

WIKIS AS SUPPORT FOR ENGLISH STUDIES' DISTANCE STUDENTS TO ANALYSE AND PRODUCE EST TEXTS

LAS WIKIS COMO APOYO PARA ANALIZAR Y PRODUCIR TEXTOS CIENTÍFICO-TÉCNICOS DE LOS ESTUDIANTES A DISTANCIA DEL GRADO EN ESTUDIOS INGLESES

María Jordano de la Torre

Universidad Nacional de Educación a Distancia (UNED)

Abstract

This paper describes the evolution that a subject such as Inglés para Fines Académicos y Profesionales II: Textos Científico-Técnicos (IPAI) / English for Science and Technology has experienced to improve the quality of its teaching, characterised by the promotion of collaborative work among the students and the critical reading of bibliographic references recommended during the course. Due to its nature, with no face-to-face tutorials and based on the analysis and writing of short pieces of EST texts, the teaching team devised the idea of creating a shared space in the form of a wiki so that all students had access to the same working texts. The announcement of the closure of Wikispaces in July 2018 has obliged the teaching team to think about other alternatives for collaborative work without affecting the instructions provided in the course guide. Although some of the most useful features -such as delving into the history of changes for later analysis- have been lost with the modifications carried on during the year 2017-18, others such as the debate on specific topics arisen from the analysis of the texts have been reinforced.

Key Words: English for Specific Purposes; English for Science and Technology; English for Academic Purposes; Collaborative writing; Digital Competences.

Resumen

Este artículo describe la evolución que ha experimentado una asignatura como Inglés para Fines Académicos y Profesionales II: Textos científico-técnicos (IPAI) con el fin de mejorar la calidad de su enseñanza, caracterizada por fomentar el trabajo colaborativo y la lectura crítica de las lecturas propuestas entre sus estudiantes a lo largo de todo el curso. Dada la naturaleza de esta asignatura, sin tutoría presencial y basada en el análisis y producción de textos cortos, el profesorado acordó la creación de un espacio común en forma de wiki donde de modo que todos los estudiantes pudieran acceder a los mismos textos. El anuncio de la clausura de Wikispaces en julio de 2018 obligó al equipo docente a pensar en otras posibles alternativas para continuar con el trabajo colaborativo sin interferir con las instrucciones que aparecían en la guía didáctica del curso. A pesar de que algunas de las características más interesantes de la wiki – como la de indagar en el histórico para detectar la autoría de todas las modificaciones del texto- se han perdido en el año 2017-18-, otras, como las de debatir sobre temas específicos, se han visto favorecidas, quizás por utilizar sólo un espacio en lugar de dos.

Palabras clave: Inglés para Fines Específicos; Inglés científico-técnico; Inglés para fines académicos; Escritura colaborativa; Competencias digitales.

1. INTRODUCTION

This paper explores the teaching and learning development of a subject based on the analysis of technical texts from a linguistic point of view through different perspectives. From the beginning, the teaching team had thought about the use of a wiki to analyse collaboratively all the texts included in the subject as a suitable solution to comment and ask doubts in the same way they could do it in a face-to-face context. However, the closing of the tool used to host a significant part of the proposed activities, Wikispaces, forced the instructors to think about other alternatives which could substitute it. Teaching English for Technology (EST) to students with a non-technological background requires an additional effort from both sides and a high level of multidisciplinarity from the teaching team to choose the right texts and evaluate them attending to different linguistic aspects. Due to the specificity of this discipline (Parkinson, 2012), the use of the Internet (Suau-Jiménez, Francisca; Ramírez Polo, 2016), has always been an excellent allied. Similar subjects to this can be found in different degrees related to Science, Technology, Engineering and Mathematics (STEM) or Translation Studies. Nonetheless, its inclusion in the Bachelors' Degree in English Studies is not so frequent as in the mentioned contexts. Among the universities which offer it, we can find Alcalá de Henares (Madrid), Universidad de Zaragoza (EAP) or Universitat Jaume I (Castellón). The approach varies from a STEM context to the linguistic one, being the first one more focused on learning a specialised instructional English, in opposition to the other, which tends to be more descriptive or normative.

2. THEORETICAL FRAMEWORK

2. 1 English for Science and Technology (EST)

EST arises in the early years of the English for Specific Purposes (1962-1981) to write about the experience gathered by language teachers when having to teach technical English to non-native students (Johns, 2012). One of the pioneers in this field, who served as a reference for many authors in the future, is Louis Trimble. He studied the rhetoric of a broad scope of EST texts, covering from the most formal academic articles to the not so formal style, "written for the layman" (Trimble, 1985), as it can be the instructions to install a car battery. These apparently opposed extremes motivated the sometimes-blurred division between English for Academic Purposes (EAP) and English for Occupational Purposes (EOP) (Acedo Domínguez & Edwards Rokowski, 2002; Haghghi, 2012). Hence, the first term refers to scientific professionals from an academic perspective (e.g. Engineering, Computer Sciences or Electronics) in opposition to technical occupations such as engineering technicians, mechanics or plumbers). Although EAP disciplines share some linguistic features, there are studies aimed to analyse their possible differences (Hamp-Lyons & Hyland, 2004). Additionally, other texts can be found in between, addressed to a specialised audience but not experts (Parkinson & Adendorff, 2004; Roger & Sergi, 2018), which corresponds to scientific and technological magazines or the sections of Science and Technologies found in some international daily publications. This type of discourse is also known as 'science writing', described by Day & Sakaduski (2011, p. 8) as "writing sometimes written by scientists but sometimes written by not scientists, for an audience of non-scientists". Parallel to Trimble; the academic and scientific genre analysis experiences a drastic advancement thanks to John Swales (Swales, 1990). Different factors determine the level of technicality of EST words, for example its

frequency of appearance in specialised texts, queasy specific texts or in general texts (Liu, 2012). Some authors distinguish three levels of the specialisation -specialised, semi-specialised and general terms used in languages of speciality (Hatam et al., 2009; Mudraya, 2006; Rusko, 2014). Others recognise five thanks to the Technicality Analysis Model (TAM): least technical, slightly technical, moderately technical, very technical and most technical (Ha & Hyland, 2017).

The present educational panorama is walking towards a future immersed in Content and Language Integrated Learning (CLIL) and English Mediated Instruction (EMI). This approach is catching the attention of many contemporary researchers due to the spreading of this sort of teaching in non-speaking countries in the higher education level (Barrios, López-Gutiérrez, & Lechuga, 2016; Drljača Margić & Vodopija-Krstanović, 2018). This scenario and the need to disseminate research in English could be some of the reasons which have provoked that more than a half of the publications written in English had been produced by non-native speakers of the language (Pérez Llantada, 2018). If we add the fact that most of them have been written to be read online (Kuteeva & Mauranen, 2018), it can be stated that the EST gender has experienced a drastic change from its origins, which took place more than 50 years ago. This is the sort of EST which is being produced at present and the genre which must be dealt in the study plans of our undergraduates.

2.2 The use of wikis in an online collaborative language learning context

Since the first wiki emerged in 1995 (Raman, 2006), this tool has received a pleasant welcome from language teachers. They are easy to use and present a very friendly interface that allows a quick edition anytime from any device. There are tools like PHP Works (Ortiz Navarrete & Ferreira Cabrera, 2014) or MediaWiki (Zheng, Niiya, & Warschauer, 2015) which presents an added difficulty, due to the fact that it need to be installed in a server. Others like Wikispaces have been used by many teachers of different disciplines probably because of its WYSIWYG edition system (Li & Kim, 2016). In the field of language teaching and learning, wikis can provide a platform for collaborative writing (Kuteeva, 2011; Roy, 2017), treat online anxiety (Kassem, 2017) create contents (Jordano de la Torre, 2009), translate (Talaván, Jordano de la Torre, & Bárcena, 2017) elaborating glossaries (Lázaro, Raquel; Pena, 2009) or promoting other collaborative tasks (Lin & Reigeluth, 2016; Zou, Wang, & Xing, 2016). Other authors use them as the perfect context to develop online tasks as a way to substitute the physical presence and connect students from different places (Windsor & Park, 2014). Many authors have incorporated wikis in their English for Academic Purposes classes (Kuteeva, 2011; Murray & Moore, 2006; Windsor & Park, 2014). Most of the mentioned authors coincide on the importance of a good project design to obtain a successful collaborative task.

3. METHODS

The methodology followed in this study is based on action research (Ivankova, 2014). This method consists of being able to make improvements in the teaching thanks to a constant feedback analysis of the students' needs. Some of the studies are mainly based on direct observation (Cutler, 2014), but the study here presented will be more focussed on the results of satisfaction questionnaires and the messages

sent to the forum, where they are continuously asked to report their experiences about their own learning processes. This practice permits to develop improvements based on the students' feedback and the observation process. Therefore, the main aim of this research is to analyse the evolution of a subject, seven years after its design, and more specifically, the influence of a wiki in the learning process of students enrolled. To do this, some questions have been proposed:

- Is a wiki a suitable tool to study IPAII in a context like this?
- If it has not been as successful as expected, which could be the main reasons?
- In which way the closure of Wikispaces has influenced the normal development of this subject?
- Could it be possible continuing working collaboratively without a wiki as a learning complement?

To answer these questions, a revision of the statistics generated by the different sections of the Wikispaces course site has been undertaken. This process begins with a general view of the activities proposed throughout the course and the number of visits received, continuing with a selection of some of the most relevant ones. The number of accesses to the forum of each wiki page has also been analysed together with the activity concentrated in the thematic forums, which can be found in the official online course. Apart from the information retrieved from the wiki and the thematic forums, it is crucial to relate these data to other elements of the course: continuous evaluation participation and results, questionnaires of satisfaction and success rates of the subject.

4. RESULTS AND DISCUSSION

The 125 credits of the optional subject are spread within five-credit units: Unit 1 English for Specific Purposes; Unit 2 English for Science; Unit 3 English for Technology; Unit 4 English for Science: Writing and Analysis; Unit 5 English for Technology: Writing and Analysis. Each unit comprises six main sections: Brainstorming / Contents (pdf) / Short activities (texts reading, collaborative work, debate) / Final questions / Twitter list (optional) / Google Community (optional) /Bibliography. All the contents of the subject are provided in the online course so that the students do not have to find any other material outside this environment. All the activities are included in the text file of each unit, the planner (as a link with the explanations) and as individual threads in the forum of its unit so that no messages can be sent in a different place. Although the twitter list and the Google Community are entirely optional, they are provided just in case any of the students want to enrich some of the topics studied during the course. It is a way of keeping the topics always alive with the announcements of events, grants, recommendations, etc. The additional bibliography can be found at the end of the contents file but also in a Mendeley group (divided into five folders), so that they can comment each item with other students, apart from adding their own suggestions. This system makes taht the complimentary bibliography could be updated almost at real time.

This subject began to be delivered in 2012-13 as an optional course of the fourth year of the Bachelor's Degree in English Studies. Most of the students who choose it did so because they were interested in specialised translation, to improve their science classes in English or because they work

for an international company related to engineering component, as arose in the survey launched at the beginning of the course. It started with 80 students enrolled in its first year, and it has reached a total of 150 in the academic year of 2017-18. It gathers students from different points of Spain and other countries mainly coming from Europe and America. The figure 1 shows how the number of enrolled students has been increasing gradually except for the academic years 2014-15 and 2015-16, which experienced a slight decrease, which might have been due to the initial discontent with the subject. It also includes the number of students which created an account at Wikispaces (first value), at the percentage in relation to the total of students enrolled (fourth value), which represents a measure of 48%. Paradoxically, the year 2015-16 was the year with the highest number of Wikispaces members.

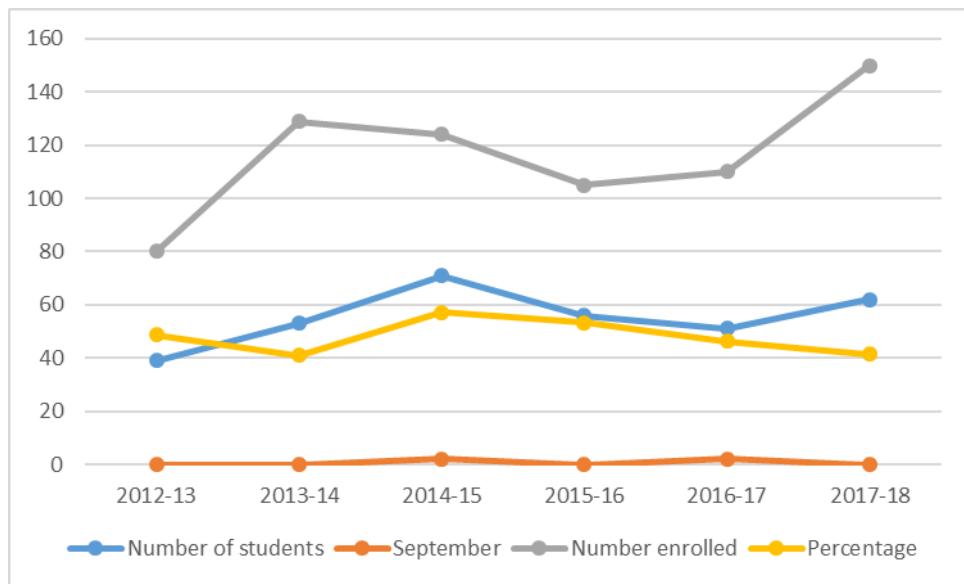


Fig. 1. Overall figures (total of enrolled students & Wikispaces' membership)

This feeling, provoked by a sense of overwhelming at the very beginning of the course, might be the cause of the consequent light students' drop. At the light of these results, the teaching team decided to give more technological support from the beginning, especially for those not familiarised with Wikispaces. The beginning of the academic year 2017-18, which coincided with the closure of this tool, triggered the migration of all the activities found on the wiki to the online course. If at the beginning this meant a significant problem for the collaborative work, some evidence proves that this fact has brought more advantages than expected.

4.1. The wiki

The wiki was created on January 23rd, 2012, some days before the launching of the subject, with Wikispaces, a free tool founded in 2005 when used for educative purposes. Most of the students already knew how to work with it, given that they had followed a subject delivered by the same teaching team with similar methodology. However, 45.9% had not worked with this tool ever, and this fact represents for them a real handicap in the first weeks of the course, being an obstacle more than an element of help to comment the texts.

4.2. Wiki activities

As mentioned before, the wiki has been the support for some of the activities proposed throughout the course. They appear on the online course through a link that points to the page in the wiki that contains it. The structure of the wiki pages is always the same: an editable space where texts are displayed ready to work on, a forum below to discuss questions related to the texts, a history of changes and administration section. Table 1 shows the number of activities found in the wiki in relation to the total of activities found along the course. The brainstorming activities consist on some questions addressed at the beginning and end of each unit to the students to make them share what they know about each topic before its study and final questions as a reflection and feedback about what they have learnt after its study. ‘Others’ are mainly based on the reading of some relevant article with the aims of sharing some relevant findings on the forum and the total displays the number of activities per unit and its measure, more than 6,4 activities per unit, perhaps more than other similar subjects on the same course.

Units	Wiki activities	Brainstorming	Others	Total
Unit 1	2	2	2	6
Unit 2	2	2	2	6
Unit 3	3	2	2	7
Unit 4	3	2	1	6
Unit 5	3	2	2	7
Measure	2,6	2	1,8	6,4

Table 1. The number of wiki activities per unit.

Most of these activities consist of a group of texts which must be annotated with colours to identify the different linguistic features studied in each unit. These editions are tracked by the platform with the name of the user and the date of modification for later analysis. Even though most of the pages were updated with new texts at the beginning of the semester, the students had access to the previous commented versions, so that they can read other annotated samples of texts to revise before the exam. One of the activities included in unit 4 consisted on identifying different parts of the IMRD structure of an article in different abstracts according to Galsman-Deal (2010), who divided them into model 1 or 2 depending on whether they referred to all the sections of the complete article or not (Introduction-Methodology-Results-Discussion). Some of the students preferred to wiki forum to post their answers and some others wrote their analysis after the text, probably because they did not know how to add colours to the text. In the case of 2015-16-year students, the platform registered a total of 14 responses to the wiki forum colour editions from two different students. The same activity in the academic year 2017-18 generated 31 messages in the forum, in opposition to the eight received in 2015-16. One of the most relevant findings in the mentioned year is that they have been able to do basically the same than with Wikispaces, probably due to the homogeneity of working places. The students could also use colours to highlight different parts of the structure of the abstract at the same time they sent their

messages to the right thread. Some of them even discussed other responses and asked about different alternatives, so that the same goal aimed with the wiki has been fulfilled with the aLF forum as well. Similarly to what has happened with this activity -brought from the wiki to the forum, it could be seen in the rest of the activities based on the wiki. New shorter texts were found to be included in the pdf, and the interaction was passed to the thematic fora. From now on the activities will be more accessible because they will be seen easily by students with no Internet connection and others with no previous knowledge in wikis.

4.3. The written exam and its relation to the Continuous Evaluation Test (PEC)

One of the peculiarities of UNED methodology is that all the subjects included in the study plans require to take a face-to-face exam, which represents the most significant proportion of the total marks of the subject. Hence, this written test consists of three parts: the analysis of an EST text, the classification of an abstract by location references to the different parts of a scientific article and the description of a graph.

Apart from the final written exam, Bologna study plans require the realisation of a personal project which can represent up to 20% of the total marks (in the case of UNED). The IPAl's PEC consists of the submission of a portfolio containing all the activities done by each student during the course so that he/she can be evaluated according to the effort involved. This format helps them prepare the exam gradually and in a guided way, instead of being an independent practice added to the face to face test. During the first two years, there were a previous shorter PEC at the end of the unit 1 the help the students remind of the contents of the IPAl and general ESP, but it had to be removed due to the amount of time that had to be employed to do it. These PECs are marked by online tutors, who provide some feedback of help for the students before their exam. The number of students who submitted the PEC corresponds approximately to the number of students who registered at Wikispaces to do the activities. Most of these students go to the first exam call, and most of them pass it.

4.4 Evaluation results

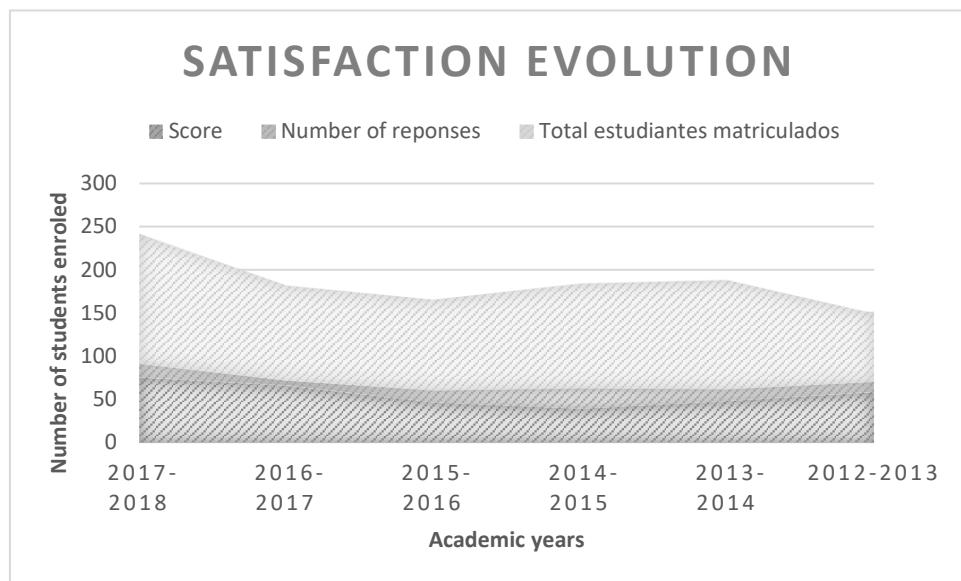
One of the evidence used to prove the efficiency of the wiki has been contrasting its level of interaction compared to the different academic rates. Then, the most successful academic year regarding wiki's membership (table 1) coincides with the year with the best rate of success (2014-15), with 100% of students with the subject passed. However, almost 30% did not take the final exam of the same year. Although it was not the worst year in terms of rate of evaluation, there has been a high number of dropping, most of them had not submitted the PEC.

Items	2017-18	2016-17	2015-16	2014-15	2013-14	2012-13
Rate of evaluation (en %)	77,33	70	66,67	71,9	81,75	81,01
Global results (same grade and type)	71,92	72,45	77,3	80,3	80,81	78,85
Rate of success (%)	97,41	96,1	95,71	100	99,03	96,88
Global results (same grade and type)	95,81	96,61	97,21	97,56	97,82	96,63
Rate of return (%)	75,33	67,27	63,81	71,9	80,95	78,48
Rate of return (% first enrolment)	79,43	68,63	66,67	71,68	80,65	78,48

4.5. Satisfaction results

The following data come from two sources: the official ones, extracted from the UNED quality department, and the several satisfaction questionnaires delivered throughout the course.

Similarly to what happened with other facts, the least successful years in terms of satisfaction corresponds with the central ones. Although these results are not fully feasible due to the low number of responses, a clear improvement can be seen since the worst results obtained, thanks to the improvement actions performed by the teaching team. The best results coincide with the closure of Wikispaces and the simplification of the tools used.



One of the peculiarities of distance studies is the elevated rate on abandonment and return. From the 18 subjects offered for the 4th year, 13 were optional, similarly to the subject analysed in this study. It is important to highlight the fact that this was among the six subjects with the highest rate of evaluation (81,01%), a percentage which has been decreasing until the year 2016-17. This could be caused by the time it takes its global study, including a quite complete PEC which represents 20% of the total score.

Apart from the official questionnaires, other surveys have been delivered at the end of each unit to obtain feedback about the time and their level of satisfaction. A quarter of the respondent affirms to have devoted more than 20 hours of study, which could probably coincide with the students who did the PEC, in opposition to a majority, who stated to have employed less than 20 hours¹. In the case of the third unit², more than 75% declared to have spent more than 20 hours and 100% of the students satisfied with the knowledge acquired in the unit, which represent a considerable improvement.

¹ Form unit 1 <http://tinyurl.com/y9hcgxlm> / Unit 2 Form <http://tinyurl.com/yawssguh>

² Form unit 3 <http://tinyurl.com/y8cavrjk>

The feedback for units 4 & 5 has been extracted from the answers dropped to the forum to the “final questions point of the class notes. One of the students affirmed that “it took him five full days to read and summarise everything and do the activities”. He and other students also commented that this unit, centred on learning how to produce an abstract, helped them to understand the structure of a scientific article, something that they also could apply directly to the elaboration of their final degree assignment (TFG). The unit 5 final questions included one about the whole course. Most of the participants in the forum coincided to catalogue IPAII as a “practical and enjoyable subject” but time-consuming at the same time, which could be a problem for students enrolled in a University like this.

5. CONCLUDING REMARKS

IPAII is indeed a complex subject with a high degree of multidisciplinarity and interaction. Although the interest and motivation have experienced considerable growth in the last years, as the enrolment numbers and satisfaction questionnaires demonstrate, there are many weak points to improve.

The problem on the closing of Wikispaces has helped the teaching team to realise that working collaboratively with a unique tool is also possible. Having more than spaces to attend has obliged the instructors to double their work, resting time to the basic tasks of the course, and making a second effort to explain how to manage with external tools for some students. An additional obstacle came in the academic year 2017-18 when two in prison students enrolled in this course for the first time so that the teaching team had to adapt the online materials into plain ones to be accessed by these students with Internet restrictions.

The fact that the activities can be done individually, without having to edit directly on the Wikispaces activity page, hides part of the work done by the students. This explains the poor activity registered by the changes track. This does not mean that a minority of technology advanced students had seized the advantages of the wiki in the expected manner.

One of the most relevant conclusions of this study reinforces others concluded by other authors mentioned in this study. The key of a wiki-based project like this consists of a well-planned and monitored design, with the presence of the tutor visible at all time. Using a single platform can be a good way to help those not so familiarised with wiki edition so that it can motivate to more students.

REFERENCES

- Acedo Dominguez, G., & Edwards Rokowski, P. (2002). Bridging the gap between English for Academic and Occupational Purposes. *English for Specific Purposes World*, 1(2). Retrieved from [http://www.esp-world.info/Articles_2/Bridging the gap between English for Academic and Occupational Purposes.html](http://www.esp-world.info/Articles_2/Bridging%20the%20gap%20between%20English%20for%20Academic%20and%20Occupational%20Purposes.html)
- Barrios, E., López-Gutiérrez, A., & Lechuga, C. (2016). Facing Challenges in English Medium Instruction through Engaging in an Innovation Project. *Procedia - Social and Behavioral Sciences*, 228(June), 209–214. <https://doi.org/10.1016/j.sbspro.2016.07.031>

- Cutler, A. (2014). Making a Difference in Changing Times – the Value of Research in Challenging Traditional Training Practice and Supporting Collaborative Learning. In A. Rauch, Franz; Schuster, Angela; Stern, Thomas; Pribila, Maria; Townsend (Ed.), *Promoting Change Through Action Research* (pp. 77–85). Rotterdam, The Netherlands: Sense Publishers.
- Drljača Margić, B., & Vodopija-Krstanović, I. (2018). Language development for English-medium instruction: Teachers' perceptions, reflections and learning. *Journal of English for Academic Purposes*, 35, 31–41. <https://doi.org/10.1016/J.JEAP.2018.06.005>
- Ha, A. Y. H., & Hyland, K. (2017). What is technicality? A Technicality Analysis Model for EAP vocabulary. *Journal of English for Academic Purposes*, 28, 35–49. <https://doi.org/10.1016/j.jeap.2017.06.003>
- Haghghi, S. B. (2012). Integrating EAP with EOP: An Eclectic Approach toward the Instruction of Iranian Engineering Undergraduates. *International Education Studies*, 5(9). Retrieved from <http://www.ccsenet.org/journal/index.php/ies/article/view/19128/12661>
- Hamp-Lyons, L., & Hyland, K. (2004). Contrastive Rhetoric in EAP. *Journal of English for Academic Purposes*, 3(4), 271–359. <https://doi.org/10.1016/j.jeap.2004.07.001>
- Hatam, A. H., Shafiei, S., Brieger, N., Pohl, A., Busch-Lauer, I. A., Cho, D. W., ... Zhang, Q. Y. (2009). Technical English and general English--are they really different? *English for Specific Purposes*, 8(2), 1221. <https://doi.org/10.1177/2158244014550610>
- Ivankova, N. V. (2014). *Mixed methods applications in action research : from methods to community action*. SAGE Publications.
- Johns, A. M. (2012). The History of English for Specific Purposes. In S. Starfield & B. Paltridge (Eds.), *Handbook of English for Specific Purposes* (pp. 5–29). Somerset, NJ, USA: Wiley. Retrieved from <http://site.ebrary.com/lib/unedbiblioteca/docDetail.action?docID=10657987&ppg=21>
- Jordano de la Torre, M. (2009). La enseñanza de la ELAO en el contexto de la educación a distancia en las puertas del EEEs: del texto impreso a la web 2.0. In R. Roig Vila (Ed.), *Investigar desde un contexto educativo innovador* (pp. 235–250). Alicante: Marfil.
- Kassem, M. A. M. (2017). Developing Business Writing Skills and Reducing Writing Anxiety of EFL Learners through Wikis. *English Language Teaching*, 10(3), 151. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1132013.pdf>
- Kuteeva, M. (2011).
- Wikis and academic writing: Changing the writer-reader relationship. *English for Specific Purposes*, 30, 44–57. <https://doi.org/10.1016/j.esp.2010.04.007>
- Kuteeva, M., & Mauranen, A. (2018). Digital academic discourse: Texts and contexts: Introduction. *Discourse, Context & Media*, 24, 1–7. <https://doi.org/10.1016/J.DCM.2018.06.001>
- Lin, C. Y., & Reigeluth, C. M. (2016). Scaffolding wiki-supported collaborative learning for small-group projects and whole-class collaborative knowledge building. *Journal of Computer Assisted Learning*, 32(6), 529–547. <https://doi.org/10.1111/jcal.12140>
- Liu, D. (2012). The most frequently-used multi-word constructions in academic written English: A multi-corpus study. *English for Specific Purposes*, 31(1), 25–35. <https://doi.org/10.1016/j.esp.2011.07.002>
- Mudraya, O. (2006). Engineering English: A lexical frequency instructional model. *English for Specific Purposes*, 25(2), 235–256. <https://doi.org/10.1016/j.esp.2005.05.002>
- Murray, R., & Moore, S. (2006). *The handbook of academic writing: a fresh approach*. Milton Keynes, UK: Open University Press.
- Ortiz Navarrete, M., & Ferreira Cabrera, A. (2014). Proposing a Wiki-Based Technique for Collaborative Essay Writing. *PROFILE Issues in Teachers' Professional Development*, 16(2), 185–198. <https://doi.org/10.15446/profile.v16n2.38877>
- Parkinson, J. (2012). English for Science and Technology. In S. Starfield & B. Paltridge (Eds.), *The Handbook of English for Specific Purposes* (pp. 177–196). Somerset, NJ, USA: Wiley-Blackwell. Retrieved from <http://site.ebrary.com/lib/unedbiblioteca/docDetail.action?docID=10657987&ppg=21>
- Parkinson, J., & Adendorff, R. (2004). The use of popular science articles in teaching scientific literacy. *English*

for Specific Purposes, 23(4), 379–396. <https://doi.org/10.1016/j.esp.2003.11.005>

Pérez Llantada, C. (2018). What Scientists Write and How They Write It: A look at Changing Literacy Practices. Córdoba.

Raman, M. (2006). Wiki Technology as A “Free” Collaborative Tool within an Organizational Setting. *Information Systems Management*, 23(4), 59–66. <https://doi.org/10.1201/1078.10580530/46352.23.4.20060901/95114.8>

Roger, & Sergi. (2018). Comunicar la ciencia: El perfil del periodista científico en España | Communicating science: The profile of science journalists in Spain. *Comunicar*, 55(2018), 9–18. <https://doi.org/10.3916/C55-2018-01>

Roy, D. (2017). Task-based EFL language teaching with procedural information design in a technical writing context. *Cogent Education*. <https://doi.org/10.1080/2331186X.2016.1264174>

Rusko, T. (2014). Lexical Features of Scientific Discourse. *Coactivity: Philology*, 22(1), 82–88. <https://doi.org/10.3846/cpe.2014.08>

Suau-Jiménez, Francisca; Ramírez Polo, L. (2016). How to blend Language and ICT in the Didactic of the Scientific. In M. Carrió-Pastor (Ed.), *Technology Implementation in Second Language Teaching and Translation Studies : New Tools, New Approaches*. Springer. https://doi.org/DOI: 10.1007/978-981-10-0572-5_12

Swales, J. M. (1990). *Genre analysis: English in academic and research settings*. Cambridge: Cambridge University Press.

Talaván, N., Jordano de la Torre, M., & Bárcena, E. (2017). The Sustainable Generation of Bilingual Textual Resources for L2 Learning: A Crowd Translation Experience. In *8th International Conference of the Iberian Association of Translation and Interpreting (AIETI8)*. Alcalá de Henares, Madrid. <https://doi.org/10.13140/RG.2.2.13890.58561>

Trimble, L. (1985). *English for science and technology: A discourse approach*. Cambridge University Press Cambridge.

Windsor, A., & Park, S. S. (2014). Designing L2 reading to write tasks in online higher education contexts. *Journal of English for Academic Purposes*, 14, 95–105. <https://doi.org/10.1016/j.jeap.2014.01.003>

Zheng, B., Niiya, M., & Warschauer, M. (2015). Wikis and collaborative learning in higher education. *Technology, Pedagogy and Education*, 24(3), 357–374. <https://doi.org/10.1080/1475939X.2014.948041>

Zou, B., Wang, D., & Xing, M. (2016). Collaborative tasks in Wiki-based environment in EFL learning. *Computer Assisted Language Learning*, 29(5), 1001–1018. <https://doi.org/10.1080/09588221.2015.1121878>