

The use of ESP, MOOCs and the occupational world in the field of system engineering

El uso del inglés para propósitos específicos a través del MOOCs y el mundo ocupacional en el campo de la ingeniería de sistemas

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Abstract: The development of English communicative skills has become in one of the most critical requirements in the system engineering learners, for its competitive occupational market. It has affected countries which their native language is not English. Thus, they have seen the need to provide the learners English for specific purposes to get foreign languages skills in a specific domain. Engineering education is much more complicated than the other careers because it is technical, that's why students need to enhance their Professional English skills due to the fact their training involves the use of English continuously such as in the building of software, electrical device, online applications and so on. A new e-learning approach named MOOCs has disseminated the Higher Education context, due to the fact they enable the enrollment of a mass of learners in open online courses. Regarding the findings in this research for learning ESP efficient, the use of MOOCs would empower the development of communicative skills around the world. Also, the critical issue to use a MOOC is that engineering content is part of MOOCs, as well as any other educational tools in the technological worldwide. In methodological aspects, both ESP and MOOCs focus on Content-based instructions and Communicative Language Teaching with the assistance of task-based activities and network-based through authentic resources. As CBI and CLT base on the acquisition of a foreign language while the students are learning the content and style of a specific subject. However, this massive open online course is a luxurious investment.

Keywords – *MOOCs, communicative skills, e-learning, ESP, CBI instructions and CLT base, educational tools.*

Resumen: El desarrollo de las habilidades comunicativas en inglés se ha convertido en uno de los requisitos más importantes en los estudiantes de ingeniería de sistemas, para su mercado laboral competitivo. Lo que ha afectado a los países es que su lengua materna no es el inglés. Por lo tanto, han visto la necesidad de proporcionar a los estudiantes el inglés para fines específicos para obtener

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habilidades en idiomas extranjeros en un dominio en particular. La educación en ingeniería es mucho más complicada que las otras carreras porque es técnica, por eso los estudiantes necesitan mejorar sus destrezas de inglés en el ámbito profesional debido a que su carrera implica el uso continuo de este idioma, como en la construcción de un programa, dispositivos eléctricos, aplicaciones en línea. Un nuevo enfoque de aprendizaje electrónico denominado MOOC ha diseminado el contexto de la Educación Superior, mediante el cual permite la inscripción en cursos abiertos en línea de una gran cantidad de alumnos. De acuerdo a los resultados en esta investigación el aprendizaje de ESP a través del uso del MOOC potenciaría el desarrollo de habilidades comunicativas en todo el mundo. Además, el tema crítico para usar un MOOC es que el contenido de ingeniería es parte de los MOOC, así como de cualquier otra herramienta educativa en el mundo tecnológico. En aspectos metodológicos, tanto ESP como MOOC se centran en las instrucciones basadas en el contenido y en la enseñanza del lenguaje comunicativo con la ayuda de actividades basadas en tareas y basadas en la red a través de recursos auténticos. Como CBI y CLT los cuales se basan en la adquisición de un idioma extranjero mientras los estudiantes aprenden el contenido y el estilo de un tema específico. Sin embargo, este curso en línea masivo abierto implica una inversión de lujo.

***Palabras clave** – Cursos abiertos en línea (MOOCs), habilidades comunicativas, aprendizaje electrónico, inglés para un tema específico (ESP), enseñanza basada en el contenido (CBI) y el lenguaje comunicativo (CLT), herramientas tecnológicas.*

INTRODUCTION

In the present globalized occupational world, English communicative skills are regarded as important as the other major related abilities to the learners' professional field. That's why English for Specific Purposes must be in the curricular system of Higher Education in countries where their mother language is not English, to increase the competitiveness of their learners in this modern society. System engineering is a technical career that requires continuously Professional English, due to the fact the content of the program which drives the learners are in English. In the overseas market, system engineers must develop High-quality communicative skills for employability. Therefore, engineering students should be provided with an adequate communicative environment where they can be able to build their foreign language skills.

The presence of the MOOCs (Massive open online courses) has appealed the universities attention because it is seen as a new age of Higher Education system that will change the learners' life in the world. These open online platforms enable the enrollment of millions of international learners to access the professional content of a specific domain. Thus, the use of MOOCs for learning ESP in the field of system engineering is seen as a powerful instructional tool, due to the fact the students are familiarized with the interaction of these platforms. Besides, ESP and MOOCs focus on learners' workplace needs in the current world. The methodology that both foster is the content-based instruction (CBI) and Communicative Language Teaching (CLT) approach applied in task-based and network-based instruction which prepare the learners to get communicative skills in peer-to-peer interaction and peer-to-peer assessment within the context of a specific academic subject through authentic activities given in variable contexts relate to the real world. Given these issues, it is the exceptional importance to focus on the system engineering students' needs in this competitive occupational world and the use of MOOCs for learning English for specific purposes efficiently and successfully in this field.

LITERATURE REVIEW

The use of English for Specific Purposes (ESP) has been disseminated in many English-Speaking countries since early 1960 by Dudley, due to the fact it was seen the need to communicate through languages in areas such as commerce and technology for political matters. (Paltridge, and Starfield, 2012). Thus, it has now as a purpose to provide the teaching and learning of discourse for specific features relevant to learners' needs in their professional fields. That's why ESP was divided in English for Academic Purposes (EAP) and English for Occupational purposes; however, it has now expanded on other areas to cover the competitive job market worldwide, for instance, English for vocational, medical, business, legal and sociocultural. (Belcher, 2009, as cited in Paltridge, and Starfield, 2012). Viewed in this way, it would assist the learners of any areas to gain awareness of meaningful topics to understand specialized texts and cope trustfully and accurately talks on their job placement and academic settings. Nevertheless, Hutchinson and Waters (1997, as cited in Simion, 2015) explain that:

“ESP is not a matter of teaching’ specialized varieties” of English. ESP is not just a matter of science words and grammar for Scientists, Hotel words and grammar for Hotel staff and so on. ESP is not different from any other form of language teaching in that it should be based in the first instance on principles of effective and efficient learning.”

Therefore, the teaching in ESP context should take into account critical issues to be carried out with effectiveness, and so be able to get successfully learning outcomes. Those mean combining the development of linguistic skills and together with expertness of specific content, as well as involving input materials, suitable methodologies, and strategies which appeal the learners' attention and interest heartening them to be participants in this learning process. It addresses that ESP has had a positive growth becoming as one of the most prominent areas of ELF Teaching today.

Research done (2013) by a Korean system engineer shows the needs to develop an ESP course for engineering students to be hired in Asian countries. English has become in one of the most important abilities to be mastered in the job seekers' major fields around the world, especially in engineers' field who see technological terms in their whole career. D. -j. Song (2010) said “Practical English or Language related subject” is the most useful subject to get a job among the ‘Specialized General Curriculum Subjects’ in the accreditation system. Therefore, the development of an ESP syllabus should be articulated based on the learners' needs, the goal of the program and the English teaching approach to get successful learning outcomes. This study was carried out with three different groups which were students group, engineering professors group, and industry workers team to get a broader perception on the importance of learning English for specific purposes in this field. Students are given general English in the basic courses and ESP once they are in advanced levels. Concerning job, the findings revealed that professors and industry workers regard written comprehension and written expression are very important, but students did not agree. Everyone agrees that speaking skills should also be developed in an ample portion with topics about daily conversational English, general business English to work for an industry. To be even reached it, they need to familiarize themselves continuously with engineering contents as well.

Given these issues, a new e-learning approach has been empowered the Higher Education worldwide since 2008 which bases on Massive Open Online Courses (MOOCs). It is seen as a “revolution in education” by many experts; however, it is said by other experts that it is too soon to

assure a concrete meaning. Gaebel (2013), defines MOOCs as “online courses with no form all entry requirement, no participation limit, and free of charge.” Meanwhile, Oxford online dictionary says that “a course of study made available over the Internet without charge to a considerable number of people.” Therefore, MOOCs were developed to provide free widening participation of millions of international audiences, who not only need a high-quality education but also it should not be luxurious with unpredictable schedules. These online platforms allow the students to get open access to meaningful and accurate content relevant to a specific field through the authenticity of educational resources. Furthermore, they let the learners be continuously trained without attending a face-to-face class which eager to learn because it is not as the traditional online courses. Nevertheless, since a few years ago there have been some misconceptions about MOOCs principles, due to the fact, nowadays, it has hugely become pricey and not available for everyone.

Mooc was used for the first time to give a course called “Connectivism and Connective Knowledge” by George Siemens and Stephen Downes in the University of Manitoba, Canada. This online course was given free through various blog aggregators and no based on a specific platform; however, it had signed approximately two thousand and three hundred learners. According to Pence (2012) “this course was highly social in format, experimental, non-linear, and participatory. This interaction resembles that in a massively multiplayer online game (MMOG), which was the basis for calling this format a MOOC”. Soon after, oocMOOCs were spread successfully and massively opening courses about science and technology topics, for instance, “Introduction to Artificial Intelligence” in 2011 garnering over a hundred and sixty thousand learners from a hundred and ninety countries. It was given by Sebastian Thrun, professor of Stanford University, and Peter Norvig, Director of Research at Google. That’s why Sebastian Thrun founded the first service provider Udacity with the assistance of David Stavens and Mike Sokolsky. Given this fact, MOOCs were gained popularity and recognition in the educational context among the most distinguished American universities during 2012. That interest made possible the spread of new platforms like Coursera and edX which offered open courses via online broadcast with hot topics like “Building a Search Engine”, “Circuits and Electronics”, “Introduction to Computer Science”, and a new version of “Circuits and Electronics” that showed how a group of students built virtual circuits in an online lab getting a hundred and seventy thousand viewers signed. (Sanchez & Luján, 2014). Despite all of these achievements, the rates of the MOOC audiences had waned by the end of 2013 seen as the year of anti-Mooc because they did not fulfill all the goals.

“Many students do not see the prospects of using a foreign language in their professional activities, since the educational process is not filled with personal meaning and is often divorced from the professional reality.” Rybushkina and Chuchalin (2015) of the Tomsk Polytechnic University in Russia proposed a new approach thinking in engineering students to increase their competitiveness of their graduates in the global labor market. This study is based on teaching ESP using MOOCs (Massive Open Online Courses), due to the fact these platforms are regarded as a didactic tool where engineering content is provided in a foreign language which gives the opportunity for non-English Speaking technical careers to build a naturally integrated course of a foreign language for specific purposes. With the assistance of ESP instructors and members of the engineering faculty shortlisted courses that fitted programmed outcomes. The findings address that MOOCs in teaching ESP provides high-quality content and access to international community service, as well as it expands the student's professional vocabulary and communication skills through the integration of engineering content. Furthermore, it ensures unbiased assessment of learners' achievements in measuring tools. Despite all

of these, most of MOOCs provide basic knowledge of the subject and can not be used as a master level. And another reason is because they are limited by copyright.

According to Konnikova (2014) “Online education is a technology with potentially revolutionary implications—but without a precise plan for realizing that potential.” It points out that this new e-learning approach could not assure the enhancement of the learners enrolled in a massive open course via an online broadcast. The San Jose State University with the collaboration of Udacity did a project that was based on getting two types of learners signed on the same platform about a remedial algebra course to analyze their learning. It showed that both groups got a low average, the learners who were registered in the university got better grades, while the learners who just were enrolled in the Udacity platform, got the most moderate, thus, that course was suspended for reassessment because it did not work as they had been considered. Another analysis was made by Jennifer DeBoer with the assistance of the edX platform, the purpose of this project was to enroll post-doctoral learners in their plan which generated different results in comparison with the first analysis. She found that viewers who got the best grades were who had already succeeded academically. (Kannikova, 2014). Regarding both studies, MOOCs shuffle was addressed in a wrong perception, due to it should be given learners who have prior knowledge to improve their intellectual skills more than they have. It viewed in this way. It was an excellent opportunity for learners who want to enhance their professional development in a domain in particular for survival and employability.

A study carried out in the Universidad de Educacion a Distancia, in Madrid indicates that Language MOOCs differentiate from the other MOOCs, due to the fact they focus on the development of oral communication skills as a means among students to transfer a message clearly and professionally across particular activities about social and working life subjects, meeting, job interview, and other topics relate to the labor world. In contrast to MOOCs for different disciplines, due to the fact, the students enrolled in this platform should have a primary or intermediate level of proficiency to be able to handle advanced educational resources available there. (Monje, Bárcena, and Ventura, 2013). Therefore, this research was based on Lane’s classification Moocs (2012), which involves network-based or connectivist MOOCs where the learning is built on actions and experiences through a network of connections; content-based MOOCs focuses their content on the community needs, and task-based MOOCs is a mix of instructivism and constructivism. In addition, to analyze peer-peer interaction was taken account some key strategies and mechanism that have improved students' oral and written production since the last couple of years such as the use of CALL (Computer-Assisted Language Learning), social networks, web 2.0 tools, and discussion boards as well. The method of free social media tools like Google Hangout or Skype is part of Language learning MOOCs, and peer feedback through videos are also desirable assessment strategy to be fostered in Language MOOCs as General as Professional to pose the challenge of both instructor and students. The findings show that peer-to-peer interaction made students be immersed in continuously practice that did not drop out the course because of they felt motivated. The improvement of automatic peer assignment according to the age of group and proficiency level should be concerned in future research on this field.

RESEARCH QUESTIONS

How can the use of ESP MOOCs and the Occupational world be going to be useful in the field of System Engineering?

RESEARCH PLAN

ESP Moocs is a dynamic tool to develop engineering learners' communicative skills to interact suitably with people who are involved in the same field of science and technology like colleagues, customers and business partners. Nevertheless, due to the expensive cost of the Moocs service has provoked that the entries of learners have declined, thus it is important to acknowledge that's why many Latin American universities do not provide this e-learning approach. Taking into account it, Higher institutions could apply blogs, google skype, social networks or others online tools instead of Moocs. Given this issue, it is suggested the following proposal of an ESP course for system engineering students who are considered pre-intermediate language proficiency level.

Firstly, the content and educational resources should be shortlisted thinking in students' needs according to their profile outcomes, preferences, and language level to appeal their attentions and hearten them to enhance their communicative skills. Additionally, teaching and learning target should be designed to provide students comprehensible input through the method content-based instruction applied task-based and network-based activities which embeds language and content with the integration of the four skills.

In the chart below can see a brief explanation of the content and skills which would carry out during the ESP course for system engineering students.

Table 1. This information is based on Syllabus of the ESP course for system engineering field

Units / Topics	Content	Skills
Unit 1: Hot Topics in Science and Technology.	1.1.: Introduction to Computational Thinking and Data Science.	Listening and taking notes , listening to short and long conversations, identifying the topic of the lecture, etc. Speaking: task-based activities-describing /explaining /defining /classifying objects, Reading Skills:
	1.2.: Vocabulary: Embedded Systems-Shape the World.	
	1.3.: Science fair projects	
	1.4.: Case of study: Autonomous Mobile Robots	
Unit 2: Information and communication technology (ICT)	2.1 Design and Development of Educational Technology.	Scientific and technical texts, skimming for main ideas, scanning for specifics, Predicting, inferring and guessing the meaning, etc. Writing Skills: Definitions of technical terms, narration, description, enumeration, process, comparison and contrast, cause, and effect, argument, etc. Professional Speaking Skills (professional presentation skills, mock interviews, group discussions, seminars) Professional Writing Skills (Business letters, Technical reports, project reports,
	2.2 Vocabulary Mobile App Design	
	2.3 Networks, crowds, and Markets	
	2.4 Case of study: E-tailing	
Unit 3 Giving technical support	3.1 Customer Service	Professional Speaking Skills (professional presentation skills, mock interviews, group discussions, seminars) Professional Writing Skills (Business letters, Technical reports, project reports,
	3.2 Vocabulary: Managing Microsoft Windows Server Active Directory Domain	
	3.3 Dealing with problems by telephone	
	3.4 Case of study: Engineering Software as a Service	

Unit 4 Company and community	4.1 Entrepreneurship in engineers' world.	proposals) Special Grammar Items in Scientific and Technical Communication (Use of modal auxiliaries in technical English, Conditional sentence, connectives in professional communication)
	4.2 Vocabulary: Emerging Technological Business.	
	4.3 Presentations – visuals and slides.	
	4.4 Case of study: How to Launch a Technology Company in 6 steps	

The assessment of learners' achievements would be measured according to their performances in oral communications in class like written and reading tasks, as well as listening notes-taking and eliciting specific information. Although, this ESP proposed course will not be given by a specific platform like a MOOC student would use a blog to be involved in a peer-to-peer interaction where they will be involved in discussion boards relevant to science and technologies hot topics in a chat room. Furthermore, they would be assessed peer-to-peer assessment about their written works at random.

RESEARCH INTERPRETATION

Regarding the information in the literature revision, this ESP proposed course will further give the students the opportunity to develop their oral professional skills it will disseminate their scientific lexicon through the CBI approach applied in Task-based like professional written letters or advantages and disadvantages of electronic devices. Furthermore, Network-based activities in the blog enable learners to acquire knowledge peer-to-peer interaction such as discussion forums. Although the application of MOOCs is not part of this result, the use of blog will assist learners in gaining experience from the network. Learning strategies base on students' needs, preferences and language proficiency level, as well as authentic educational resources related to current issues in applied science and technology. For instance, creating and delivering professional presentations, promoting a new brand technology, giving their points of view about any topic in particular, etc. Therefore, in choosing important and accurate content base on learners' learning outcomes to be ready for competitiveness in this modern globalized world, it is hoped it heartens them to be participants in class and after class across the use of blogs promoting peer-to-peer interaction and assessment.

CONCLUSION

Throughout on search on ESP using MOOCs, it is seen that this e-learning approach has become viral gaining popularity in the educational environment. On the one hand, the findings address that the ESP courses using MOOCs would be a perfect combination to provide meaningful content and language in the field of system engineering because the learners handle this sort of technological tools in their workplace. Viewed in this way, it is an advantage for millions of international learners who have access to this continuously training in the engineering worldwide. On the other hand, the commitment of finishing successfully this kind of open online courses should be assumed by the learners because most of them dropped it out when they feel lost driving it or frustrated not to receive their feedback.

This is due to those are not accustomed to studying in these platforms via online broadcast which implies a significant effort of self-study and persistence. Many world's best universities use ESP MOOCs such as Stanford, Harvard, MIT, that guarantees the high quality of content, but not all of the colleges can afford this service or to be a service provider, due to it implies a luxurious investment waning the entries of learners because they will not be free anymore.

Nevertheless, the learners' communicative skills can be developed by ESP courses without the Moocs usage, due to the fact they focus on the same methodology which are content-based instruction and CLT approaches. These are designed to foster classroom activities relevant to the real needs of the learners in their occupational worldwide. Additionally, Task-based and Network-based should enhance students' language learning skills integrating peer-to-peer interaction and peer-to-peer assessment through the blog and tasks. All of this process can be seen as the primary learning drivers in the acquisition of a foreign language. The content should be chosen by English teachers with the collaboration of engineering teachers to analyze the most remarkable topics to be learned by the students to get accurate and effective learning outcomes.

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