



Effectiveness of task-based training to develop technical academic writing competencies

L'efficacité de l'approche basée sur les tâches pour l'apprentissage des techniques de la rédaction académique

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Abstract : English was introduced into PhD programs to meet students' needs. Yet, it was observed that even after receiving training in ESP, researchers in the fields of science and technology still find language and strategic difficulties to report their research outcomes and publish their scientific papers in English; a case in point, PhD students in the department of mechanical engineering in the University of Ain Temouchent-Algeria. Therefore, to explore the nature of these difficulties two research instruments were used namely a questionnaire and an interview. The analysis of data revealed that PhD students are challenged by language and strategic problems. Hence, an academic writing course relying on task-based approach was experimented and evaluated using a writing test. The results asserted that the suggested course enabled the students to overcome relatively their major difficulties.

Keywords: academic writing, ESP, mechanical engineering, PhD students, task-based approach

Résumé : L'anglais de spécialité a été introduit dans les programmes de doctorat pour répondre aux besoins des apprenants. Néanmoins, il a été observé que même après avoir reçu une formation en ESP, les chercheurs dans les domaines des sciences technologiques font face à des difficultés pour communiquer les résultats de leurs recherches et aussi publier des articles scientifiques en Anglais ; à titre d'exemple, les doctorants du département de génie mécanique de l'Université d'Ain Temouchent- Algérie. Pour explorer la nature de ces difficultés, deux instruments de recherche ont été utilisés, un questionnaire et un entretien. L'analyse des données a révélé que les doctorants sont confrontés à des problèmes linguistiques et stratégiques. Ainsi, un cours de rédaction académique compté sur une approche basée sur la tâche a été expérimenté et évalué à l'aide d'un test d'écriture. Les résultats ont affirmé que le cours proposé a permis aux étudiants de surmonter relativement leurs difficultés majeures.

Mots-clés : rédaction académique, ESP, génie mécanique, doctorants, approche basée sur la tâche



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In today's globalized world, English is regarded as the primary language used for conducting and communicating scientific research. According to Crystal (2003), English is the most widely used language for communication in science. He demonstrates that researchers who intend to produce significant, internationally recognized scientific research works are required to publish their papers in English. Furthermore, they need to share their knowledge with other researchers around the world by participating in international conferences, workshops and seminars in English to gain international visibility and have access to the international scientific community. Cook states that "English is a requirement for scientific writing and reading: Few scientists can make a proper contribution to their field without having access to English, either in person or through the translation of one kind or another" (2008:200). He asserts that mastering English is one of the necessary requirements for scientific reading and writing. In fact, what contributes to the significance of English in science is its cultural neutrality as science conveyed in English is presumed to be socio-culturally neutral (Wierzbicka, 2014).

Therefore, Algerian researchers in general and PhD students in the fields of science and technology in particular need to master English. The latter are required to write academically in English for a variety of reasons related to their research and because English is the language of modern science, important research papers and references in their fields are written in English. This language indeed represents modernization (Koriche, 2022). Pérez-Llantada (2012) claims that English has become the major common language used to communicate scientific research over various contexts and languages. Researchers around the globe are concerned with mastering English to be in line with recent studies and to share their research findings with other researchers around the world as well.

In Algeria, science and technology PhD students need to write various types of academic papers in English such as scientific articles, reports, abstracts for international conferences in order to fulfill the requirements of their PhD studies. Hence, the Algerian universities have become aware of the importance of mastering English for these students and this is the reason why ESP is taught in various disciplines and at different levels in order to fulfill learners' specific needs and prepare them to become better performers in the workplace.

Researchers from various disciplines over the world encounter several challenges in publishing their works in international journals (Ferguson, 2007; McKinley & Rose, 2018). Similarly, despite the fact that Algerian PhD students in the fields of science and technology received an ESP course at the different levels of their university studies, they still struggle with writing academically in English. Thus, they find difficulties to publish their scientific articles in international journals. A case in point, PhD students in the department of mechanical engineering, faculty of sciences and technology in the University of Ain Temouchent. This problematic raised the following research question:

- What kind of training would influence positively PhD students' academic writing competencies?

In order to answer the research question above, the following hypothesis was developed:

- Task-based training would enable PhD students overstep their academic writing challenges and improve their skills.

Hence, this paper aims to evaluate the efficiency of a task-based course intended to enhance Algerian mechanical engineering PhD students' academic writing skills.

1. Literature review

Writing is a communicative and an interactive activity that involves transmitting ideas, facts and knowledge to an audience and engaging in social interaction as well (Harmer, 2004). In this respect, Bello (1997, as cited in Ibnian, 2011) claims that writing is an ongoing process of exploring and learning how to convey thoughts and express emotions in an efficient language. Therefore, considering both the process and the product is necessary for the writer. Badger and White point out "writing involves knowledge about language, knowledge of the context in which writing happens and especially the purpose and skills in using language" (2000:157-158).

Furthermore, Writing is a cognitive activity that incorporates several cognitive processes that assist the writer to generate information and produce it in an organized way (Sinclair, 2010). Based on this idea, writing acts as a problem solving activity whereby the writer considers a writing task as a problem and try to solve it through generating resources. In this respect, the writing process encompasses a set of strategies including "setting goals, generating ideas, organizing information, selecting appropriate language, making a draft, reading and reviewing it, then revising and editing" (Hedge, 2000:392). Nevertheless, focusing on the cognitive side only is not sufficient to generate information. Therefore, it is important to consider the social aspect of writing because the latter "is not an act of an isolated individual but a joint endeavor between writers and readers" (Hyland, 2009:31). All these aspects make writing a challenging skill.

1.1. The product approach to writing

The product approach to writing puts an emphasis on the outcomes of what has been taught (Badger & White, 2000). That is, instead of concentrating on the process that students go through when writing, it focuses on the linguistic knowledge and how language is structured. This approach considers writing "as mainly concerned with knowledge about the structure of language" (Badger & White, 2000:154). It means that students should pay attention to the appropriate use of vocabulary, syntax and cohesive devices. Thus, they are required to imitate models of texts given by the teacher (Hyland, 2016). Thus it is a teacher-centered approach which involves four stages.

The first stage is known as familiarized writing where students use texts to get knowledge about grammar and vocabulary. As its name suggests, this phase helps students to be familiar with the linguistic elements of the text in order to prepare them for writing. The second phase is controlled writing where students put into practice what they have learnt as vocabulary, structures and so forth through different tasks such as matching exercises. In the third stage, guided writing, the students are provided with a model text and are required to imitate it. This is done through a number of guided exercises such as paraphrasing, completion tasks...etc. Free writing is the fourth and the final stage where students are allowed to produce freely based on what they have learnt (Sebbah, 2021). Simply put, this approach considers only the final product i.e. the structure of the text whereas the different stages involved in the process of writing are neglected (Badger & White, 2000).

1.2. The process approach to writing

As opposed to the former approach, the process approach to writing emphasizes the different steps that the writer goes through before reaching the final product. That is to say, rather than stressing linguistic knowledge and taking into consideration only how the text is structured, attention is directed towards the process of writing where various steps are involved such as planning, drafting, editing and revising (Badger & White, 2000).

By undertaking these steps, the writer tends to modify and improve the piece of writing until it reaches its required form (Oshima & Hogue, 2007). This is through the various cognitive operations that the writer engages in. Thus, unlike the former approach, it is a learner-centered approach to teaching writing where the learner is at the center of the writing process. That is to say, he engages in planning for writing and outlining, writing the first draft, revising, editing and proofreading (Ghouali, 2021). This step makes writing a complex process.

1.3. The genre approach to writing

Similar to the product approach to writing, the genre approach supports the linguistic features of writing. However, it focuses on its socio-cultural aspect which was neglected in the former approaches i.e. the product approach and the process approach (Badger & White, 2000). Yang claims that “writing is viewed as a social act” (2014:75) because it consists of various genres, and each genre relies on a social context and a purpose that leads the writing (Ghouali, 2021). Thus, the contexts where writing takes place come to play a significant role in reinforcing the writer’s cognition (Sebbah, 2021). In this respect, Hyland believes that “students not only need help in learning how to write, but also in understanding how texts are shaped by topic, audience, purpose, and cultural norms” (2003:14). The writer in this sense is not isolated. Rather, he is always in an interaction with an audience. More importantly, he seeks to meet his readers’ needs as Nystrand states:

The process of writing is a matter of elaborating text in accord with what the writer can reasonably assume that the reader knows and expects, and the process of reading is a matter of predicting text in accord with what the reader assumes about the writer’s purpose. More fundamentally, each presupposes the sense-making capabilities of the other. As a result, written communication is predicated on what the writer/reader each assumes the other will do/has done. (1989:73)

Simply put, writing from the genre perspective tends to be purposeful. The writer takes into consideration the setting where writing takes place, the audience, the linguistic aspects, and the socio-cultural norms.

1.4. What makes writing academic?

Academic Writing is a significant pattern in the domain of English for Academic purposes. It is a form of writing that facilitates reading and comprehension of the author’s work (Nemouchi, 2019). Writing academically requires the author to follow the conventions of academic writing including for instance, spelling, grammar, and punctuation. According to

Bailey (2006), what makes writing academic is its formality, objectivity, and impersonality. That is, the writer is required to use a formal tone and present ideas in an objective and impersonal way by using, for example, the third person instead of the first-person.

Moreover, academic writing is characterized by its clarity, organization, and precision. It means that the information has to be well structured and organized, presented clearly to the readers i.e. without ambiguity, and the writer has to be precise and concise in choosing his words. Hence, respecting all these rules makes academic writing a challenging task for students to master.

2. Methods

In this study, the researchers opted for a case study research design in order to explore in deep the major challenges encountered in academic writing. The participants were second year PhD students, content teachers and officers in the department of Mechanical Engineering, faculty of sciences and technology at the University of Ain Temouchent.

For the sake of identifying and analyzing PhD students' writing needs and in order to collect reliable data, quantitative and qualitative research instruments were used namely the questionnaire, and the interview. Two different questionnaires including open-ended, closed-ended and mixed questions were distributed online to twenty-two PhD students and nineteen content teachers using google forms. On the other hand, a structured interview was carried out with six officers.

3. Writing needs analysis

The findings showed that the majority of PhD students encounter both language and strategic problems while writing. With regard to language problems, 90.90% of them face difficulties at the level of grammar mainly in using verbs, tenses, pronouns and articles. More than the half encounters problems in selecting the adequate vocabulary to express their ideas. The vast majority of PhD students (81.80%) find difficulties in writing coherently. Moreover, only 9% of them can use cohesive devices appropriately.

As far as the strategic issues are concerned, it was found that PhD students face difficulties in organizing their essays. Nearly 50% of them find obstacles in structuring and developing their ideas in descriptive as well as cause and effect essays. 64% of them face such obstacles in argumentative and compare and contrast essays whereas 77% of them in expository essays. The results revealed also that 64% of PhD students find writing an introduction and conclusion a difficult task to accomplish. More than the half has difficulties in paraphrasing and summarizing. PhD students encounter also problems at the different phases of the writing process mainly pre-writing, drafting, revising and editing. Moreover, nearly half of them face difficulties in arranging a reference list following the required style.

Therefore, these results led the researchers to design a course to fulfill PhD students' linguistic and strategic needs, help them overstep the major difficulties encountered in their academic writing, and enable them to write successfully the different academic papers required in their PhD studies.

4. Experimental course

An academic writing course was experimented on nine second year PhD students in the department of Mechanical Engineering (University of Ain Temouchent). It is based on task-based approach to language teaching and learning. The main aim of selecting this approach is to enable PhD students learn through actively engaging in performing a set of activities or tasks i.e. learning by doing. Therefore, they were provided with a set of tasks to perform. This course attempts to enhance their linguistic and strategic skills. Thus, it is composed of two different units. The first unit includes language activities related to punctuation, linking devices, tenses, passive form, structuring short sentences ...etc. The aim is to address PhD students' language needs. The second unit is devoted to academic writing. Tasks in this unit involve structuring academic paragraphs, essays, articles, abstracts, using sources and avoiding wordiness. The aim is to meet their strategic needs.

The experiment lasted for six months. All lectures were delivered online through Zoom application and each session took three hours per week. Zoom application provides teachers with different teaching tools namely PowerPoint slides, which were utilized in this experiment to deliver the lessons using screen-sharing tool. PhD students were given enough time to perform the activities. Similar to in-class interaction, they were required to have group discussions during the correction of tasks where the teacher was involved as well. Thus, they were allowed to discuss the difficulties they encountered while performing the tasks and ask questions. This helped the instructor to get feedbacks as part of an ongoing assessment.

5. Writing tests

After experimenting the course for twenty-four weeks which involved a total of seventy-two teaching hours, it was important to measure its effectiveness. Thus, a writing test was implemented as a pre-test before starting the course and as a post-test at the end. The test is based on ASSET Writing Skills and IELTS Writing Task 2. i.e. these tests were adopted, adapted, and combined to achieve this aim. Therefore, PhD students were required to perform two different tasks. Task one consists of multiple choice questions whereas task two involves essay writing.

6. Results and discussion

The efficiency of the course was assessed by comparing PhD students' tests results. It was found that in the pre-test, nearly 50% of their choices in task one were incorrect whereas in the post-test, only 22.5% of their answers were false while 77.5% of them were correct. Thus, in task one PhD students received an average score percentage of 50% in the pre-test and 78% in the post-test. On the other hand, their results in task two were assessed in terms of linguistic and strategic competence. Thus, the researchers relied on the criteria discussed below.

The first criterion concerns PhD students' response to the task. In the pre-test, nearly half of them faced difficulties in addressing the task, their position towards the topic was not quite clear, the format was not appropriate, and their ideas were not well developed.

However, the majority of them responded better to the task in the post-test in which they were able to address it as required, their position towards the topic was clear enough, the format was adequate, and the ideas provided were well developed and supported. Thus, in terms of their response to the task, PhD students obtained an average score that represents 42% in the pre-test and an average score that represents 67% in the post-test.

The second criterion is related to coherence and cohesion. In the pre-test, only few PhD students were able to write coherently and to organize their ideas logically. The majority of them did not know how to arrange their paragraphs and how to use cohesive devices appropriately. As opposed to the pre-test, the majority of PhD students succeeded in writing coherent essays with well-organized paragraphs in the post-test. It was noticed also that there was a smooth flow in their ideas. Moreover, cohesive devices were used adequately. Consequently, their average score with regard to coherence and cohesion represents 37, 4% in the pre-test; however, in the post-test, their average score represents 68%.

The third criterion involves PhD students' lexical resource. In the pre-test, nearly half of them used a limited, inadequate, and an inappropriate range of vocabulary with some spelling mistakes. However, a sufficient range of vocabulary and expressions was used in the post-test by more than the half. It was noticed that PhD students improved in terms of vocabulary choice and usage i.e. they used vocabulary appropriately and correctly. Thus, they obtained an average score which represents 44.4% in terms of lexical resource in the pre-test whereas in the post-test, their average score represents 67%.

The fourth criterion concerns grammatical range and accuracy. In the pre-test, nearly half of PhD students used a limited range of structures with errors. Moreover, they made grammatical mistakes and faced difficulties in using punctuation marks correctly. However, it was observed that the majority of them used an adequate range of structures in the post-test including simple and complex sentences. In addition, they made very few errors in grammar and punctuation which did not hinder communication. As a result, they received an average score that represents 43% in terms of grammatical range and accuracy in the pre-test and 65% in the post-test. In task two as a whole, PhD students obtained an average score percentage of 42% in the pre-test and 67% in the post-test.

Therefore, the statistical comparison of the pre-test and the post-test results showed that second year PhD students have made an important and remarkable development in their performance after receiving the academic writing course which was noticeable in their post-test scores. The task- based course provided them with the necessary required skills and competencies that helped them cope with the challenges they encountered at the level of the language and writing strategies.

7. Conclusion

To sum up, the academic writing course experimented on second year mechanical engineering PhD students had a positive impact on their academic writing performance. The outcomes of the post-test were satisfactory compared to those of the pre-test. They asserted that the language and strategic tasks that PhD students performed during the

course played a significant role in improving their linguistic and strategic skills and assisted them in overcoming the main challenges they faced in academic writing.

Furthermore, delivering the lectures online through zoom application was very beneficial in which it allowed for enough time to be allocated to the course whereby PhD students were able to receive more practice in academic writing, which was reflected in their improved performance. Based on these results, the course was proved efficient.

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