors.

Our small-scale research was conducted among 3<sup>rd</sup> year students majoring in Mathematics, Chemistry and Physics. For the purpose of this study, only those students at an intermediate or higher level in English were singled out, which resulted in the total sample of 90 students. The vast majority of students who participated in this study were female (70 %), while the age of both male and female students ranged from 21 to 26. Prior to translation exercises, students were particularly instructed to bear in mind the discrepancies between English and Serbian, which they had been taught in class. As part of their curriculum, they use textbooks published in English, even in courses other than English. In addition, students are being trained to read, translate and understand these texts. By the end of the course, they are expected to articulate and communicate their own professional and academic ideas and thoughts in English. Thus, the purpose of these translation exercises is to train students to express themselves in English, within their study field.

### 3. ERROR ANALYSIS

In this research, the respondents were given four texts from their own study field, i.e. four texts to translate from Serbian into English. They were given instructions to read the texts thoroughly and try to comprehend it as a whole before starting the translation. The tenses used in this study were the simple present tense, the present progressive tense, the simple past tense, the past progressive tense and the simple future tense. In addition, students were allowed to use dictionaries.

Learner errors can be categorized in terms of different criteria. *Interlingual errors* are said to occur due to L1 interference, whereas *intralingual errors* are committed regardless of L1 (Larsen-Freeman and Long 1991).

Richards (1974) classified errors, according to their causes, as follows:

1. Interlingual errors: these errors are caused by mother tongue interference.

2. Intralingual and developmental errors: this kind of errors occurs during the learning process of the second language at a stage when learners have not yet completely acquired the knowledge of the language.

The reason why this paper focuses on syntactic errors is that they were present to a large extent. As we shall see, the syntactic errors analysed in this research study seem to be influenced by the Serbian language and its interference with target language learning, i.e. English. We shall refer to these errors as interlingual due to the transfer of rules from the mother tongue into the target language. Furthermore, these errors may occur when someone does not have a native-level command of a language, which is the case of our respondents.

Speaking of the typology of errors, we disregarded those referring to phonology, semantics and lexis, and focused on errors related to syntax. The study resulted in a total of 360 short text translations, and some of the errors were singled out based on the data analysis:

<i>Povucite liniju kroz svako tjeme zadanog trougla i dobićete tri linije koje se u baricentru presijecaju.</i>	<i>Draw a line through every vertex in task triangle and <b>get three lines that in barycenter intersect.</b></i>
<i>Mnogo prije Pitagore, bili su svjesni pravila da trougao ima tri stranice i da je pravi ugao rezultat njihovog presijeka.</i>	<i><b>Many before Pythagoras were they aware that a triangle has three sides and right angle is result of intersection.</b></i>
<i>Koncept nule razvile su Maje 36. godine prije nove ere te postoje dokazi o sabiranju do nekoliko stotina miliona.</i>	<i><b>The concept of zero developed Mayas 36 BC and evidence exist about their sums up to hundreds of millions.</b></i>
<i>Rano je primijećen njegov talenat za nauku.</i>	<i><b>Very early it was noticed his talent for science.</b></i>
<i>Matrica je tabla ispunjena elementima na kojima pišu brojevi.</i>	<i><b>Matrix is a table filled with elements on which write numbers.</b></i>

Table 1. Most typical errors made by students of Mathematics

<i>U periodnom sistemu se nalaze svi do sada otkriveni hemijski elementi zajedno sa osnovnim karakteristikama.</i>	<i><b>In period system are all until now discovered chemical elements together with basic characteristics.</b></i>
<i>Iako studenti sami izvode vježbe, eksperiment pokazuje instruktor u laboratoriji.</i>	<i><b>Although students alone take out exercises, still the experiment shows the instructor at laboratory.</b></i>

<i>U reakciji kombinacije nastaje jedan produkt iz jednog ili više reaktanata.</i>	<b><i>In combination reaction appear one product from one or many reactants.</i></b>
<i>Kada se spajaju atomi dva ili više elemenata, nastaje hemijsko jedinjenje.</i>	<b><i>When combine atoms of two or more elements, becomes a chemical unity.</i></b>
<i>Ako za neki materijal kažemo da je provodnik, to znači da provodi električnu struju.</i>	<b><i>If for some material we say is conductor, it means he conducts electric current.</i></b>

Table 2. Most typical errors made by students of Chemistry

<i>Alfa čestica nastaje alfa raspadom radioaktivnog atomskog jezgra.</i>	<b><i>Alpha particle becomes alpha decay of radioactive atomic nucleus.</i></b>
<i>Cijepanje teškog jezgra u stabilnije lako jezgro nastaje nuklearnom fisijom.</i>	<b><i>Splitting of heavy nucleus in a stable easy nucleus becomes in nuclear fission.</i></b>
<i>Vektorska brzina je udaljenost koju pređe neko tijelo po jedinici vremena.</i>	<b><i>Velocity is distance that passes some object in a unit of time.</i></b>
<i>U mehanici razlikujemo gravitacionu potencijalnu i elastičnu potencijalnu energiju.</i>	<b><i>In mechanics, it has difference between gravitational potential and elastic potential energy.</i></b>
<i>Potencijalna energija je energija položaja koju tijelo ili čestica imaju zbog svog položaja u nekom polju sila.</i>	<b><i>Potential energy is the energy of position which it has the object or the particle because of position in some field of forces.</i></b>

Table 3. Most typical errors made by students of Physics

Corder (1973) classified errors according to their processes; i.e. ways in which errors are made by language learners. There are four main processes in Corder's taxonomy: omission (omission of some required elements), addition (addition of some unnecessary or incorrect elements), substitution (selection of an incorrect element) and permutation (misordering of elements). Misordering of elements occurs when students write a correct sentence but switch the position of two words.

When it comes to word order at the sentence level, respondents tend to place the verb before the subject in English, which we assume is due to their native language interference. Word order in Serbian is more flexible than that in English where word order is relatively fixed and follows the *subject/verb/object* pattern. Table 4 shows the errors concerning word order and sentence structure.

Language feature	Transfer error in English	Frequency of errors
Word order and sentence structure:		
<ul style="list-style-type: none"> <li>Subject –Verb – Object misordering</li> </ul>	<p><i>Velocity is distance <b>that passes some object</b> in a unit of time.</i></p> <p><i>The concept of zero developed Mayas 36 BC and evidence exist about their sums up to hundreds of millions.</i></p>	12 times
<ul style="list-style-type: none"> <li>Redundancy</li> </ul>	<p><i>Alpha particle becomes alpha decay of radioactive atomic nucleus.</i></p> <p><i>Potential energy is the energy of position <b>which it has the object or the particle</b> because of position in some field of forces.</i></p> <p><i>When combine atoms of two or more elements, becomes a chemical unity.</i></p>	11 times

Table 4. Language transfer errors from Serbian into English

The two language features recognized as most typical errors were redundancy and S-V-O misordering. We shall now consider one of the transfer errors we discovered within our data corpus: *Velocity is distance that passes some object in a unit of time*. Namely, the word order in Serbian is known to be not as fixed and uniformed as it is in English. In this case the student did not follow the word order rule in English and directly transferred the Serbian word order. The expected translation would obviously be *Velocity is the distance that an object passes in a unit of time*. Furthermore, the non-adherence to the word order pattern resulted in switching places of the object and subject in an English sentence, what ultimately affected the meaning. From one such translation we may infer that it is the distance and not an object that passes a certain distance in a unit of time.

The same syntactic errors affected the meaning in examples such as:

- The concept of zero developed Mayas 36 BC and evidence exist about their sums up to hundreds of millions.*
- Although students alone take out exercises, still the experiment shows the instructor at laboratory.*
- Very early it was noticed his talent for science.*

As we may see in a), b) and c), the word order was again literally copied from Serbian into English. Not only was the syntax of the sentences grammatically unacceptable, but the semantics was affected as well. In a), it seems that it was *the concept of zero* that *developed Mayas* and not the other way around as the expected translation would be: *The Mayans developed the concept of zero in 36 BC*. Although they were taught and advised that English and Serbian syntax differ substantially with regard to word order, the students still displayed a tendency to use the subject, the verb and the object loosely, such as in b) *Still, the experiment shows the instructor at laboratory*. Namely, the word order choice affected both the syntax and semantics of the resulting English sentences. Despite the fact that students had been instructed to use the SVO word pattern in English, they nevertheless disregarded the rule. A reasonable explanation might be the fact they were distracted by and occupied with the Serbian textual content, so their native language syntax prevailed in spite of the instructions they had been given.

As we may infer, most common errors made by our students were related to their faulty competence in syntax. Speaking of syntax, the typical word order error occurred quite often, which may indicate that they were burdened with a strong awareness of their mother tongue.

Regardless of the expected translation, the result of a wrong translation is a potentially vague meaning and wrong interpretation (e.g. *Alpha particle becomes alpha decay of radioactive atomic nucleus*.). Word order turned out to be a weak point since it was typical of the Serbian language. This led us to conclude that the respondents were mostly unable to draw a line between their mother tongue and the target language, which resulted in numerous syntactic errors. However, there might be another reason for the wrong word order usage. We do bear in mind the fact that the chosen students are not highly proficient in English and that they use it as a helpful tool. Still, if their language awareness is poor, can it account for so many syntactic errors? We believe not. Even though the students may be burdened with a strong awareness of their mother tongue, basic syntactic rules such as word order are expected to be followed more easily. In this instance, we imply another possible reason, i.e. carelessness in translation. To be more exact, we believe that students tend to focus more on the process of translation rather than the results. In addition, they are still not capable of focusing on the target language in order to free themselves from the burden of their native language.

A strong influence of their mother tongue and carelessness in translation may also account for syntactic errors in:

- a) *Potential energy is the energy of position which it has the object or the particle because of position in some field of forces.*

- b) *When combine atoms of two or more elements, becomes a chemical unity.*  
 c) *Draw a line through every vertex in task triangle and get three lines that in barycenter intersect.*

Here, we witness the most common word order error: subject-object position switch. The students displayed a tendency to literally copy the possible object-subject word order from Serbian, once again resulting in a confusing English sentence, as in b) or c). Thus, there is a typical Serbian structure *nastaje hemijsko jedinjenje* in b), which resulted in a non-typical and ungrammatical English construction: *becomes a chemical unity*. Again, in c), word order acceptable in Serbian: *tri linije koje se u baricentru presijecaju*, resulted in an irregular English construction: *three lines that in barycenter intersect*.

Students tend to search for *equivalence*, i.e. they persistently draw parallels between the foreign language and their mother tongue. This word-to-word translation may be accounted for by the fact that students of Mathematics, Physics and Chemistry are simply not motivated enough to improve their language skills. Here, we are facing a dilemma – fluency or accuracy. In other words, should we focus on meaning and context or grammatical structure? The balance between these two approaches may seem hard to achieve, so we may wonder which approach is better for students of mathematics and natural sciences. When it comes to more complex processes, i.e. creative thinking, interpretation, language difference awareness, general language awareness and syntactic differences and compatibilities, the results are poor and substandard.

#### 4. CONCLUDING REMARKS

Our brief research targeted at revealing some of the most common errors Serbian students make in their translations. Syntactic errors were singled out as the most commonly occurred ones and they reflected a strong awareness of the mother tongue among many students. Results regarding word order and sentence structure unmistakably suggest that the respondents did nothing but copied the word order and sentence structure from their own mother tongue while translating the sentences. In addition, the students displayed a high degree of accuracy when it came to tense or article usage. This leads us to a final conclusion that the errors were not due to their poor knowledge of grammar, but, rather, to the strong influence of their mother tongue.

These findings may provide clear guidelines as to what ESL classes should focus on in order to train successful authors or translators. This might help students who do not major in English to become competitive international

researchers and authors in their own field of study. Still, the question remains how exactly we can help students overcome the interference of their native language and the target language, in order to better translate or write professional texts. A great workload that ESL teachers are affected by is no excuse for repeatedly poor feedback. Admittedly, we cannot expect non-English students who major in a field other than linguistics to be excellent translators or writers. The intrinsic motivation and ambition of students play an important role when it comes to SL learning. A student of physics can hardly be expected to be fluent in English if (s)he is not driven by an eagerness to advance. What we, as teachers, have to focus on is not only how to motivate them. On the contrary, it is us who should always bear in mind the potential interference of the mother tongue and the target language and try to bridge the well-known (syntactic) gap.

As for the pedagogical implications, students should be encouraged not to be afraid to make mistakes but also to learn from them. As teachers, we must help them overcome the fear of making errors and teach them that the only way to achieve fluency is self-motivation and willingness to deal with the errors they make.

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## SINTAKSIČKA KOMPETENTNOST STUDENATA MATEMATIKE I PRIRODNIH NAUKA PRI PREVOĐENJU TEKSTOVA SA SRPSKOG NA ENGLISKI JEZIK

### Sažetak

Očekuje se da studenti koji u dovoljnoj mjeri nisu savladali strani jezik pri prevođenju nailaze na određene poteškoće. Osim toga, prevođenje se ne odnosi samo na čin prevođenja nego i na krajnji rezultat takvog procesa. Pored poznavanja gramatike i leksike, studenti se pri prevođenju moraju osloniti na sopstvene ideje kako bi interpretirali i preveli zadate tekstove. Cilj ovoga rada je bio da se izdvoje i analiziraju najčešće greške u prevodima studenata prirodnih nauka koji engleski jezik izučavaju kao obavezan predmet tokom osnovnih studija. Kako se engleski danas smatra univerzalnim akademskim jezikom, gotovo da je nemoguće da studenti prate najvažnija dostignuća iz svojih oblasti bez razumijevanja tekstova napisanih upravo na engleskom. Tokom studija, studenti prirodnih nauka često se sreću sa radovima koje treba da prevedu ili iščitavaju, a napisani su upravo na engleskom jeziku. Kako bismo unaprijedili nastavu prevođenja, analizirali smo najčešće greške, te se ispostavilo da je, pored neadekvatnog odabira riječi, sintaksa najslabija tačka. Krenuli smo od pitanja da li je razlog lošeg prevođenja ciljnih tekstova nedostatak jezičke kompetencije ili možda prejaka svijest o maternjem jeziku. Iako su pravili mnogo sintaksičkih grešaka, ispitanici su rijetko griješili pri odabiru, recimo, glagolskih vremena. Stoga smo zaključili da problem nije u nepoznavanju bazičnih gramatičkih pravila jer su ih studenti sa lakoćom reprodukovali. Na osnovu analiziranih grešaka došli smo do zaključka da studenti najčešće preslikavaju sintaksičke obrasce iz maternjeg jezika u ciljni jezik, što dovodi do nejasnih i redundantnih prevoda, te da je prejaka svijest o maternjem jeziku upravo onaj segment nastave stranog jezika na kojem zajedno treba da rade kako nastavnici tako i studenti.

**Ključne riječi:** prevođenje, sintaksa, analiza grešaka, strani jezik, lingvistička kompetentnost.

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