

ESP AND INTERNATIONALIZATION OF HIGHER EDUCATION AND RESEARCH

*Biljana Mišić-Ilić, Filozofski fakultet u Nišu, Srbija,
biljana.misic.ilic@filfak.ni.ac.rs*

*Jasmina Đorđević, Filozofski fakultet u Nišu, Srbija,
jasmina.djordjevic@filfak.ni.ac.rs*

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Abstract: The growing internationalization of higher education and scientific research and publishing, characterized by the dominant use of English as the language of instruction and publication, has spurred the need for highly specialized, tailor-made ESP courses for university staff and researchers. The proliferation of English Medium Instruction (EMI) has created a new requirement for university teaching staff to acquire not only general English and ESP proficiency, but also pedagogical and intercultural communicative competences. ESP for particular scientific and technical disciplines, as well as EAP and academic writing instruction in particular, have already gained some ground and acquired a sound tradition in non-Anglophone academic institutions. Therefore ESP, broadly understood as an approach to language teaching that targets the academic or occupational needs of learners, and focuses on the necessary language, genres and skills to address these needs, can now rise to the challenge of combining EMI, terminology-oriented ESP for particular disciplines, and EAP. The article presents a specialized course created for the purpose of developing competences for teaching in English and academic writing, as part of the Erasmus+ project Strengthening Teaching Competencies in Natural and Mathematical Sciences (TeComp). In the empirical section, the article presents the results of a needs analysis carried out among prospective learners (university teachers and young researchers) in the fields of natural and mathematical sciences at four Serbian universities, included in TeComp. The proposed course, based on the theoretical principles of ESP (Dudley-Evans; Anthony) and EMI (Macaro), as well as on the needs analysis, combines certain components of EMI and academic writing, while addressing particular scientific disciplines and learners.

Keywords: internationalization of higher education, English as Medium of Instruction (EMI), English for Specialized Purposes (ESP), academic writing instruction, ESP for natural and mathematical sciences

Introduction

The growing internationalization of higher education (HE) and scientific research and publishing, characterized by the dominant use of English as a language of instruction and publication, has spurred the need for highly specialized, tailor-made ESP courses for university staff and researchers. The proliferation of English Medium Instruction (EMI) has created a new requirement for university teaching staff to be not only proficient in English for general purposes and familiar with the discipline-specific terminology in English, but also to gain a range of additional competences in order to be able to teach their courses in English and to publish their research in English. Such competences include the awareness of the specificities of English Medium Instruction (EMI) and the specific English language competences, pedagogical competences, intercultural communicative competences, as well as academic writing competences in English.

This article addresses the social background and theoretical aspects of ESP and EMI in the context of internationalization of HE and research, and illustrates the issue with a course aimed at developing competences for teaching in English and academic writing for university teachers of natural and mathematical sciences. The central section describes in detail the design of the course and the results of the needs analysis performed in order to gain more precise insight into the particular teaching and writing practices, experience, language knowledge and needs of the prospective participants. The concluding section of the article highlights the importance of the ESP and EMI theoretical grounding combined with empirical research for creating courses that would be specifically tailored to meet the needs of university lecturers, staff and students in the context of increased internationalization of HE and research.

Social background and motivation

It has been widely recognized that internationalization in education, HE in particular, has surged in the past couple of decades. In order to increase their visibility and significance in the globally connected world, universities strive to incorporate international components into their academic activities, research, administration and public presence. Internationalization of HE is particularly visible in the evidently increasing incoming and outgoing mobility of students and staff, internationalization of study programmes and curricula as well as international cooperation among HE institutions (HEIs) (e.g., in joint degree and joint diploma programs). In such context, most often, the language of communication and instruction is English, as documented in numerous examples in Dimova, Hultgren and Jensen.

In a similar vein, in the realm of scientific research, internationalization is manifested in the growing international scientific cooperation among researchers from various institutions and disciplines, resulting in international research

projects, where, again, the working language is most likely to be English. Moreover, the use of English is also increasing in scientific publications (Alastrué and Pérez-Llantada). Even in locally-published scientific journals, researchers publish in English, in order to increase their international scientific audience and impact.

In such social and academic environments, there is a recognized need for special instruction for university teaching staff to be not only proficient in general English but also to have additional competences for academic purposes. In particular, these should include the following: 1) reading relevant scientific literature in English; 2) discipline-specific academic and scientific writing; and 3) teaching specific academic subjects in English. It is such content elements that should be the primary components of ESP courses designed for university staff.

There are various stakeholders that have slightly different but highly inter-related and compatible motivations to help develop such specific English language competencies of teaching staff in order to enhance the internationalization of HE and research. These include national ministries of education and scientific development, the management of particular universities and faculties, and finally, but by no means least important, university teachers themselves. While the policy and decision makers (ministries, university management) are motivated for, interested in and responsible for providing the administrative setting and financial support for specialized courses to be organized and promoted, university teachers are intrinsically or extrinsically motivated and stimulated to attend such courses.

The role of English-language professionals in this setting is to act as an intermediary between the various stakeholders and the specialized content that is taught, and to design and implement specialized training to meet the particular needs of university teachers. As stated by Tuomainen (232),

tailored, specific language and teaching practice can encourage non-native university teachers to embrace both the language and the teaching practices and forgo insecurity about the use of English for academic and field-specific instruction.

Theoretical background

The theoretical framework for this article is defined primarily by two areas of applied linguistics – the well-known and well-established English for Specific Purposes studies (ESP) and a more recent and more specific one, English Medium Instruction (EMI). This section will briefly outline both areas, while the following segment will demonstrate how particular elements of each of them have been incorporated in the design of a specialized course aimed at developing competences for teaching in English and academic writing for university teachers of natural and mathematical sciences.

English for Specific Purposes (ESP)

The term Language for Specific Purposes (LSP) is generally used to refer to the teaching and research of language in relation to the communicative needs of speakers of a second language in facing a particular workplace, academic, or professional context (Basturkmen and Elder 672).

With English as a global language, LSP is most often applied to English while other languages, such as French, Spanish and German are now investing equal interest and effort in developing LSP in their own language-specific contexts. Nevertheless, practice and research in ESP are very well-developed so that ESP often serves as a model for other LSP contexts (Šorgić and Đorđević). ESP is an approach to English teaching that identifies and targets current and/or future academic or occupational needs of particular learner populations, focuses on the necessary language, genres and skills to address these needs, and designs courses whose content and aims are oriented to the specific needs of the learners, using general and/or discipline specific teaching materials and methods (Anthony 10-11; Paltridge and Starfield 2). Two main subfields within ESP are English for occupational purpose (EOP) and English for academic purposes (EAP) which are based on the contexts in which English education takes place and the learners' English learning purposes. In particular, EAP focuses on ESP in academic settings, and is perhaps the most influential branch of ESP (Anthony 13).

According to the still influential characterization of ESP, it is possible to describe ESP through a set of absolute and variable characteristics (Dudley-Evans; Dudley-Evans and St. John):

Absolute Characteristics include:

1. ESP is defined to meet specific learners' needs.
2. ESP makes use of the underlying methodology and activities of the discipline it serves.
3. ESP is centred on the language appropriate to these activities in terms of grammar, lexis, register, study skills, discourse and genre.

Variable Characteristics are as follows:

1. ESP may be related to or designed for specific disciplines.
2. ESP may use, in specific teaching situations, a different methodology from that of General English.
3. ESP is likely to be designed for adult learners, either at a tertiary level institution or in a professional work situation.
4. ESP is generally designed for intermediate or advanced students.
5. Most ESP courses assume some basic knowledge of the language systems.

ESP for particular scientific and technical disciplines, as well as EAP and

academic writing instruction in particular, have already gained ground and acquired a sound tradition in non-Anglophone academic institutions, including Serbia (Mišić Ilić 2011). The design of the course described in the following text capitalizes on that experience.

Therefore ESP, broadly understood as an approach to language teaching that targets academic or occupational needs of learners, and focuses on the necessary language, genres and skills to address these needs, can now raise the challenge of combining EMI, terminology-oriented ESP for particular disciplines, and EAP.

English Medium Instruction (EMI)

The term *English Medium Instruction* (EMI) is usually defined as the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language (L1) of the majority of the population is not English. (Dearden 4).

It can be also used to mean *English as a Medium of Instruction*, and it broadly refers to the English language used by teachers, who teach various content subjects, to achieve instruction and communicative objectives of the course. It shares some characteristics of but is not identical to EFL (English as a Foreign Language), EAP (English for Academic Purposes) or ESP (English for Specific Purposes), although the teachers and students speak English as a foreign language, in academic (higher education) settings, and use it to communicate the content related to a specific discipline. The main difference is that EFL, EAP and ESP are intended to teach English, whereas EMI is not intended to teach English, but another content discipline, in English. It should be also distinguished from the approaches to language teaching such as CLIL (Content and Language Integrated Learning), and from the communicative aspects of English use such as ELF (English as a Lingua Franca).

As detailed in Macaro (2018; 2020), important aspects to consider in any EMI setting are *language, teachers, students* and *content*, which all interact in a particular social and academic *context*, as shown in Figure 1.

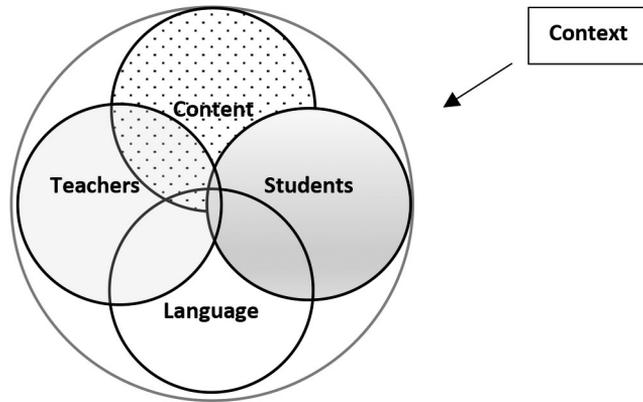


Figure 1. Aspects of EMI

Since EMI is done in English (with a possible minor use of L1 if the teachers and the students share it), the teachers need a higher level of proficiency for relatively smooth lecturing, but it does not necessarily include near-native pronunciation or flawless grammar. It is not so much about ‘good English’ as about providing good understanding of what the teacher wants to communicate in English as well as having a sufficient range of general and discipline-specific vocabulary, and interaction skills to communicate with EMI students. It especially means using various strategies to explain subject-specific terminology to the students and using simplified sentence structures to communicate, if necessary. The teaching style in an EMI setting needs to change from a teacher-led style to a more dynamic one. A good EMI teacher is able to create an interactive environment in class, is aware of and can accommodate potentially diverse cultural backgrounds that the students bring into the classroom. Students in an EMI setting, depending on the local context, are different groups of both local and international students, whose language competences may be very diverse. That could pose a problem in class, so that sometimes local students are not even taught in a single class together with international students.

However, for the internationalization of a HEI, it is very important not to separate international students from local ones. While the general English proficiency of EMI students may not be low, they nevertheless often claim to find the technical words difficult. Even though it is not the explicit goal of EMI to improve the students’ English language proficiency (as it is in EFL or ESP teaching), they may indeed improve it, simply by being exposed to English and assisted by their teachers to understand particular academic content. Regarding the academic content that is taught in a certain academic course, it may be an issue whether it should be the same as taught in L1, or if EMI teachers should make any changes in the content, in terms of reductions, simplifications or any

other differences. Sometimes the content has to be delivered at a slower pace, with more repetitions, and more attention paid to key terminology, so that EMI students can fully understand it. Of course, it is not the same for different disciplines; for instance, the content in mathematics is less dependent on verbal output than the content in social sciences.

Teaching and Academic Writing in English (TAWE)

Following institutional and academic policies, in order to address the academic and professional needs of a particular group of learners, we designed the specific ESP course *Teaching and Academic Writing in English (TAWE)*, which will be described in this section. A particular challenge was to make it a combination of EMI, terminology-oriented ESP for particular disciplines, and EAP.

Background information

The course *TAWE* was designed as part of the Erasmus+ project *Strengthening Teaching Competencies in Natural and Mathematical Sciences (TeComp)*, coordinated by the University of Niš.¹ The project addresses the needs of university teachers of natural and mathematical sciences. Only a small segment of the project activities is related to developing English language competences, and they are limited to 1) creating material for providing language support for teaching staff; and 2) training for teaching and academic writing in English. The general needs analysis for all the project aspects was done prior to the project application, while a more specific one, targeting needs related to English competences was done prior to the *TAWE* course. The course has its predecessors in three series of EMI courses implemented at four largest state universities in Serbia (Belgrade, Novi Sad, Niš, Kragujevac). The first one was in 2016, within the Tempus project *Fostering University Support Services and Procedures for Full Participation in the European Higher Education Area (FUSE)*², coordinated by the University of Niš. The other two were within the National Erasmus+ initiative *Study in Serbia* (2019 and 2021).³ The participants and the EMI lecturers were university teachers from the four participating universities.

Within the *TeComp* project, the new *TAWE* course was developed with the aim to cover the topics both for teaching in English and academic writing in English for university teachers of natural and mathematical sciences. The course is a specialized course (24 classes, grouped in eight 3-hour sessions), and is to

¹ <http://www.tecomp.ni.ac.rs/>

² <http://www.fuse.ni.ac.rs/>

³ <https://www.studyinserbia.rs/en/vesti/2019/09/language-training-internationalization-higher-education-serbia> (2019) and <https://tempus.ac.rs/javni-poziv-za-prijavlivanje-nastavnika-na-obuku-za-izvodjenje-nastave-na-engleskom-jeziku/> (2021)

be implemented at four partner state universities in Serbia with four groups of about 20 participants (junior and senior teaching staff at natural science and mathematical faculties), whose entry level of English is at least B2. The course is primarily practical, interactive, with lots of individual, pair and group activities as well as peer and teacher evaluation and feedback. The course is accompanied by a corresponding handbook (currently available for the project and course participants only, but intended to be distributed in an e-book format later) (Mišić Ilić, Đorđević, Tatar 2021). The course will use a dedicated project webpage, for storing numerous additional material (links to videos, additional reading material, etc.)

Needs analysis

Given the very specific target group who was expected to attend our *TAWÉ* course, we conducted a needs analysis prior to the course to fine-tune the course content and to identify the attendants' opinions of their needs regarding such a specific course. For that purpose, we prepared and distributed a questionnaire via Google Forms. The questionnaire consists of 22 closed-ended questions and we managed to collect a total of 86 responses before the realisation of the course.

A total of 70.9% female and 29.1% male participants responded to our questionnaire coming from various scientific disciplines within the natural sciences from the four largest universities in Serbia (Mathematics – 29.1%; Chemistry – 20.9%; Biology – 14.0%; Physics – 12.8%; Geography – 2.3% as well as from other disciplines, such as Computer Science, Biochemistry and Environmental Sciences – 20.9%) (Table 1). As far as the respondents' academic positions are concerned (Table 2), the majority of them are Full Professors (31.4%) and Assistant Professors (30.2%) pointing to the fact that most of the respondents are mid-career or highly experienced higher education teachers (27.9% reporting 10–20 years of experience and 33.7% reporting more than 20 years of experience) (Table 3).

Discipline	Respondents	
	%	No
Mathematics	29.1	25
Biology	14.0	12
Physics	12.8	11
Chemistry	20.9	18
Geography	2.3	2
Computer Science, Biochemistry, Environmental Sciences	18	20.9
Total	100	86

Table 1. Distribution of participants according to discipline

Academic position	Respondents	
	%	No
Full Professor	31.4	27
Associate Professor	12.8	11
Assistant Professor	30.2	26
Teacher Assistant with PhD	11.6	10
Teaching Assistant	9.3	8
Researcher	4.6	4
Total	100	86

Table 2. Distribution of participants according to academic position

Experience in higher education	Respondents	
	%	No
less than 5 years	9.3	8
5–10 years	29.1	25
10–20 years	27.9	24
more than 20 years	33.7	29
Total	100	86

Table 3. Distribution of participants according to experience in higher education

Regarding the particular contexts that the respondents are affiliated to within their institutions (Table 4), a rather encouraging number of 31.4% reported that their institutions have an accredited study programme in English and students have already enrolled in it (both students from Serbia and from abroad, i.e. international ones). Yet, a quite discouraging fact is that 43.0% stated that their institutions have no courses regularly offered in English whereas individual teachers may provide additional classes to international exchange students.

Context within institution	Respondents	
	%	No
has an accredited study programme in English and (local and international) students have already enrolled in it.	31.4	27
has an accredited study programme in English but neither students from Serbia nor from abroad students have enrolled in it yet.	11.6	10
offers particular courses in English, for both local and international degree and exchange students	16.3	14
has no courses regularly offered in English, but some teachers providing certain classes to international exchange students.	43.0	37
plans to have an accredited study programme in English.	23.3	20
has teachers who teach in English and are specially trained/rewarded for it.	4.7	4
has teachers who teach in English but are not specially trained/rewarded for it.	23.3	20

Table 4. Distribution of participants according to their teaching context

When asked about how often the respondents use English in the classroom or teach a course entirely in English the responses are rather disappointing (Table 5). Only 12.8% stated they use English often in their classrooms while 26.7% stated they use English occasionally. Regarding the question whether the respondents teach a course entirely in English, only 3.5% replied they do so often while 8.1% do so occasionally.

Frequency	Use of English in the classroom		Teaching a course in English	
	%	No	%	No
never	33.7	29	67.4	58
once	26.7	23	20.9	18
frequently	26.7	23	8.1	7
often	12.8	11	3.5	3
Total	100	86	100	86

Table 5. Frequency of use of English and teaching a course in English

The level of the respondents' confidence in their own English language competences is more or less reflected in the type of material they prepare for their students and how they use it in their teaching. For instance, 45.3% prepare some material in English, but most in Serbian as opposed to 16.3% who prepare some material in Serbian, but most in English. A total of 31.4% do not prepare any handouts while 20.0% use handouts for discussion questions (Table 6).

Preparation of handouts	Respondents	
	%	No
no handouts	31.4	27
outline of the lecture	51.2	44
discussion questions	20.9	18
lecture notes with gaps for the students to fill in	16.3	14

Table 6. Number of teachers who prepare handouts

As far as technology and additional aids are concerned (Table 7), a total of 84.9% use presentation slides while a moderate 17.4% use smartboards. These responses indicate that a large number of the respondents rely on fairly traditional teaching approaches and aids, thereby foregrounding the need for more pedagogical variety in their teaching, which could be achieved based on methods developed in ESP courses.

Technology/additional aids	Respondents	
	%	No
presentation slides	84.9	73
printed handouts	27.9	24
smartboards	17.4	15
video	36.0	31
internet (e.g., online learning platforms)	54.7	47

Table 7. Number of teachers who use some technology/additional teaching aids

Quite similar and more or less correlating with the previous responses is the fact that the respondents agree that it is challenging to a certain degree to speak in English (43.1%), prepare activities for the students (31.3%), assess student performance (30.2%), provide feedback (29.1%), organise interactive tasks (33.7%) and manage the classroom in English (27.9%). On average, only 6.9% stated that none of the above is challenging at all whereas 19.7% stated that all of the above were quite challenging. The collected responses lead to the conclusion that the respondents need instruction to develop their oral skills, in par-

ticular those skills that will help them communicate with their students directly and perform tasks other than just delivering a lecture. In other words, when it comes to performing their job, i.e., teaching content they can prepare in advance and rehearse, their confidence in their own competences seems satisfactory. However, when confronted with spontaneous situations in the classroom, they show certain concerns about the level of their English speaking skills. Similarly realistic estimations could be identified among the respondents regarding problems and concerns about teaching in English. Namely, 69.8% think it will take more time to prepare lessons than before and 45.3% think that developing good interaction with foreign students may be a problem. In addition, a total of 73.3% of the respondents did not think that the fact that students have mixed English language abilities is a concern. Also, 54.7% believe that the students' inadequate skills to use language in general may be problematic in classes based on EMI.

A final portion of our questionnaire was devoted to the respondents' use of English for academic writing purposes. As expected, all of our respondents (100.0%) use English for writing scientific/academic articles, more than a third of them (29.1%) for writing theses/dissertations and half of them (50.0%) for writing project proposals. As far as other types of academic texts are concerned, our respondents reported a more or less moderate use of English for lecture notes/slides (24.4%), laboratory reports (12.8%), popular science articles (10.5%), case studies (8.1%) and fieldwork notes (4.7%). When assessing their weak and strong points related to their own academic writing skills in English, the respondents opted mainly for a satisfactory level when assessing their knowledge of general English vocabulary (53.4%), their use of general academic phrases (50.0%), their ability to include linkers and comment phrases (50.0%), their use of sentence and phrase structure (55.8%) as well as their ability to use simple grammar (37.2%). Unlike that, 38.3% state that their knowledge of discipline-specific terminology is strong and so do 52.3% of them believe about the structure and form of their academic papers. Finally, a majority of them (66.3) write in English with the help of dictionaries and other resources, a total of 26.7% write their articles in English with the help of dictionaries and other resources and have them checked by an English professional. Somewhat encouraging is that only 7.0% first write their articles in Serbian and then translate them into English with the help of dictionaries and other resources while none of them write their articles in Serbian and have them then translated by an English professional.

The conducted needs analysis points to two main conclusions. The first is that, based on their responses, it can be concluded that university teachers in the fields of natural sciences and mathematics in Serbia have a realistic opinion of their own knowledge of English and their English language skills. At the

same time, they feel they are quite able to deliver a prepared lecture in English. However, the second conclusion indicates that university teachers in natural sciences and mathematics in Serbia lack more confidence when speaking in English in a more spontaneous context, including interaction with their students in class, e.g., initiating discussions regarding topics that are part of their teaching but not part of a prepared presentation. In addition, the results of our needs analysis indicate that university teachers in natural sciences in Serbia could benefit from pedagogical training in ESP methodologies which would help them feel more confident in an EMI context. As far as our respondents' academic writing skills are concerned, we can conclude that they show a certain level of confidence which is a result of their personal sense of self-assurance expressed with regard to their reading skills. In conclusion, we believe that our tailor-made *TAWE* course will be able to address all the weak points detected in our needs analysis while offering an additional boost of the strong points our respondents reported.

Course description

In accordance with the TeComp project requirements, the *TAWE* course for university teachers of natural and mathematical sciences is expected to develop to two different, but interrelated types of competences – university teaching in an EMI environment and discipline-specific academic writing in English. What is common for both types of skills and competences is the English language employed to carry out both teaching and writing activities. Therefore, it is necessary for university teachers to identify, be aware of and become proficient in the specificities of the English language as well as its use in cases relevant for these tasks. The components of the *TAWE* course (Figure 2) include EMI topics, academic writing and focus on English, appropriate in genre, style and medium.

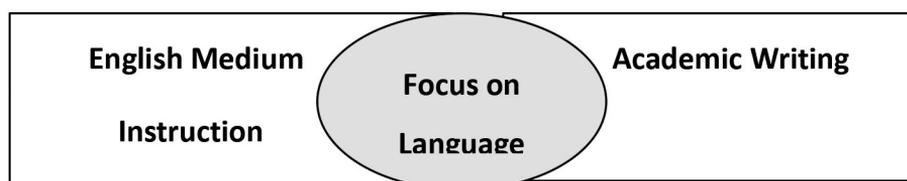


Figure 2. Components of the course content

In particular, the theoretical aspects of EMI, academic writing and vocabulary study are kept to a minimum, while the course participants are invited and encouraged to reflect upon, discuss and do many practical activities relating general principles to their academic and professional setting. The course is not intended to give standardized, general solutions, but to provide guidelines

and stimulate self-reflection. This could, hopefully, lead to individual solutions which are most suitable for various particular contexts, depending on institutional policies, local academic contexts, scientific disciplines, as well as the individual characteristics and preferences of the teacher.

A short outline of the syllabus is given in Table 8, which specifies the topics covered. It should be stressed that class interaction is very important, as it is based on a lot of small-group activities and group and plenary discussions. Both discipline-specific and even personalization is enabled through small-group and individual tasks. The course promotes self-reflection and self-assessment related to the participants' teaching and academic writing practices, language skills, communication and professional contexts.

Illustrative videos as well as segments of academic articles from open-access reliable sources are often used, accompanied by guided questions, which promote noticing, reflection, teaching strategies and language study. Special attention is devoted to genre and language differences between spoken and written language, i.e., between EMI teaching and writing academic articles in English. Illustrative videos and academic articles are carefully chosen to demonstrate the style differences among natural sciences and mathematical sciences, and for discipline-specific approaches. In the final practice sessions, which are at the same time performance assessment sessions, participants are expected to complete two tasks. One is related to academic writing, where they are expected to produce an article abstract while the other is a microteaching session in English, where they teach the content, which they normally teach in their courses, but in a shorter abbreviated microtask. For both performance tasks, there are two types of feedback and assessment – anonymous peer evaluation based on evaluation sheets, and instructors' feedback in the form of an individualized private evaluation.

Session	Topic
1.	English as Medium of Instruction (EMI): <ul style="list-style-type: none"> • Notion and characteristics of EMI • Aspects of EMI (teachers, students, content, language skills, limitations, motivations, characteristics, similarities and differences compared to teaching/learning in Serbian) • Teaching resources and support for the EMI educational environment
2.	Introduction to academic writing <ul style="list-style-type: none"> • Defining types of texts in academic writing (essay, laboratory report, case study, research, article, etc.) • Functional organization of three specific text types in academic writing (essay, research paper, project report) • Signposting and metadiscourse (vocabulary, phrases, coherence, cohesion)
3.	Differences between spoken and written academic language Adapting an academic paper into a lecture mode (a sample) Language devices for moving one genre into another
4.	Focus on language: functional language vs. content language <ul style="list-style-type: none"> • Vocabulary structure (types of vocabulary – general/academic/technical; frequency lists; academic wordlists – use and misconceptions) • Formulaic language for class language, class management, class organization • Speaking, communication and interaction • Cohesion and coherence • Functional language: notion and classroom examples • Content language: general and subject-specific • Issues and responsibilities: what if students may not know content words in English? • Connecting functional and content language in EMI environment
5.	Teaching in academia: class management and class interaction <ul style="list-style-type: none"> • Styles of lecturing and types of lecturers • Interacting with students • Specific academic culture vs. intercultural academic behaviour in an EMI class
6.	Academic writing: practical elements <ul style="list-style-type: none"> • Typical text types in natural sciences and mathematics: laboratory reports, project proposals, fieldwork notes, research articles, essays, theses/dissertations • Tips for writing reports on scientific experiments • Focus on writing abstracts and discussions in research papers: ready-made phrases/sentences, outline, structure, order/sequence of points, etc.
7.	Testing academic writing in practice
8.	Testing EMI in practice

Table 8. Abbreviated syllabus of the TAWÉ course

Concluding remarks

The design of the specialized *TAWE* course is firmly based on the theoretical postulates and practical guidelines of both ESP and EMI research combined with the empirical needs analysis of potential course participants. In particular, it exhibits both the absolute and variable characteristics of ESP, outlined by Dudley-Evans and Dudley-Evans and St. John.

The course is defined to meet the specific requirements of HEIs in the field of natural and mathematical sciences in their attempt to improve the conditions for internationalization of teaching and research, by raising English language and teaching competences of their teaching and research staff. Fact is that many HEIs in Serbia are devoted to the process of internationalization. The respondents in our needs analysis confirmed that some of their institutions have an accredited study programme in English. In addition, a significant number of respondents reported that internationalization is a reason why they want to attend an EMI course. Some of them even have some experience in using material in English, or even teaching part of their courses in English. Nevertheless, a large number of our respondents' answers indicate that they lack experience in working with international students, not because they have insufficient English language skills, but because they lack teaching skills to teach their subject-specific content in English, which is exactly what a tailor-made course could offer.

That is why the *TAWE* course is defined and, following the needs analysis, finely tuned to meet the specific needs of junior and senior teaching staff at faculties of natural and mathematical sciences in Serbia. Next, even though the *TAWE* course does not completely use the methodology and activities of natural and mathematical sciences, it does make ample references to such methodology and activities. The final among the absolute characteristic is that *TAWE* has a strong focus on the language segment, highly appropriate for teaching and academic writing in English in natural and mathematical sciences.

Variable characteristics are also evident, since *TAWE* is clearly designed for several specific disciplines, although taken rather broadly, without going into details of particular natural sciences such as biology, chemistry, etc. and subdisciplines, such as biochemistry, ecology, theoretical physics. However, the genre distinctions between mathematical and natural sciences in academic writing are not ignored. *TAWE* is clearly designed for highly educated adult learners, experts in their fields, with an upper-intermediate and even advanced command of English, who are rather proficient in reading their professional literature in English. It is supposed to address their needs by providing insights, practice and reflection related to teaching their content courses in English, whereby they should make use of all the resources at their disposal (language, pedagogy, technology, intercultural awareness, etc.) to convey their meaning in class, in various types of EMI environments depending on their local contexts. Moreo-

ver, it addresses their needs related to academic writing, in particular research articles in English.

Finally, it should be stated that at the time when this article is written, the initial implementation of the course is still pending. Therefore, this article is focusing on the design of the course only. Upon its implementation and completion, an additional assessment and evaluation will follow.

WORKS CITED

- Alastrué, Ramón Plo, and Carmen Pérez-Llantada (Eds.). *English as a Scientific and Research Language*. Berlin: De Gruyter Mouton, 2015. Print.
- Anthony, Laurence. *Introducing English for Specific Purposes*. London: Routledge, 2018. Print.
- Basturkmen, Helen, and Catherine Elder. "The Practice of LSP". *The Handbook of Applied Linguistics*. Eds. Alan Davies and Catherine Elder. Oxford: Blackwell, 2004. 672-694. Print.
- Dearden, Julie. *English as a Medium of Instruction: A Growing Global Phenomenon*. London: British Council. 2015.
https://www.britishcouncil.es/sites/default/files/british_council_english_as_a_medium_of_instruction.pdf
- Dimova, Slobodanka, Anna Kristina, Hultgren and Christian Jensen (Eds.). *English-Medium Instruction in European Higher Education*. Berlin: Mouton, 2015. Print.
- Dudley-Evans, Tony. "An Overview of ESP in the 1990s". *The Japan Conference on English for Specific Purposes Proceedings*, Aizuwakamatsu City, Fukushima, 1998. 5–11.
<https://eric.ed.gov/?id=ED424775>
- Dudley-Evans, Tony and Maggie-Jo St. John. *Developments in English for Specific Purposes: A Multi-Disciplinary Approach*. Cambridge: Cambridge University Press, 1998. Print.
- Macaro, Ernesto. *English Medium Instruction: Language and Content in Policy and Practice*. Oxford: Oxford University Press, 2018. Print.
- Macaro, Ernesto. "Exploring the Role of Language in English Medium Instruction". *International Journal of Bilingual Education and Bilingualism*, 23:3, (2020): 263-276. <https://doi.org/10.1080/13670050.2019.1620678>
- Mišić-Ilić, Biljana. "Nastava jezika struke kao sinergija znanja jezika i struke – jedan primer iz nastavne prakse." [Language for Specific Purposes as Synergy of Language and Expert Knowledge: An ESP Example] *Teme* 35.3 (2011): 875-887. <http://teme2.junis.ni.ac.rs/public/journals/1/previousissues/teme3-2011/teme3-2011.htm>
- Mišić Ilić, Biljana, Jasmina Đorđević, and Nikola Tatar. *Teaching and Academic Writing in English (TAWÉ) course*. Niš: Project TeComp. 2021.
- Paltridge, Brian, and Sue Starfield (Eds.). *The Handbook of English for Specific Purposes*. London: Blackwell, 2013. Print.
- Šorgić, Ivana, and Jasmina Đorđević. "Stavovi studenata stranih filologija na Filozofskom fakultetu u Nišu: budući nastavnici stranog jezika o potrebama učenika stranog jezika [Foreign Philology Students' Attitudes at the Faculty of Philosophy in Niš: Future foreign Language Teachers about the Needs of Foreign Language Learners]." *Strani jezici na društveno-humanističkim departmanima Filozofskog*

fakulteta u Nišu: retrospektiva u čast jubileja. Eds. Jasmina Đorđević and Vesna Simović. Niš: Filozofski fakultet u Nišu, 2021. 137–153. <https://doi.org/10.46630/sjr.2021>

Tuomainen, Satu. "Supporting Non-Native University Lecturers with English-Medium Instruction". *Journal of Applied Research in Higher Education* 10.3 (2018): 230-242. Print. <https://doi.org/10.1108/JARHE-03-2017-0022>

ENGLISKI JEZIK NAUKE I STRUKE I INTERNACIONALIZACIJA VISOKOG OBRAZOVANJA I NAUČNIH ISTRAŽIVANJA

Sve veća internacionalizacija visokog obrazovanja, naučnih istraživanja i naučnih izdanja, u kojima je dominantna upotreba engleskog jezika, podstakla je potrebu za krajnje specijalizovanim i namenski osmišljenim kursevima engleskog jezika nauke i struke (engl. *English for Specific Purposes – ESP*) za univerzitetsko osoblje i istraživače. Širenjem koncepta engleskog jezika kao jezika nastave (engl. *English as Medium of Instruction – EMI*) univerzitetskom nastavnom osoblju postavlja se novi zahtev da usvoji ne samo opšti engleski jezik i *ESP*, već i pedagoške i interkulturalne komunikativne kompetencije. *ESP* za pojedine naučne i tehničke discipline, kao i engleski jezik za akademske potrebe (engl. *English for Academic Purposes – EAP*) i nastavu akademskog pisanja, već su u upotrebi i imaju solidnu tradiciju u ne-anglofonim akademskim ustanovama. Stoga, *ESP*, u širem smislu, odnosno, pristup nastavi jezika koji za cilj ima akademske i profesionalne potrebe učenika i fokusira se na potreban jezik, žanr i veštine kako bi se te potrebe zadovoljile, sada može da se nosi sa novim izazovom i kombinuje *EMI*, *ESP* sa posebnom terminologijom u određenim disciplinama i *EAP*. Rad predstavlja specijalizovani kurs osmišljen za potrebe razvijanja kompetencija za nastavu na engleskom jeziku i akademsko pisanje. Kurs je deo Erasmus+ projekta *Jačanje nastavnih kompetencija u prirodnim i matematičkim naukama* (engl. *Strengthening Teaching Competencies in Natural and Mathematical Sciences*) (*TeComp*). U empirijskom delu, predstavljeni su rezultati analize potreba sprovedene među budućim polaznicima kursa (univerzitetski nastavnici i mladi istraživači u polju prirodnih i matematičkih nauka) na sedam univerziteta u Srbiji, koji su učesnici u projektu *TeComp*. Predloženi kurs zasnovan na teorijskim principima *ESP* (Dudley-Evans, Anthony) i *EMI* (Macaro), kao i na sprovedenoj analizi potreba, kombinuje suštinske elemente *EMI* i akademskog pisanja, u odnosu na određenu naučnu disciplinu i učenike.

Ključne reči: internacionalizacija visokog obrazovanja, engleski jezik kao jezik nastave (*EMI*), engleski jezik nauke i struke (*ESP*), nastava akademskog pisanja, *ESP* za prirodne i matematičke nauke.