TEACHING ESP TO STUDENTS IN MECHANICAL ENGINEERING VIA INTERACTIVE PLATFORMS

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Abstract: *Teaching English for Specific Purposes is a challenging endeavor, especially during a pandemic that forced a new teaching/learning paradigm. The present paper aims to highlight the online tools and platforms that have been useful in order to provide an efficient and enjoyable learning experience. Considering the learning styles of the students and the skills needed for future engineers to become competitive on the labor market, we have comprised a series of sample activities that may be considered examples of good practice.*

1. THEORETICAL FRAMEWORK

The origin of English for Specific Purposes dates back to the years after the Second World War, a flourishing time for international economic activities and major scientific and technological advances. The reality of those days generated the massive need for a shared language that could facilitate business and technological exchange. English has become a sort of international currency, learned for the practical and specific purposes beyond its beauty and fashionable trends. There was also the revolution in linguistics that heavily characterized the field of English for Specific Purposes, as the scholars' focus shifted from the formalist view on language to real and practical language opportunities and contexts. In the late 1960s and the early 1970s specialists like Ewer and Lahore, Swales, Selinker and Trimble made significant attempts to describe the new interpretation of English as English for Science and Technology (EST). Maybe the third and arguably the most influential reason Hutchinson and Waters [1] invoked for the emergence of ESP has to do with psychology. They stressed the importance of considering the learner at the centre of the learning process. Therefore, more emphasis was given to the ways in which learners acquire language than simply focusing on the method of

language delivery. Learners were seen to have different learning strategies, to use different skills and to be motivated by different needs and interests.

Ever since the early 1960s, English for Specific Purposes has been the subject of numerous studies and classifications, definitions and reinterpretations, Hutchinson and Waters comprising five phases of development for ESP [2]. They stressed out that the course design process should be more dynamic and interactive - a prophetic word to be taken to a completely different level during the pandemic of the 2020s.

Nevertheless, there are some features that have been preserved along the years, such as the idea that ESP is actually language in context and the learning process revolved around the needs of the learners. The courses require real life learning situations that enhance students' skills and help them become more competitive. The subject is currently taught in universities around the world and it is employed by multinationals in the shared goal to raise the level of proficiency in specialized English for a more profitable and innovative future.

Students that choose mechanical engineering at Bachelor's level are fascinated by this field and highly interested in their professional and personal evolution. Their age range is between 18 and 45 years and the level of English knowledge usually varies between A2 and C1 on the Common European Framework of Reference. [3] As Hess N points out [4] teaching students that have different backgrounds and performance in a foreign language may become challenging when it comes to keeping them focused. Some authors [5] asserted that the use of smart devices is a distractor for students in situations when their level of English is insufficient or above the average one employed by the professor, the major switch to technology and the advantages of interactive learning generated by the 2020 pandemic being impossible to foresee.

The age of students plays an important role in their learning process, as people of different ages have different needs, competences and cognitive skills. For students who continue their education to academic level right after graduating high school, the process of learning is not a major challenge. It becomes more complicated for those who have a gap in formal education. As Jeremy Harmer [6] noted, adult learners can exhibit some traits that can easily make learning and teaching problematic. They might be critical of teaching methods, sometimes reluctant to engage in role-playing activities, or scenarios that might put them in an uncomfortable position. Adult learners can feel anxious or under-confident about learning a language and sometimes worry about their intellectual capacities. All these factors were amplified by the sudden adjustment of the educational environment in the beginning of year 2020, the immediate need to use technology and smart devices revealing the rift between "the digital natives" and "the digital immigrants" [7].

One vital aspect of English for Specific Purposes throughout the process is its focus on the learning strategies rather than teaching techniques. Therefore, students' learning styles are crucial for their successful professional growth. The idea that students learn best when the teaching methods match their learning styles, strengths, and preferences grew in popularity over the years, Neil Fleming's VARK model [8] being one of the most prominent. VARK is an

acronym made from the initial letters of Visual, Aural, Read/Write and Kinesthetic and it deals with perceptual modes, which means that it is focused on the different ways that learners take in and give out or express information. In a nutshell, a visual learner prefers charts, graphs and hierarchies, as patterns, designs and color are important in establishing meaning for them. The aural learner prefers information that is spoken or heard and they learn best from asking questions, a discussion, oral feedback or presentations, and talking with others. R stands for Read/Write and the learner is into information displayed as words, either read or written. Many academics and high-achieving learners have a strong preference for this modality, as these learners place importance on precision in language and are keen to use quotes, texts, handouts and manuals. The kinesthetic learner prefers the use of experience and practice through many senses (sight, touch, taste and smell) to take in their environment and to learn new things. Different schemes or models of learning styles that have been proposed over the years [9], a relatively comprehensive review described 71 different schemes, without claiming that their list was exhaustive [10]. In our approach to teaching ESP to students in engineering, we have considered the basic learning styles as main pillars to facilitate the educational experience which was severely affected by the lack of direct interaction in person between the teacher and the student.

Working with basic users of English is challenging, as students' knowledge only allows them to understand sentences and frequently used expressions related to areas of most immediate relevance, to communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters, and to describe in simple terms aspects of their background, immediate environment and matters in areas of immediate need. [11]. While studying engineering is accessible and enriching, English specialized terminology and highly professional interaction may become a stumbling block in their evolution within a globalized world. At the other end of the spectrum there are the students who have a solid linguistic background, acquired in more than ten years of serious study of General English. They can understand a wide range of demanding, longer clauses, and recognize implicit meaning, can express ideas fluently and spontaneously without much obvious searching for expressions. Moreover, they can use language flexibly and effectively for social, academic and professional purposes while producing clear, well-structured, detailed text on complex subjects, showing controlled use of organizational patterns and connectors. [11]

Confronted with such heterogeneous groups of students in mechanical engineering, the teacher plays an essential part in this complex equation, as the essence of ESP goes beyond the limits of teaching itself. Tony Dudley-Evans and Maggie Jo St John support the idea that the term "practitioner" is to be used instead of "teacher" due to the complexity of the work incurred by this job. In their view, the ESP practitioner has to embody five roles, namely that of a teacher, course designer and materials provider, collaborator, researcher and evaluator [12]. Usually a graduate of Philology, the practitioner is above all a teacher, whose standard duty is to help students learn. Therefore, the methods employed are similar to those used when teaching

general English, with the major difference regarding the content of the ESP course. While the teacher is proficient in terms of English language, the students are invited to bring valuable contribution to the classes by conveying their knowledge in the field of engineering. After carrying out a needs analysis stemming from learners, fellow professors and the business environment, the ESP practitioner can identify the proper courses, textbooks and materials that best answer the needs of their students. It goes without saying that being a collaborator is one of the greatest accomplishments of a practitioner, the professional growth in multiple directions being both valuable and rewarding. As researchers, the ESP practitioners need to be updated with the advances in the field they are teaching and provide adequate and accurate information in the knowledge exchange with the students. The role of evaluators place the ESL practitioners in the position of assessing whether the aims of the learning process meet the end results, in other words "to assess whether students have the requisite language and skills to undertake a particular academic course or career" [12].

Robinson [13] argues that flexibility is a key value needed for one to switch from being a teacher of general English to a teacher of ESP in order to comply with peculiarities of different groups of learners and adapt to their professional needs. Harding [14], on the other hand, claims that an ESP practitioner can make use of some general English teacher skills when planning the lessons, while stressing some professional differences. In other words, the ESP practitioners should think about what is needed by their students and avoid using random off the shelf course books. They should understand the nature of their students' subject area and work out their language needs in relation to their specialism. The ESL practitioner should use authentic materials within contexts, texts and situations in the field of study of their students while motivating them with varied and relevant activities.

2. TOOLS AND PLATFORMS

In their four semesters of ESP classes, students in mechanical engineering have been exposed to educational activities gradually, prioritizing the receptive skills in the beginning and finishing the practical course with the most demanding of the productive skills, namely writing. Our standard approach usually began from a written text containing both specialized vocabulary and basic grammatical landmarks, that essentially described a familiar process or some common knowledge for the students. They were expected to read the text out loud, to translate it using proper resources such as specialized dictionaries, to discuss and further explain the concepts interacting with the teacher or with each other and eventually to write a composition on the given topic. The pandemic forced the learning process in the online environment in a short period of time, the classroom setting being replaced by innovative and sometimes fragile remote interaction, so the need to adapt to the new educational reality was imperative.

The first essential step to preserve the contact between teacher and students in times of lockdown and physical distancing was identifying the most convenient platform for online communication. In chronological order, we chose to interact online with the students via Skype, KnowledgeBase and Zoom.

Skype is a popular web-based communication tool that allows people to take part in video conferences, make calls, send instant messages and a lot more. It was created by Janus Friis from Denmark and Niklas Zennstrom from Sweden in 2003 and it is a free software. It was the first appealing option, as most of us had already been using this free app for years and knew how it operated. Skype is very easy to set up and use, options like video-calling and chat being very accessible and useful for the virtual interaction. When teaching online, the chat feature can serve as a raise your hand method or as a whiteboard that allows participants to share notes or resources. A particularly useful characteristic of the chat feature is the opportunity to maintain contact with students beyond the standard program, so that potential queries or difficulties could be addressed individually and with great flexibility. The most important characteristic we have used is the screen sharing, which instantly makes materials available to the class and the lessons become more dynamic. Students can also share their screen, so their work may be visible and the feedback can be provided almost instantly. Files and assignments can also be sent back and forth between teacher and students during video calls. Skype facilitates listening, speaking and grammar-oriented lessons, all derived mainly from PowerPoint presentations. [15] One option is to use videos and podcasts that the student listens to during class and is afterwards required to answer some questions meant to check their comprehension. Speaking lessons can be taught by recording students reading, taking part in a role-play activity, repeating after the teacher, and then playing the recording back to them. Skype has a subtitle feature that can be enabled, so that the student can visually see the teacher's words and repeat them slowly. Grammar lessons can be also taught via Skype by using PowerPoints and screen sharing, or by sending short readings or exercises for the student to open and review. They can afterwards discuss the grammatical or linguistic mistakes identified in the educational materials.

KnowledgeBase is a *Learning Management System* (*LMS*) that was implemented in 2016 by Associate Professor Cosmin Sabo in the Technical University of Cluj-Napoca, with the purpose of facilitating and improving the teaching-learning process within the academic environment. When the pandemic prevented the direct contact among people, this Moodle platform that had been already established was the perfect solution to a less anticipated problem. KnowledgeBase enables the storage and delivery of learning content for the purpose of training and educating students, and currently hosts 10,000 users and around 50,000 activities dedicated to the students of the Faculty of Humanities, Faculty of Sciences and Faculty of Engineering located in Baia Mare (a division of the Technical University of Cluj-Napoca). KnowledgeBase has become the new classroom, students being enrolled in designated subjects of study and teachers having the opportunity to share their resources. The teaching stage in the learning

process was supported by the options the platform gave to instructors to upload educational materials within designated courses, such as books, files, or folders. Students benefitted from the practice and consolidate stage through activities and assignments associated with each topic. The modules enabled a teacher to communicate tasks, collect students' work and provide feedback and grades. The platform allows students to submit any digital content, such as word-processed documents, spreadsheets, images, or audio and video clips, so the tasks were diverse and adapted to the learning aims of each ESP unit. The main assessment tool we have used was the quiz activity, which enabled a teacher quizzes comprising questions of various types, including multiple choice, matching, short-answer and numerical. The teacher can allow the quiz to be attempted multiple times, with the questions shuffled or randomly selected from the question bank. A time limit may be set. Each attempt is marked automatically, with the exception of essay questions, and the grade is recorded in the gradebook. Assignments can be graded using a numerical or custom scale or an advanced grading method such as a rubric. Final grades are recorded in the gradebook. One of the options we found particularly useful was the attendance activity module, which enables a teacher to take attendance during class and students to view their own attendance record. The teacher can create multiple sessions and can mark the attendance status as "Present", "Absent", "Late", or "Excused" or modify the statuses to suit their needs. Reports are available for the entire class or individual students, so the virtual classroom spirit was as close as one can get in online education. We found BigBlueButton, the open source web conferencing system for distance education associated to KnowledgeBase, useful but limited, so we choose to use Zoom instead.

Zoom was founded in 2011 and the IDC MarketScape has positioned it in the Leaders Category for European Collaboration Tools for Education, 2020 [16]. It is simple and easy to use, one of its greatest advantages being the fact that participants do not need to have an account to join the class. Nevertheless, as with other videoconferencing tools, one needs a good internet connection to use audio and video options to their full potential. Beside the basic features like chat box and screen sharing, we have frequently used the annotate your screen option together with the whiteboard feature. The annotation tools allow teachers to really engage with their teaching and learning materials by drawing, writing and highlighting anything on the screen, so that learning is more accessible and visually appealing. Screen annotation tools can be used to guide students and explain some concepts, and the remote control option makes the interaction extremely easy, as if literally passing the whiteboard marker from the teacher to a student. Zoom allows the teacher to explore and assess students' four skills in a more complex way, making the lessons more interactive, and it is great for larger classes, as up to 100 participants can join the basic package. One of our favourite options was the utility of breakout rooms, to set up small team activites similar to the ones in a standard learning environment. As the host of a meeting, the teacher can manage participants in a complex way, using features that can greatly benefit the educational process. As the instructor, one can join breakout rooms, broadcast messages to the breakout rooms, and end the breakout sessions when it is time to regroup. Using

the chat tool can encourage engagement by allowing more students to interact within the live activity, its main advantage over the traditional classroom being the large number of responses that a teacher might get instantly and almost simultaneously, without students influencing each other. The non-verbal feature of raise hand also facilitates communication and students taking turns without interrupting the meeting.

Having found the most convenient and efficient channels to facilitate the online interaction with students in mechanical engineering, we have expanded towards online tools and platforms that add value to their learning experience. We shall further provide a series of ideas ESL practitioners could find useful in the teaching process.

PowerPoint Presentations are maybe the basic element in online teaching, as they easily introduce information and represent a starting point for any kind of activity. Microsoft PowerPoint is a presentation program, created by Robert Gaskins and Dennis Austin and released on April 20, 1987. It was initially developed for business use, but in time it has grown to have wide applications for schools and community organizations. The program was packaged as a stand-alone product, but its inclusion in the best-selling Microsoft Office suite assured its near-total dominance in the presentation-software market. [17] The slides can basically accommodate text and images, so they fast replaced handouts. Moreover, they facilitate interactive content and allow complete freedom for teachers to introduce topics and design the presentation in a suitable and enjoyable manner.

twinkl.co.uk is a platform created in 2010 by Susie and Jonathan Seaton with the purpose of helping those who teach. All Twinkl resources are **teacher-made** and can be used by anyone and anywhere, with the aim of **making learning accessible to all**. Although the resources are typically addressed to learners of general English, we made use of those designed for the subject Design and Technology, which is compulsory for the native speakers of English in their Key Stage 3 and 4 according to the National curriculum of England. [18] Given the topic of Materials, we have introduced students in mechanical engineering to texts that organize their knowledge and introduce specialized terminology in their field of interest [19] as well as consolidate terminology through quizzes [20], differentiated homework worksheets [21], crosswords [22] and reading comprehension activities [23], and ultimately revise the chapter [24]. Some of the resources are provided as such, others can be adapted to more specific needs, and others are interactive and perfectly suit the online learning process. Most of them can be adapted to individual, team, group, or whole class tasks.

Another lesson creator platform that allows teachers to structure a learning unit around a video is TED-Ed [25]. Aiming to enhance the listening skills of the students and their comprehension, this tool can be adapted for the teaching phase, formative assessment, or summative assessment purposes by altering the types of questions associated to the video. The steps towards creating a lesson start with the teacher finding a suitable video for the field of interest of the students and their average level of English knowledge. One can customize a TED-Ed Animation or import one from YouTube or other sources. Once it is uploaded onto the

platform, the teacher may add questions, discussion prompts, or any other additional resources. The option of Creating a lesson takes the teacher through a series of stages that begin with giving the lesson a tile, followed by the option to write an introduction (Let's Begin), insert a series of multiple choice or open-ended questions (Think), add supplementary resources to encourage further exploration (Dig Deeper), facilitate an interactive class discussion (Discuss), and end it with a closing moment (And Finally).[26] Once the students cover the lesson with the teacher's supervision and support, their progress can be monitored. If the students work independently and the teacher is only notified when they have completed the lesson, comments and reviews of their performance can be provided individually. TED-Ed is a tool which contributes to the motivation of students and represents a fair assessment of their progress if the videos available are consistent with the curricula.

In 2005, Ulla-Maaria Koivula, a Ph.D student at the University of Helsinki in Finland, had the idea to develop a tool where she could integrate information and links directly into images, so she founded an education and media technology company. ThingLink is a digital tool that provides an easy way to improve the learning experience of children, including those with learning disabilities. This innovative tool has been selected to receive the 2018 UNESCO King Hamad Bin Isa-Al Khalifa Prize for the use of ICT in Education.[27] It is a platform that improves engagement and learning results because of its options to operate with interactive media such as images, videos, virtual tours, 3D models and simulations. It is a visual learning solution, as the teacher may start from the image of an object to which interactive tags may be added in order to engage the learners into discovering the specialized terminology in English. The tags may consist of different types of texts, descriptions, definitions, charts, detailed photos or videos imported from an external source or original ones generated by the teacher for the sole purpose of the lesson. While this tool is ideal to introduce information and enhance students' receptive skills, there is a Poll tag option that allows teachers to collect anonymous feedback or get learners' opinions using single choice questions.

As practice and consolidation are the keys to success in assimilating and mastering knowledge in English, we shall further refer to the interactive platforms we found most efficient in our educational endeavor during the pandemic.

The idea of Wordwall began in a secondary school classroom in London (UK) in 2008 with the attempt of a teacher to replace the laminated words traditionally used to support literacy with a program that comprised a list of words for the same purpose. [28] Wordwall.net was launched in 2016 and it can be used to create both interactive and printable activities, its strong point being the template system that facilitates the teacher's job by allowing the creation of a fully interactive activity in just a couple of minutes. It is fast and easy to use, especially in educational activities that focus on specific terminology. Once an activity on a given topic is created, the teacher can switch it to a different template with a single click. For example, after a Quiz is created for students in mechanical engineering in order to consolidate their knowledge regarding composite materials, it can be instantly turned into a Wordsearch activity, or a

Crossword may be transferred into a Match activity comprising the same concepts. There are several types of subscriptions for a teacher to access the options provided by the platform, but we consider the basic option which is free of charge to be enough when combined with other interactive platforms, as it provides the following 18 basic templates that can be used as assignments: Quiz, Match up, Random wheel, Open the box, Group sort, Labelled diagram, Find the match, Missing word, Random cards, Wordsearch, Gameshow quiz, Unjumble, True or false, Anagram, Matching pairs, Maze chase, Flip tiles, and Image quiz.

iSLCollective.com stands for Internet Second Language Collective and it is a community of language teachers from around the world who share their home-made PowerPoint presentations and worksheets on this free-to-use platform set up in 2009 by Peter Laszlo, Adam Laszlo and Benedek Princz from Hungary. The best feature of this platform is the video quiz generator, a tool that allows teachers to create a popup quiz in just a few minutes. The learning opportunities are very complex, as any video on YouTube can be turned into a listening comprehension exercise, with a focus on specialized terminology or grammar. As the practical course of ESP dedicated to students in mechanical engineering encompasses a chapter on composite materials, we have used a ready-made quiz [29] to review such specific vocabulary. The video is actually an advertisement for a composite material used in Formula 1 and there are fill-in-the-blanks type of exercises inserted every few seconds, to check students' listening and comprehension skills. Such vocabulary booster type of activity addressed to students of B2 level of English is a sample of real-life situation they might encounter in their future job in this field. The transcript can be further used to support the pronunciation and the reading skills of the beginner students, as well as to encourage the speaking skills of the advanced ones within a session of debates.

Quizlet is a digital learning tool that contains sets of study materials and has a section dedicated to mechanical engineering [30]. They can be used free of charge by students who want to self-assess their knowledge both in their field of study and in terms of English language. In the first stage of designing the educational material, the platform imports information provided by the teacher and converts it into flashcards. [31] The second phase within the set of study converts that information into six different study modes making it useful for any type of learner. One of the strong points of this platform is the fact that it facilitates an inclusive learning process, so that students with learning disabilities can acquire, retain, and use specialized terminology and information. [32] The Learn section facilitates the association of a definition with a correct answer that must be checked in a multiple-choice type of activity. The Write section asks the learner to write the translation of the definition associated to a flashcard that is not visible. The Spell mode asks the learner to type what he/she hears. The Test section comprises true/false questions, multiple choice questions, matching questions and written questions. The last two sections are labeled as Play through Match and Gravity, the former asking the learner to drag corresponding items onto each other to make them disappear, and the latter encourages the students to protect the planet from asteroids by writing the correct

translation of the text written on the falling asteroid. When teaching mechanical fasteners for example, Quizlet can be a useful and enjoyable tool employed in the learning process.

Liveworksheets is a platform that allows teachers to transform traditional printable materials into interactive online exercises, therefore a standard piece of paper or a plain doc, pdf or jpg can quickly include sounds, videos, drag and drop exercises, join with arrows, multiple choice and even speaking exercises. Although there is an extensive collection of thousands of interactive worksheets, the materials needed for students in mechanical engineering are quite limited, so the platform is best used to create educational content rather than to import some already made ones. [33] There is a category of worksheets and online exercises on the topic of Mechanics [34] and Engineering [35] that one may select in order to check the available resources, but we chose to create ESP content that provides learning opportunities customized for students' needs. The simplest way to use the interactive worksheets is to create them on the platform and send their generated link to the students, who do the tasks and afterwards send the answers back to the teacher directly from the platform. Although the activities generated by the platform are predominantly individual tasks, one of the advantages we have identified is the fact that students are graded automatically at completion of a worksheet, so each learner can have instant and individual results. There are no templates or restrictions in terms of the materials one can transform into interactive worksheets, which allows teachers of ESP great flexibility to design the suitable content.

The stage that closes the educational cycle and generates new learning opportunities is the assessment. According to Bransford, Brown, and Cocking [36] assessments and feedback must focus on understanding, and assessments that emphasize understanding do not necessarily require elaborate or complicated assessment procedures. Even multiple-choice tests can be organized in ways that assess understanding.

Quizizz is a very popular and free of charge online tool that allows teachers to create assessment activities that can be presented live as a timed competition or used for homework with a specific deadline. It has a straightforward layout, and operating the interactive tasks is intuitive. A valuable feature is the fact that students can review their answers, and the immediate feedback can be used by teachers to revise and adapt the learning activities by putting a larger emphasis on specialized concepts that students struggle with. While the Quizizz library provides almost 60,000 results for the search of the keyword Mechanics and over 76,000 results for the search of the keyword Engineering, we consider the platform offers the best learning experience when the tests are customized according to the exact topic of study and the English level of the participants. Each quiz can include any of the following types of exercises: Multiple choice, Poll, Fill-in-the-blank, Open-ended, Draw and Slide. A further step implemented by the learning platform is to allow the creation of interactive lessons that incorporate the already set quizzes together with new Media content including embedded web pages.

LearningApps.org is another platform that can generate a vast range of interactive activities, the design of the educational content being in the teachers' hands. The process is fast

and easy, as the templates just need to be added with content and shared with students. There are several types of activities that can be created and adapted to the level of English knowledge of the students, the main options being the following: Matching pairs, Group assignments, Number line, Simple order, Freetext input, Matching pairs on images, Multiple choice quiz, Cloze test, Audio/video with notices, The Millionaire game, Group puzzle, Crossword, Word grid, Guess that word, Pairing game, Matching matrix, Fill table, and Quiz with text input. [37]

One of the most complex and useful interactive platforms we have identified and started using during the pandemic is Nearpod. It is a very useful tool for teachers because it facilitates the creation of interactive lessons that work for in-person, online, or asynchronous learning. Besides the ready-to-teach or customizable lessons, it provides dynamic media experiences, as it allows flexibility and creativity in content design. The platform can simply act as a substitute for other presentation tools, as one may import PowerPoints, Google Slides, PDFs, videos or pictures, or it can become the virtual space for interactive teaching, consolidating students' knowledge and organizing formative or summative assessments. Students have the option of keeping up with the lesson at their own pace, as teachers can easily switch between synchronous and asynchronous teaching modes within a single Nearpod lesson, video, or activity. Teachers may select a group of slides or activities from their lesson for Student-Paced work and can revert back to Live Participation anytime. Thus, students who are ready for the next step move forward in the lesson while those who need more time can benefit from it without feeling left behind. This is particularly important in groups of students that have significantly different levels of English knowledge. ESP for students in mechanical engineering requires a lot of visual material, so the lessons would usually begin with a video with subtitles, followed by descriptive slideshows and other relevant web content. The Collaborate Board is very convenient for brainstorming activities and writing tasks, while Time to climb and Memory test bring a joyful experience while stirring competition. The teacher can create customized Quizzes, Polls, Open-ended Questions or Matching Pairs to check students' understanding of specific terminology and can also make adjustments or provide immediate support and clarification when needed. All results are included automatically in a report Nearpod creates, so that the individual progress and group dynamic can be monitored constantly for a more efficient educational process. The 'Open-Ended Questions' feature allows the teacher to launch a question or a scenario for the students to respond to, encouraging creative writing tasks.

One of the most complex tools, that facilitates the transition from educational assignments to job related tasks is Genial.ly. This is an online tool that can be used to create still, animated, or interactive visuals, such as posters, infographics, quizzes, and presentations. It is mainly addressed to students, who are required to create visuals that may be under the form of general presentations, dossier and report, learning experience, gamification, interactive image, horizontal infographic, vertical infographic, guide, video presentation, personal branding, social, story, or blank creation. Starting from the premises that it is easier to

understand visual and interactive content [38], the founders of this platform stress the importance of interactivity that makes people explore and discover information on their own. There are free templates, a rich resource gallery and other features that are included in the free of charge basic option for those who are interested in education. Given the complexity it provides, the platform set up in 2015 in Spain offers online tutorials and ongoing support through Genially Academy, a feature that assists learners in their journey. Students in mechanical engineering can use this tool in order to describe and promote various types of equipment and technology used in their field of activity, and the platform can increase their engagement in learning and allow them the freedom to express their knowledge and develop their communication skills.

3. CONCLUSIONS

Given the constant challenges and changes determined by the pandemic we are currently experiencing, the learning environment is becoming more interactive and efficient than ever, with rapidly and creatively invented and improved platforms and tools. The pandemic has accelerated and amplified trends in education that were already in motion. In the 1960s and 1970s the business environment started offering computer-based trainings through Plato, which was developed by Control Data and the University of Illinois back in 1963. During the 1970s and 1980s TV based technology was employed to support live training. As technology evolved, the 1980s and 1990s brought CD-ROM trainings and the Learning Management Systems (LMS) in education, the computer-based courses being an important landmark for the evolution of the current interactive learning experience. Christopher Pappas, the Founder of eLearning Industry Inc stated that "Blended learning, and eLearning as a whole, has seen rapid change in the past two decades, beginning in 1998 with the first generation of web-based instruction. Computers were no longer just for organizations and the wealthy few, but for the masses." [39] The technological boom of the 21st century has transformed blended learning into a complex experience that allows students maximum flexibility, and the pandemic that facilitated online learning, e-learning and blended learning represents a point of no turning back in the evolution of education.

Boelens, Van Laer, De Wever, and Elen defined blended learning as "learning that happens in an instructional context which is characterized by a deliberate combination of online and classroom-based interventions to instigate and support learning" [40] while Garrison & Kanuka, [41] stressed the fact that the online element should not solely be an addition to classroom-based teaching, as blended learning should be the result of effective integration of both virtual and face-to-face methods.

Studies by López-Pérez, Pérez-López, and Rodríguez-Ariza [42] and Boyle, Bradley, Chalk, Jones, and Pickard [43] noted that the introduction of blended learning in higher

education courses improved retention and correlated with improvements in students' attainment. Additionally, Stockwell Brent, Stockwell Melissa, Cennamo, and Jiang [44] found that blended learning courses improved attendance at face-to-face classes, in self-report measures of student satisfaction, and in examination performance. Once we had to transfer the practical course of ESP in the online environment during the pandemic, we have also experienced a higher level of curiosity and interest in the interactive activities from students in mechanical engineering.

Garrison and Kanuka [41] argue that blended learning is effective because it questions the traditional lecture-based teaching model, allowing classroom time to focus on more active and meaningful activities. Moreover, Delialioğlu [45] found that problem-based, rather than lecture-based, blended learning had higher levels of student engagement. In the current context of hybrid learning, with some practical activities being held in face to face format and theoretical courses being delivered online, our ESP practical course could benefit fully from both approaches. The online activities can be used to both reinforce learning undertaken in the classroom, and to serve as a basic introduction to topics before they are covered in more depth in class.

Whilst blended learning is a valuable tool which enables students to work independently and develop their receptive and productive skills, individuals respond differently to the challenges depending on many factors. In a study conducted by Wivell and Day [46] students reported that self-motivation, self-reliance and the ability to work independently were essential to their success on the blended learning course. However, students who already struggled in the face-to-face delivery struggled to adapt to the demands of the blended program as well. Moreover, Pérez and Riveros [47] found that whilst a blended learning program generally increased students' autonomy and responsibility for their learning, a common complaint from instructors was that some students did not engage with the online activities or complete the online assignments. Similar conclusions were reported by Chen and DeBoer [48], who found that the most successful students were those who engaged more frequently with the online materials. The practical course of ESP offered in the university during the pandemic and blended learning programs depend on some factors that are less related to the educational drive and more to the mere access to technology and reliable internet providers.

According to a 2021 survey by Qualtrics, commissioned by Zoom, "Many respondents have a preference for in-person learning going forward, but are open to virtual when in-person is not available." [49]. The experience of learning remotely during the pandemic left students with a positive attitude towards online and hybrid courses. Education in a post-pandemic world has to combine the advantages of e-learning with important pedagogical goals associated with in-person teaching. Therefore, we consider that blended learning is the best form of education in terms of ESP addressed to students in mechanical engineering.

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