

Some Aspects of Online Teaching of Technical English

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Abstract—The "new reality" imposed by the COVID-19 pandemics in 2020 affected the human society in innumerable ways. One of the issues that has gone through radical changes is surely the higher education system, with the teaching process migrating from classrooms into the virtual reality of online courses and classrooms. The topic of the paper is the teaching of Technical English in online environment, in terms of the course and process planning, organization, design, implementation, and gained experiences and results. The courses created for the subjects English Language 1, 2, 3, and 4 at the Faculty of Electrical Engineering, University of East Sarajevo, as well as the entire online ESP teaching process based on these courses, will be used as a basis for the paper. Within that, the role of tools used for the course creation and implementation, both specific (Moodle, Jitsi Meet) and general (email, social networks, Word, PowerPoint, YouTube, Google Drive, and VSDC Free Screen Recorder) will be presented as well. At the end of the paper, conclusions will be made on the basis of the practical experiences and results achieved during and after the implementation of the courses.

Keywords – ESP; Technical English; online teaching; Moodle; Jitsi Meet; multimedia; course creation; course design

I. INTRODUCTION

In the definition given by Bawarshi and Reiff, it is stated that the primary characteristic of English For Special Purposes (ESP) is the focus "on studying and teaching specialized varieties of English, most often to non-native speakers of English, in advanced academic and professional settings [1]. A similar statement can be found in the in the description of ESP given by Paltridge and Starfield in which they notice that it "refers to the teaching and learning of English as a second or foreign language where the goal of the learners is to use English in a particular domain" [2]. Finally, Krzanowski and Day create the definition of ESP by using words from its name as a basis for the definition, saying that it "involves teaching and learning the specific skills and language needed by particular learners for a particular purpose", so that "the P in ESP is always a professional purpose – a set of skills that learners currently need in their work or will need in their professional careers" [3].

Within the teaching of English for Special Purposes at the university level, Technical English has a significant part and

role, covering the specific aspects and features of the English language used for professional and vocational information exchange in different technical sciences. Due to the fact that such language is closely related with modern and new technologies, inventions and discoveries and thus a live and constantly changing matter upgraded with new words, compounds, phrases and abbreviations, in performing the Technical English classroom teaching process it is necessary to set clear and precise goals, which can be implemented within the time allocated for the lessons per week or, in total, per semester. At the same time, it is also necessary to spare some teaching (classroom) time for the harmonization of students' knowledge in General English gained during the primary and secondary education, especially in the field of grammar (morphology and basic syntax) and general vocabulary.

To expand the amount of information presented to students and the opportunities for their controlled and guided extracurricular activities, and generally to overcome the problems and limitations caused by the (mostly) insufficient classroom teaching time stipulated by the curriculum, online activities and courses often present a valuable solutions, especially with regards to the fact that personal computers, laptops, tablets and smartphones, together with the fast and cheap or free Internet connection, are commonly available to students of technical faculties and, furthermore, present an inseparable part of their educational, professional and every day life and reality. The author's previous experience in the creation of online courses in Technical English, primarily when they are used as an extracurricular tool, is described in the papers [4], [5], [6], [7] and [8].

However, the COVID-19 pandemics which emerged in 2020 affected the global human society and all the aspects of life in innumerable ways, and one of the issues that has gone through radical changes has surely been the higher education system, with the imposed need to migrate the teaching process from physical and direct work with students in classrooms into the virtual reality of online courses and classrooms. That migration had to be performed very fast in order for the teaching process to be continued and kept alive, so that the academic year could be finished in a satisfactory manner and students prepared and with enough knowledge and information to be prepared to study for and take their exams. However, observed on a larger level and due to the emerging global

needs and trends related to the online teaching and learnings, the designed and created courses should be prepared as a complete solution which will exist, last and be used as an appropriate alternative to traditional classroom courses, outside the COVID-19 pandemic context.

Some authors have already observed various aspects of teaching English Language online due to the COVID-19 pandemic [9], [10].

In the specific case of the teaching of Technical English in online environment, which is relevant to the paper, a set of actions in terms of the online course organization and the planning of the course creation process had had to be performed, before the courses were designed and implemented. The mitigating circumstance in doing that has been the fact that a language as a teaching subject in general is something that could be easily, logically and bidirectionally expressed, presented and distributed in the form of audio-visual and online materials containing written and spoken text.

II. COURSE ORGANISATION AND PLANNING

Before writing about the online courses, it is necessary to give the key information on the subjects making the Technical English course which is taught at the Faculty of Electrical Engineering, University of East Sarajevo, and for which the online courses have been created. Namely, the course is taught in the first two years of undergraduate study (first four semesters) at all three departments (Electric Power Engineering, Automation and Electronics, and Computer Science and Informatics) and organized into four one-semester subjects (English Language 1, 2, 3 and 4). There are two lessons per week (2x45 minutes) in all four semesters, and, considering that a semester lasts for 15 weeks, it makes a total of 120 lessons in the two years. English Language 1 covers some of general, primarily electrical engineering and ICT related topics in Technical English, English Language 2 is dedicated to English in ICT, English Language 3 deals with the origins and historical development of different electrical engineering and ICT devices, concepts and systems, while English Language 4 includes the lessons on contemporary technologies related to different branches of electrical engineering and ICT. Within the courses in English Language 1 and 2, the key points of English grammar (morphology and basic syntax) are taught as well. There has been a total of 74 first year students to be attending the online courses in English Language 1 and 2, while there have been 56 second year students to be attending the online courses in English Language 3 and 4.

The initial idea and goals regarding the course creation and planning have been to create gradually a system of courses for all four subjects (English Language 1, 2, 3, and 4) with individual courses for each of them, in such a way that the courses would first be created for the subjects taught in the summer semester (which was in progress in that time), i.e. English Language 2 and 4, and then for the remaining two, English Language 1 and 3, taught in the winter semester. The overall concept of an online course has been envisaged as an online platform, or, better to say, an organized set of online tools, which provides the opportunity of direct, live

communication with students in real time, but also makes it possible for them to access and/or download the course materials (including the recorded videos of lectures and PowerPoint presentations with the recorded narration) and complete and submit written assignments. In other words, the courses have been meant to provide a combination of real time online interaction with students and of activities to be performed and completed in a time which individual students find as the most appropriate, still remaining completely standalone and packed with all the necessary teaching materials, considering the (worst possible) case in which the teacher or student(s) are unable to present/attend the lessons in real time due to inaccessibility or health or technical issues.

Due to the fact that online taking of exams at state universities has not been regulated and permitted by the current legislation in Bosnia and Herzegovina, so that all the exams have to be taken in the classrooms within the faculty/university premises and with the attendance of both the teacher and the students, the designed courses have not contained any (truly) grading and assessment mechanisms and systems besides the records on attendance and completion and evaluation of given assignments.

The “easier” part of the course, dealing with the direct, real time interaction with students has been planned to simulate the spoken part of the classroom work (primarily lectures, grammar and speaking exercises) by means of a video conferencing tool, as much as it is possible in the virtual environment. On the other hand, the part of the course containing the course materials has required much more thinking and planning, as well as numerous preparatory actions preceding the creation of course units. These actions will be described in more detail in the next section, which deals with the course design and implementation.

III. COURSE DESIGN AND IMPLEMENTATION TOOLS

In terms of the software, the two foundations of the courses have been the tools generally adopted and implemented by the Faculty of Electrical Engineering in East Sarajevo: Jitsi Meet as a free video conferencing tool for creating virtual classrooms in real time and Moodle as a free comprehensive learning management system providing the complete solution for the course creation. However, particularly in terms of information exchange and course material design, creation and distribution, some other, more-less general services and software have also been used, such as email, social networks, YouTube, Google Drive, Word, PowerPoint, and VSDC Free Screen Recorder.

A. Jitsi Meet

Jitsi Meet presents an open source video conferencing solution which can be used for free without the need for opening an account. If it is used on Windows PCs or laptops, it is enough to open a web browser, go to <https://meet.jit.si/> and create a video conferencing (class)room by giving it a unique name, and then simply distribute its address (in the form <https://meet.jit.si/uniqueusername>) to the desired participants (students) who can then access the room in the same way i.e. through a web browser. In the case of Android devices, there is an application available for download on the Play Store which

should be installed on a device, and then course creation and access are performed in it, in the manner similar to the previously described one. Besides the elementary video conferencing features (chatting with webcam and microphone on or off), Jitsi Meet also enables the sharing of a desktop, presentations, application windows, folder contents etc. It also enables the exchange of messages and emojis during an online lesson, by means of its integrated chat feature. Within its settings it also provides many options useful for real time online courses, such as the video recording (to use that, it is necessary to have a Dropbox account, because the video is recorded there), live stream, sharing of a video to YouTube and details on every individual course participant (Speaker stats) [11]. It mostly runs smoothly on different connection types and speeds, without major interruptions and with acceptable sound delay.

B. Moodle

Moodle stands for *Modular Object-Oriented Dynamic Learning Environment*. It was founded and developed by Martin Dougiamas in 2002, and designed to provide educators, administrators, and learners with an open, robust, secure, and free platform to create and deliver personalized learning environments. Moodle is a user-friendly Learning Management System (LMS) that supports learning and training needs for a wide range of institutions and organizations across the globe, being the most widely used LMS in the world, with well over 100,000 registered implementations worldwide supporting over 150 million learners. Its modular nature and inherent flexibility make it an ideal platform for both academic and enterprise level applications of any size [12]. In the author's previous paper [13], different aspect and uses of Moodle in the context of ESP teaching have been discussed.

In the case of the creation and design of actual online courses in topic, and due to the requirements of Moodle as a system, it has been very important that the Faculty of Electrical Engineering in East Sarajevo has Moodle installed and set on its own server (<https://moodle.etf.ues.rs.ba/>), with all the students registered on it, so that, to design and, later, develop, run and implement a course, it was only necessary for the administrators to create it and give the Technical English teacher the appropriate course administration privileges. After that was done, all subsequent course design actions have become the responsibility of the teacher, implying a great deal of planning and various preparatory actions preceding the creation of individual course units.

C. General Services and Software

To inform the students about the course creation, details and login procedure, email and social networks (primarily Facebook, by means of the previously created closed groups for students of every year) have been used.

Microsoft Word has served as a tool for making the digitalized copies of the course content (lessons and exercises), while PowerPoint has been used for the creation of grammar presentations with recorded narration.

The role of VSDC Free Screen Recorder has been to make the lesson presentation videos, by recording simultaneously the

narration and the text of a lesson seen in a Microsoft Word window. Such videos would later be uploaded and published on YouTube, on the teacher's dedicated channel and linked into appropriate course unit in Moodle. YouTube has also been the source of video materials on different topics relevant to the lessons to be discussed in spoken or written form.

Finally, Google Drive, i.e. the teacher's dedicated online storage space, has been used for the uploading of additional course materials in different text, image, audio and video formats and the sharing of such materials within Moodle course units.

IV. COURSE DESIGN AND IMPLEMENTATION

General idea of an online course design is to make an online version of a "live" course, containing all the materials and components a Technical English course should consist of, including both the classroom work (lesson and grammar presentations, speaking and grammar exercises), and guided extracurricular activities: reading comprehension, speaking and writing (related to the appropriate professional and vocational textual and audiovisual materials), and, in the first two courses (English Language 1 and 2), an overview of grammar.

As it has already been said, the real time part of an online course has been performed by means of Jitsi Meet platform, by creating "rooms" for video conferencing (online lessons) to which students connect in the given time, so that regular, full time online lessons can be performed. It includes the presentation of teaching materials and oral exchange of information with students, as well as speaking exercises and short discussions. Due to the server load, connection quality, picture and sound quality, reducing of image and sound delays, as well as the differences in the quality of the Internet among the students attending an online lesson, a common practice has been that one person speaks at a time. Online lessons have taken place on a weekly basis, in terms that correspond to the "regular" weekly schedule and dynamics of classes. For practical reasons and depending on the number of attendees, the students have been divided into two or three groups.

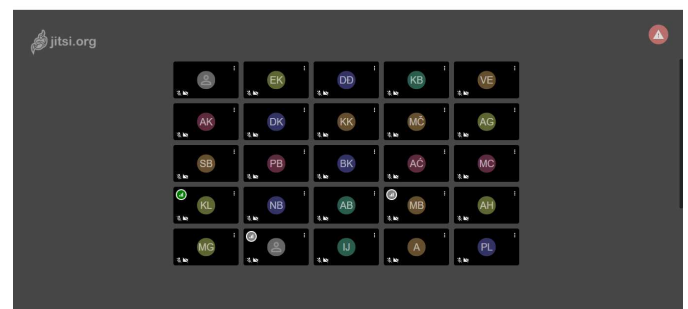


Figure 1. Jitsi Meet online lesson window

On the other hand, in dealing with the static, permanent and standalone part of a course, the essence of the design process have been the course units, which follow the syllabus and the teaching materials planned to be presented and exercised within a week, so that every new week during a semester a new unit has been made, creating, at its end, a complete course with fifteen units consisting of all necessary materials and content.

To create and design a course unit, there are numerous actions which have to be performed. As it has been previously stated, some of them precede the course unit creation and design. Such actions are:

- digitization and adaptation of basic textual content (lessons) and their preparation in docx format (usually performed by text typing or with the assistance of OCR software);
- digitization of lesson exercises, also in docx format and
- making (recording) of lesson presentation videos in VSDC Free Screen Recorder and their upload to YouTube.

In cases when, within the teaching units, certain grammatical areas are covered (as in the courses for English Language 1 and 2), there are two more preparatory actions:

- creation of a PowerPoint presentation for a specific grammatical area and
- recording the narration related to the grammatical area in the background of slides from the presentation.

After the preparatory actions have been performed, what comes next is the creation of individual teaching units, which, together, make the design of the entire course. As it has already been said, the course teaching units correspond to the units envisaged for classroom and extracurricular work on a weekly basis. One teaching unit contains several types of elements. First of all, there are texts and related exercises prepared in docx format, ready to be downloaded. The next element, essential for the course interactivity and the students' work monitoring, guidance, evaluation, and assessment, are the activities, that is the tests given in the form of Moodle quizzes. They correspond to exercises related to texts, but, in the case that a grammatical unit is processed within the class, appropriate grammar tests also occur. Finally, there are the translation tests and essay assignments, related to the lesson topic(s). Tests consist of tasks based on three different types of questions which are provided in Moodle (Essay, Matching, Embedded answers (Cloze)). Tasks that are done as Essay questions imply the answers in the form of open questions (answers in the form of sentences or paragraph text, descriptions of terms, harmonization of terms and their definitions, translations, essays...) so as not to give students the opportunity to check the accuracy and correctness of their answers after taking a test, but it is necessary to review each of the answers and provide students with feedback on the quality and accuracy of what has been done. On the other hand, tasks such as Matching and Embedded answers (Cloze) provide students with the opportunity to check the accuracy and correctness of their answers after taking a test. As such, they are particularly useful for fill-in and matching exercises, as well as for grammar practice.

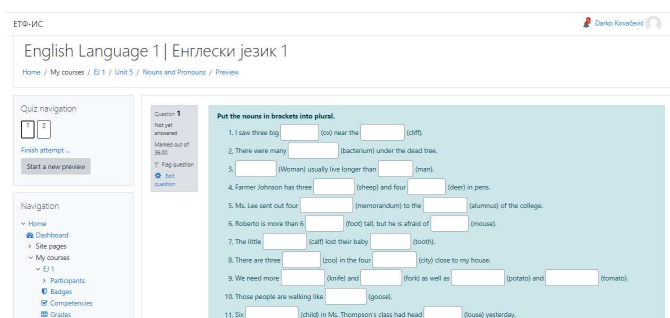


Figure 2. Example of a fill-in grammar exercise created in Moodle

For students, completing of the tests is compulsory and is treated both as the classroom activity and integral part of their attendance. All entered answers are recorded in Moodle and represent a precise insight into the “digital” presence of students in a particular course, as well as into their practical work, engagement and understanding of the presented content.

An integral part of the teaching units are recorded video lectures related to the textual content of lessons, which are posted on a YouTube channel and linked to the appropriate teaching units on Moodle, as well as, where necessary, PowerPoint presentations of grammar units (with the narration which follows the slide content) which are posted directly within a unit on Moodle and can be downloaded. In the same way, additional files to be downloaded are posted within units, either directly or, in the case of larger files, linked from Google Drive, where they have been uploaded prior to sharing.

Finally, some teaching units contain the links to YouTube videos, to be discussed and elaborated by students, orally or in the form of an essay (by means of a quiz containing one or more Essay questions).

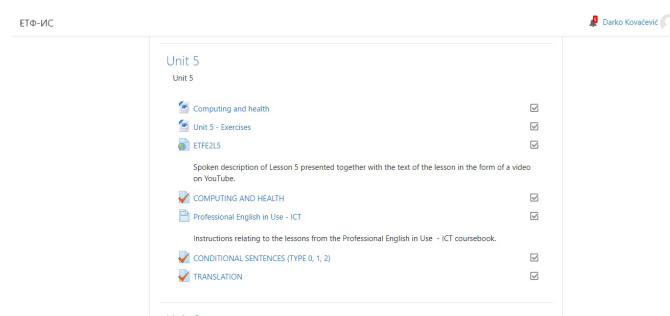


Figure 3. Contents of a teaching unit created in Moodle

All the mentioned elements together make comprehensive and standalone teaching units practically not depending on the teacher's live presence, which, together, participate in the design of an individual course which, with regards to the specific subject, represents the classroom work and teaching and learning activities in virtual world in the best possible way.

Students are promptly informed on the creation of new course units and adding of new elements to individual units by means of the mentioned information channels (email, Facebook groups), which usually happens once in a week. There are no time limits and restrictions in terms of completing the quizzes

and other assignments, but the students are expected to have everything completed and submitted by the end of a semester, i.e. by the time a course is completed. Moodle provides detailed statistical information on that, both for the entire groups and for individual students.

V. CONCLUSIONS

In all of their aspects, both general and specific, foreign language teaching and acquisition are the processes in which the best results are achieved in a direct and live contact and information exchange within a classroom. However, the series of events from the spring of 2020 which occurred as a consequence of the COVID-19 pandemics has demonstrated that it is possible for the entire world to freeze, for the people to stay isolated in their homes for weeks and for the Internet to become the only available media for making social contacts, doing work and, what is of particular importance for the participants at all three levels of educational process, to get education in a continuous process, and, among numerous other teaching fields, that can be fully applied to the teaching of Technical English at the university level as well.

Observed in that way, but also in a more global and general manner, the online courses in Technical English which have been presented and described in the previous text, of course together with the online courses in all other subjects taught at the Faculty of Electrical Engineering in East Sarajevo, have had and are still having an extremely significant role in terms of the preservation of the teaching process continuity. The overall availability and the logic of their use, as well as the course content itself, make it possible for most students to acquire an appropriate amount of knowledge in all relevant Technical English teaching components, and that has been initially confirmed by both by the results of the examinations they had (live, in their classrooms) after the teaching process performed through courses had been completed and the results of the semester survey that is performed among the students every semester. In the period that follows, together with the normalization of the teaching process, more precise information could be given about the quality of the performed online teaching process, through the comparison of the results, achievements and impressions of the students who had the Technical English lessons online with the results of students who studied in regular classroom environment, and that will surely be an interesting topic for some future research. It is a fact that there is always some room for the improvement, but in the given circumstances the created online courses in Technical English have achieved their purpose.

The next step in the course development could be performed at the level of the entire University of East Sarajevo (which also uses Moodle as its LMS) by creating a unified system of university level ESP courses in different fields, based on specific courses taught within the organizational units of the University. The making of such a system would provide

numerous benefits to the teachers and students, and also to the entire University, especially in terms of the information, experience and course material exchange, and thus significantly improve the ESP teaching process at the level of the entire University.

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