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The Significance of English Scientific Writing Proficiency for Publishing Purposes: The Case of Moroccan EFL PhD Students at the Euromed University of Fes

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Abstract

This study aspires to theoretically and empirically investigate the dearth of English scientific writing in the engineering PhD programs at the Euromed University of Fes. It must be noted that the entire absence of English in the curriculum of PhD programs unequivocally creates myriad challenges, mainly in the writing process. Doctoral students find themselves impotent to publish in indexed journals, be it a single-blind peer review or a double-blind peer review, due to the high demands of scientific writing proficiency and accuracy alongside the scrupulous treatment of data. In like manner, novice researchers lack expertise and oftentimes agonize about the writing task as their meta-cognitive skills need to be rejuvenated, revitalized, and rigorously fortified. To that end, the use of numerical data by means of questionnaire is highly estimated by researchers to vigorously help in unveiling the aforementioned challenges, while simultaneously systematically paving the way for context-specific recommendations to be made in order to alleviate some of the pressure that doctoral students undergo with respect to English scientific writing for the purpose of producing quality publishable materials.

Keywords: Scientific writing, Indexed journals, writing across the curriculum, academic research, recommendations

1. Introduction

There is no doubt that scientific writing has increasingly become compulsory and significant among Moroccan EFL PhD engineering students. This significance is inextricably interwoven with thesis and article writing for the purpose of publishing that, directly or indirectly, grants the potentiality of developing individuality of statements as writers based on coherence, precision, and disciplinary knowledge. In fact, scientific writing has become axiomatic when dealing with academic research. For this reason, myriad PhD students attempt to make a quantum leap in the field of scientific writing, yet they find themselves helpless at the publishing level, for the language of publishing in most international indexed journals is English. Under this decisive term, most students resort to online word-for-word translation, which in turn results in various translation errors that entirely distort and obscure the meaning and precision of scientific data. This can potentially diminish the academic and/or scientific value of a given study.

To remedy this nuisance, practitioners and policy makers are demanded to design a curriculum that supports students' needs and feeds their hankerings to learn and enhance their academic writing skills. Nonetheless, it is noteworthy to mention that even native speakers of English are in a state of limbo as they have demonstrated weak scholarly writing performance. According to Ferguson, Pe´rez-Llantada, and Plo "academic writing, or academic literacy, is not part of the native speaker's inheritance: it is acquired rather through lengthy formal education and is far from a universal skill" (2011, p. 42). This implies that native speakers are not in an advantageous situation that makes them scientifically eligible by virtue of their native speaker status. In the same context, Belcher argues that "being an EL [English Language] scholar in a well-resourced setting is certainly no guarantee of eventual publication, nor does being an isolated, off network EIL [English as an International Language] author doom one to rejection. Clearly, authorial agency is far from being a negligible factor" (2007, p. 18). Thus, academic writing is not only limited to non-native speaker academics; even native speaker academics are susceptible to a range of problems, such as research design, coherence and clarity of argument, meaning making, and sentence construction.

As a direct result, meagerness in students' potential to proceed in academic writing arises from the fact that EFL students are not well equipped with the necessary skills that enable them to successfully analyze the print-based information assigned to them, as well as accurately convey informed knowledge to the academic/scientific community. In this sense, it has been avowed that boosting students' reading skills is a prime mover for the advancement of academic writing. Halliday, Yore, and Alvermann (1994) point out that both reading and writing are revitalizing cognitive apparatus that nurture one's reasoning to perfectly analyze, ideally interpret and thoroughly reflect on scientific evidence through a flawless constructive process, "where higher order learning operations are carried out and intellectual "products" (e.g., hypotheses, inferences, generalizations, elaborations, and solutions) are formed" Shawn and Dennis (1994, p. 1060). Thus, reading and writing activities are befitting impetus for stimulating students' creativity and reasoning.

On that account, the current research project comes in response to this ongoing issue, which endeavors to help the aforementioned students with English writing craft. Viewed this way, such a study will attempt to yield firm conclusions about the enhancement of scientific writing, which will positively affect the production and proliferation of scientific and technical knowledge. This will ultimately catalyze the intellectual development of Morocco in different domains. Likewise, this study primarily seeks to investigate the complete absence of English scientific writing in the engineering PhD programs, although it is immensely needed for the purposes of publishing and dissertation writing. In this regard, the Moroccan Minister of Education, Said Amzazi, in January 2019, points out that English cannot replace French as a language of instruction for at least another 10 years because of a lack of teachers. This may account for why English composition is difficult in general, and scientific writing in particular among EFL (English as a Foreign Language) doctoral students.

The rationale behind conducting the current research project purely emanates from the fact that English composition, for most Moroccan PhD engineering students, is onerous and technically demanding because it requires a satisfactory amount of research, reading, thinking, and producing multiple drafts prior to reaching the final product.

It must be noted that the dearth of empirical research on scientific writing among Moroccan PhD engineering students, and more particularly in the TEFL context is the primary motivation for the researchers to conduct this study. Therefore, it is hoped that the current study will respond to a real need of investigation of the issue of scientific writing in the EFL context in doctoral engineering studies. Another motivation for carrying out this study is to discern whether reading scientific and technical texts will affect students' English composition in engineering studies as a whole. There is no doubt, then, that the results of such an investigation will shed some light on the relationship between practicing reading and writing alongside the development of students' scientific composition. To the best of the researchers' knowledge, there is scarcity of recent empirical research studies dealing with the aforementioned issue. In actuality, there are some studies that investigated the relationship between reading, writing frequency, and students' writing ability, such as Heys (1962); Christiansen (1965); De Vries (1970), Bachiri (2017), and many others. These studies yielded different results regarding the effect of reading and writing practice on the development of students' writing ability. Thus, while Heys (1962) found that reading was more effective than writing frequency regarding the development of the learner's writing skill, Christiansen (1965) concluded that there were no significant differences between the two methods. Conversely, Bachiri (2017) confirms that reading actually improves and stimulates students' ability to write more adroitly and adeptly. He believes that reading leads to writing and vice versa.

Taking the above into consideration, more fieldwork is needed to depict a conceptual and empirical framework about the problems that Moroccan EFL PhD engineering students encounter with respect to scientific writing, specifically at the Euromed University of Fes.

This study aspires to achieve the following objectives.

1. To shed light on the significance of scientific writing in the realm of EFL doctoral engineering studies.
2. To advocate the inclusion of scientific writing in the curriculum of doctoral engineering studies.
3. To initiate and encourage scientific writing workshops at the Euromed University of Fes (UEMF) for the sake of enhancing and fostering composition skills among EFL PhD engineering students.
4. To familiarize Moroccan EFL PhD engineering students with writing techniques and skills related to different genres in scientific writing.

As for the research questions, this study revolves around three fundamental ones.

1. What are the perceptions and challenges of Moroccan EFL PhD engineering students toward scientific writing?
2. What are some of the efficacious ways to help improve Moroccan EFL PhD engineering students' scientific writing?

The following hypotheses have been formulated in order to help provide some remedy to the growing scientific writing demands among Moroccan EFL PhD engineering students at the UEMF.

1. The inclusion of scientific writing and research methodology courses in the curriculum will greatly benefit PhD students.
2. Moroccan EFL PhD engineering students need to be familiar with more genres of writing in order to generally understand the nature, dynamics, and processes that govern writing as a whole.

2. Literature Review

According to the literature, scientific writing or scientific research, in the English Academic context, is a systematic process that operates primarily at two fundamental levels, the theoretical and the empirical. The theoretical level is concerned with 'theory-building' research in which a researcher builds on previous concepts and theories about a phenomenon to test, polish, improve and expand those theories and concepts in a more authentic and original way. At the empirical level, oftentimes referred to as deductive level, a researcher is expected to administer some new understandings and proofs vis-à-vis a pre-existed phenomenon to assure potential validity and bona fides of a given scientific study. It is important to emphasize that both the theoretical and empirical levels are equally valuable in writing a research paper. They complement each other, for they are weighed as two inseparable halves of the research cycle and any exclusion of one level or another may turn out the research into an ill-founded and untenable one.

Thereby, scientific writing has never been a child's play as it requires appealing talents in structuring, formulating, phrasing and expressing thoughts with clarity and accuracy. Thus, scientific writing is still considered as a monkey-puzzle tree due to the high standards set by some indexed scholarly journals, especially the most prestigious ones. Ranging from title selection, abstract formulation, and content organization to paper construction, writing a scientific paper compels proficiency, accuracy, and expertise.

In fact, writing is not innate, but a skill that is incrementally acquired through practice and exposure. From this line of argument, Starovoytova argues that "writing is something that is acquired, over-time and with practice, by participating in-research activities and research-dissemination-process". It is considered "as a-generic, cognitive, and individual skill" (2017, p. 2). In this regard, Anderson (2003) points out that scientific writing is *discipline-specific,* in which writing should abide by methods and norms; *evidence-based*, where statements should be based on reliable and valid truths; *balanced and truthful*, in which the writing process should be based on an array of background reading, logical reasoning, accurate data, and valuable sources so as to conform to academic morality and ethicality. Gathering accurate background information and having the required skills and knowledge to transfer what has been stored in mind into a piece of well-founded writing, is paramount in academia. Given this, EFL students should be given more room to be exposed to the writing skill in the EFL classroom. Practice and exposure play a vital role in improving students' writing potency, as well as triggering creativity and ingenuity.

It has almost become a fact that most Moroccan PhD engineering students encounter a plethora of writing difficulties, ranging from form to content, in English. These difficulties potentially stem from the fact that writing is challenging as the student-writer has to invest mental energy and time to fully develop and master this skill. Alsamadani (2010) points out that the difficulty and complexity of academic writing arise from the fact that writing entails discovering a thesis, developing support for it, organizing, revising, and finally editing it to ensure an effective, error-free piece of writing. Similarly, Musa (2010) states that writing is considered as a difficult skill to learn because it includes several components, for instance, grasp on spellings and punctuation, a comprehensive command of grammar, use of appropriate vocabulary, suitable style to meet the readers' expectations and interpersonal skills. The truth of the matter is that learners need to hone various meta-cognitive skills, such as critical thinking, problem-solving, logical reasoning and decision-making, before embarking on the writing process. In this regard, Richards states that "learning to write in either a first, second or foreign language is one of the most difficult tasks that a learner can encounter and one that few people can be said to fully master" (1990, p. 100). This view maintains the idea, which stipulates that the writing process either in first or second language is among the very demanding tasks that every learner may undertake. Irrespective of this fact, little attention has been given to the student's profile, that is to say, the learner's perception of writing, their needs, expectations, and problems, which have not been investigated before deciding on the content to teach writing and its skills. With hindsight, EFL writing receives only little attention from students, teachers, and other TEFL practitioners taking into account the fact that the majority of English teachers complain about the low writing performance of their EFL students even at higher academic levels. The situation in the Moroccan context is nearly the same as that in any other foreign language context.

Meziani (1983) claims that the teaching of writing is dominated by one or two approaches (either the controlled/guided approach, or the product one). The use of these approaches is motivated by the assumption, which states that students can master composition by the process of copying, imitation, and repetition. More importantly, one should mention that the methodology of teaching composition in Moroccan institutions seems to ignore the advances, research findings, and the corresponding recommendations in this area. In truth, it is

quite conspicuous that some Moroccan English teachers are more interested in language correctness than anything else when it comes to composition. This merely means that accuracy (layout and structure) is prioritized whereas fluency (content, intelligibility and coherence) is deprioritized.

According to Mars, "the methodology for teaching writing effectively is an area in which Moroccan teachers receive little or no specific training at all; as a matter of fact, teachers rely on their experience as students and teach composition as they have learnt it through the sentence grammar-oriented approach" (1989, p. 72). Rababah regards the entire issue differently; she "argues that this continuing dissatisfaction with the performance of Moroccan students, as it is the case for all Arab students, is due to a lack of fundamental standards in curriculum design about communicative skills. For them, the low level, which the students' writings are best indicative of, is undoubtedly the reflection of what they were actually taught" (2003, p. 5). This state of affairs calls, therefore, for a serious attempt to investigate the issue of English composition from different perspectives, including the methods and pedagogy adopted.

Like all genres, scientific writing is challenging to Moroccan PhD engineering students. The pressure of indexed journals makes matters worse for the aforementioned students. They find themselves torn between the appropriate use of research methods and writing efficiency. Since indexed journals tend to be highly selective, most PhD engineering students find themselves stuck at the publishing level, especially finding the right journals that have a good impact factor. In this respect, Kirub explains, "most journals receive many more papers than they can possibly publish, and the best journals have high rejection rate. If you are a beginning writer, you stand a better chance of having your paper accepted if you select a less prestigious journal" (2014, p. 19). The rejection is oftentimes by virtue of many factors, such as paper structure, precision and clarity, analysis and interpretation, and plagiarism. To successfully measure up to the expectations of indexed journals, same author (2014, p. 22) highlights the main characteristics of a good scientific paper:

- Present an accurate account of the research investigation
- Be clearly written and easily understood
- Follow the particular style of the scientific discipline
- Be free of jargon and local slang
- Have appropriate and adequate illustrative material
- Not contain any plagiarized material (plagiarism is a serious offence and is a serious charge against an author)

Although these characteristics truly sound relevant and useful, Moroccan EFL PhD engineering students need scientific writing instruction and scholarly guidance to better understand the dynamics of such a genre, and simultaneously receive more familiarity with different paper guidelines and citation methods of known indexed journals. Within this framework, Nerad (2012) believes that "the way doctoral students are taught need to be reviewed in order to prepare an effective generation of researchers" (2012, p. 58). Likewise, Kuh (2008) emphasizes that high quality education tends to involve students through empirical observation, technological breakthrough, and delightful inquiry experiences. In fact, scientific writing has purely been investigated from a linguistic perspective in cursory attempts. However, these studies have neglected the writing processes in which the student-writer goes through in order to generate publishable materials.

- Applied linguists have largely focused on the informational, rhetorical, cross-linguistic and stylistic organization of written texts for descriptive or pedagogic purposes (Hyland, 2000; Swales, 1990)
- Information scientists have focused on the role of texts in the classification, manipulation, retrieval, and dissemination of information (Cronin, 2005)
- Historians, together with several applied linguists, have been interested in the rhetorical evolution of the research article (Salager-Meyer, 1998; Shapin, 1984)
- Sociological studies have sought to explore the interactions between scientists for evidence of the processes which maintain social order (KnorrCetina, 1981).

In scientific writing, being the cornerstone of higher education, writers are required to use less linguistic elegance and more systematic thought development to meaningfully and accurately convey their findings and discoveries in the safest possible ways. This means that language is important, but meaning is more important in writing. It is the sound analysis and interpretation that are the main overarching goal of any academic paper. As Gopen advises "results are substantive, not merely cosmetic: Improving the quality of writing actually improves the quality of thought" (1990, p. 1).

3. Methodology

3.1 Participants

In the present study, the population sample comprised second and third year Moroccan EFL PhD engineering students enrolled at the Euromed University of Fes. The choice of second- and third-year doctoral levels was specifically made by virtue of the fact that they are the levels in which students are in need of scientific writing for publishing purposes. The sample randomly incorporated 21 participants, 13 females and 8 males, making the contribution of females slightly higher than that of males. It must be noted that the gender variable is not taken into account in this study. The participants' age group ranges from 23 to 30 years old. Additionally, their main research areas are process and energy engineering, energy engineering, mechatronic engineering, additive manufacturing, computer science, and chemistry.

3.2 Instrumentation

The choice of the research instrument was the point of departure of data gathering. Given the quantitative nature of this study, a student-based questionnaire, consisting of several sections ranging from perceptions and needs to challenges and recommendations, was randomly sent to PhD students at the UEMF via Google Forms. The questionnaire encompassed 7 close-ended questions and 3 open-ended questions. All the data has been gathered during the first week of June, 2020. In order to abide by the standards of validity and reliability of the questionnaire, there was a pilot test where 5 English teachers were requested to mark the statements and questions that were repeated, unfathomable, or ambiguous, and simultaneously provide feedback about the clarity of instructions, the wording of items, and the accuracy of content.

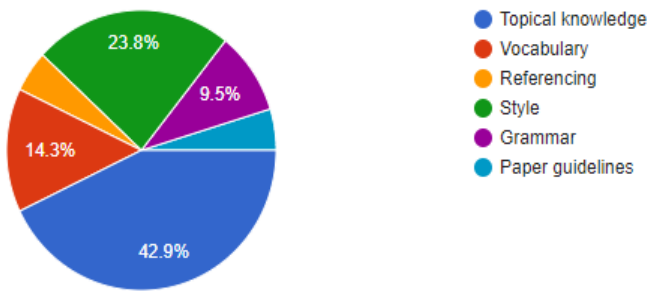

Figure 1. What language components are most demanding?

4. Data Analysis and Discussion

In actuality, the mushrooming production of scientific articles and scholarly books in English has urged numerous educational policy-makers to instantly join forces to enhance scientific writings within the boundaries of the academic setting. However, this state of affairs is far-reaching for many PhD students as it is difficult for most of them to abide by paper guidelines set by indexed journals. In this vein, 42,9% of the participants in the current study demonstrated that one of the emerging problems that they face in English scientific writing is related to the lack of compliance with paper guidelines. Many writers fail to carefully follow the instructions set by the reviewer board, which results in papers' rejection due to inadequate adaptation techniques. For scientific writing to be adequate, writers should not overlook the minor details demanded by the journal editors. Font, size, style, references, paper organization, etc., are all important elements that writers should pay attention to prior to submitting their manuscripts for publication. The more congruous the paper is with journal requirements, the shorter the editorial life cycle may be. This, in turn, leads to maximize the chances for the paper to be accepted for publication in a very short period of time which may give rise to promising opportunities in a growingly competing world. Another major problem with respect to paper guidelines is related to the degree of consistency in using tenses in terms of abstract, review, and data analysis. Writers should be consistent in choosing the right tense, while using reporting verbs and adhere to it all through the whole text. Consistency in following a homogenous spelling of words that are written differently in British and American English, for example, color versus colour, center versus centre, realize versus realise, analyze versus analyse, and so forth, is considered to be another serious problem that may cause distraction and disturbance to the reviewers. Though these are minor issues and may have no effect on the paper content as a whole, still they can reflect a general image of a writer's degree of commitment, organization, and intellectual maturity. On the other hand, 23,8% of the participants have revealed that scientific writing is demanding because of style requirements, especially when it comes to conveying accurate scientific meanings. Students who oftentimes do not have a higher grasp of the English language are more likely to produce ambiguous manuscripts where meaning is awkwardly conveyed. Vocabulary and grammar are other serious problems that EFL students suffer from due to many reasons among which lack of intensive reading and systematic writing programs' dearth is at play. On the ground of this, scientific writing is a challenging task that necessitates abundant trainings and ample practice. In order to vigorously boost the exchange of scientific information, students should receive constant and efficacious writing tutorials and trainings because writing is a skill that has never been innate, but instead taught and acquired.

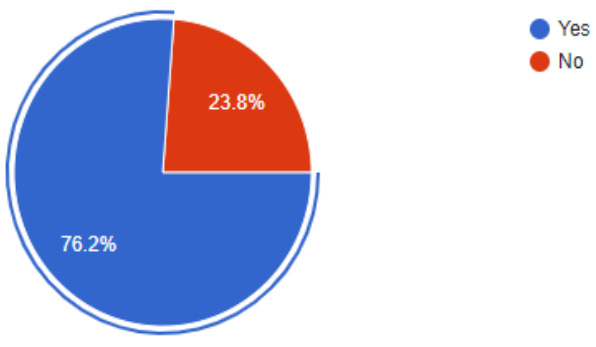

Figure 2. How much is translation used in scientific writing by EFL PhD students?

It is striking from the chart that 76.2% of the participants rely on translation when writing scientifically. This is so because the majority of PhD students received nearly no writing instruction in English throughout their higher education trajectory. English in Morocco rates third after Arabic and French, and it is not taught in primary schools, except for some private institutions. This situation makes the task of writing in English challenging as many students face enormous difficulties in realizing a decent piece of writing. In the context of Moroccan engineering students, writing becomes nightmarish since the majority of students are not qualified enough to write in a language in which they received meager instruction. Engineering students are lacerated between meeting the academic expectations through conducting scientific research and publishing in journals in which English is a prerequisite for being accepted to get the work published. To accomplish this, translation software, applications, and sites are considered to be the sole safe harbor for students to materialize the task. Nonetheless, translation is a process that needs talent, proficiency, and expertise to be appropriately done. Translation entails transferring a range of language characteristics and constituents into another, and since Arabic and English are distant and different languages, imparting elements from Arabic, for example, into English may invoke many structural and semantic problems ranging from sentence construction, word order, to meaning making. Thus, translation is about meaning making and faithfulness to the original text, and not word-for-word or one-to-one literal transformation. Nevertheless, in scientific writing students oftentimes adopt word-for-word translation to convert their texts into English. This operation may upset meaning as it does not take structural incompatibilities, context and style, as well as semantic inconsistencies between languages into account. The result, then, is displeasing and the output is unfavorable as the quality of writing is mediocre, and not meeting the expectations of the publishing board.

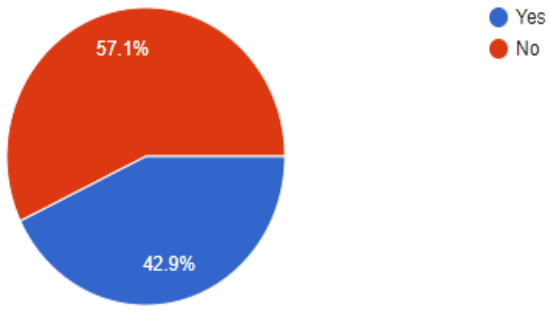

Fig 3. Do editors help Moroccan EFL PhD students with their manuscripts?

It is remarkable that 42.9% of the participants responded in the affirmative, whereas 57.1% responded in the negative. This mixed reply is expressive of a few possible readings. First of all, in Morocco it is unlikely to find certified scientific editors in English, or when found the editing fees can be costly for some PhD students. This reason can be discouraging as numerous PhD students do not know who to turn to for editing, and whether the remarks received from the editors will be helpful and relevant enough to improve the quality of their papers, especially when editors are not domain experts. For the 42.9%, it can potentially suggest that since the majority of PhD students encounter a lot of writing difficulties due to the dearth of academic writing classes in PhD programs at the UEMF, they oftentimes resort to specialists and non-specialists for editing by virtue of the pressure they go through at the publishing level in order to satisfy the requirements of doctoral studies. Publishing at least one article in an indexed journal will be one step forward toward graduation.

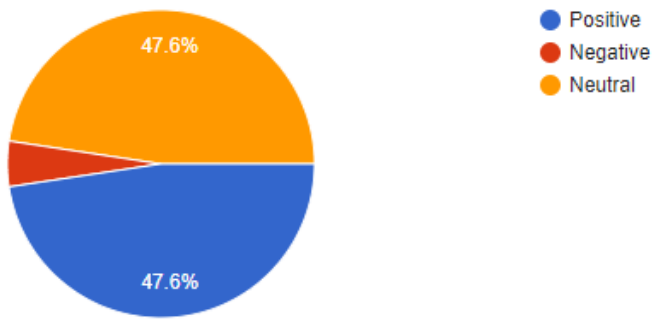

Figure 4. Scientific writing experience

As shown on the chart, participants attempted to display neutrality and positivity toward scientific writing. This is due to students' minimal exposure to scientific writing as the majority of them have undergone little or no contact with academic writing to the extent that they do not even know how to assess their scientific writing record. Nonetheless, reality is far away from this. The analysis of students' responses, with regard to their perceptions of scientific writing and the approaches they adopt to realize the writing task, proved that they de facto face difficulties when writing scientifically, especially when they have to conform to double-blind peer reviewed journals' guidelines. One should know that scientific writing is a daunting task as it requires eminent potency to pertinently and accurately weave ideas, analyze data, relate, and interlink evidence in a way that is conformable to the journal's guidelines and code of ethics. For this reason, scientific writing courses should be given more considerable attention and vigilance by education stakeholders, for they are the birthplace of any effective and worthwhile scientific output. Beyond the shadow of a doubt, constant practice of scientific writing provides researchers with the skills and competencies required for carrier advancement and expertise encroachment. Through writing, students' research habit of analysis is broadened and their scientific knowledge is expanded in the sense that it allows them to become prominent researchers whose competence and proficiency are highly estimated in the ongoing, ever-grinning scientific endeavors. To that end, scientific writing is a valuable mechanism that needs to be instantly strengthened to foster students' skills, talents, and versatility.

Question 1: Would you recommend a scientific writing course in doctoral studies at the UEMF?

This question has been one of the most important questions in this study. It was meant to disclose students' disposition and willingness toward scientific writing at the UEMF. All the answers received from participants are positive and they show a great deal of interest in this particular course of study, namely scientific writing. In fact, since there is an entire absence of scientific writing in Moroccan PhD programs in general, and the UEMF in particular, this course will be tantamount to a springboard to innumerable gains that will eventually be conducive to students' writing development in their research area. Moreover, this course will mainly highlight the differences between scientific writing and other genres of writing, including rhetoric, which is an inseparable element of scientific writing, as it were. In the same vein, it will help students improve discipline-specific vocabulary, and be exposed to various grammar structures, while learning the best practices when writing accurate and substantive research results. This will help them clearly and accurately simplify and account for convoluted concepts and thoughts to profoundly enhance their authorship among reviewers and other readers. Such writing development will not obviously happen overnight as scientific writing requires more practice and learning by trial and error.

To get more chances to publish scientific papers, PhD students are required to triumphantly optimize their style with more practice and reading, correctly use scientific vocabulary, have a sufficient reservoir of topical knowledge, and follow the guidelines of the journal to which they wish to apply. More importantly, the scientific writing course will motivate them to participate in international conferences due to the importance of English, and seek future research collaboration and institutional partnerships. Moreover, this course will lay the foundation for hands-on writing sessions, which will incrementally improve the structure and quality of students' papers as these two main elements seem to be challenging according to participants. In so doing, this will embolden students to be both more productive at the publishing level, and actively immersed in research.

Question 2: What other recommendations would you like to make as a PhD student at the UEMF?

The main impetus behind the inclusion of this question was to ferret out the main needs of PhD students at the UEMF. According to them, these needs vary from scientific writing, research methodology, to public speaking. In effect, these repeated responses clearly manifest students' receptiveness to lever up and catalyze research at the UEMF. Their disposition and predilection in enhancing the quality of scientific writing are palpably indicative of their research commitment and immersion. Similarly, there were other recommendations, such as creating a committee inside the UEMF for reviewing papers before finally submitting them to journals. This way, students whose linguistic performance in English is vulnerable can actually get feedback and remarks about haziness, inaccuracy, ambiguity and tautology that may distract the intended meaning of a given authorship. Such feedback and remarks will be useful to PhD students at a large scale. Within the same context, there should be online workshops and webinars on scientific writing given our current circumstances, COVID-19. A good command of English combined with familiarity of scientific writing can be adequately sufficient to allow students to gradually develop their own skills as their experience in scientific research progresses. More importantly, the course sessions on scientific writing ought to be specific and dependent on the discipline and research topic the student-researcher works on. In this regard, optional English courses can be useful to PhD students as they will be studying the four language skills simultaneously, which can ultimately bring about benefits at the level of language production, be it spoken or written. Creating partnerships with language institutes, such as the American Language Center and/or the British Council can also help students choose the courses they would like to attend and/or entirely focus on language areas they find elusive, such as discipline-specific vocabulary, syntax, transitions, and so forth.

5. Conclusion

This study essentially endeavored to investigate the scarceness of scientific writing in the PhD programs at the UEMF. It also sought to come up with context-specific recommendations in order to assist the aforementioned students through enhancing their scientific writing in the publishing process. The findings have been significant to this study as the majority of the research sample reported that they face ongoing writing problems, particularly with regard to scientific vocabulary, sentence construction, paper guidelines, style, coherence and cohesion, along with topical knowledge. In the same vein, the findings revealed that there are growing demands for scientific writing and research methodology. These two main areas will tremendously contribute to students' intellectual growth, and hence serve as a vector for knowledge discovery and proliferation in Morocco as a whole.

In actuality, the major objective behind conducting this research was not to generate statistics and provide data about scientific writing amid the UEMF engineering PhD students, but rather to floodlight on various challenges and constraints that face engineering students when approaching scientific writing. The study proved that little experience in writing makes students tattered between writing appropriately and displaying scientific findings reasonably without violating the conventions and standards of academic writing. To remedy this, writing courses should be at students' disposal throughout the years of their doctoral studies. Thus, practice and exposure are the

solution to this disturbing issue as a plethora of students lack the required experience and expertise to effectively produce quality publishable materials. This matter is inevitably exacerbated, especially within non-native speaking contexts when students find themselves tuckered out from shouldering the burden of writing in a language they perceive as merely foreign.

The current paper strived, through paying thorough attention to data analysis and findings, to bring to light the major problems that PhD engineering students encounter in scientific writing. This task is justified to be one of the most demanding undertaking that necessitates training, practice, self-confidence, time, patience, mental energy, and the sound use of meta-cognitive skills. Such ingredients undeniably enable the student-writer to sculpt their talent and carve their professional carrier in an ever-evolving scientific community. Successful academic writers are the ones that show commitment, integrity, motivation, and enthusiasm for scientific writing. Nevertheless, one should not discard the importance of cultivating the culture of writing amidst students at an early educational stage so as to fruitfully harvest crops and productively contribute to the development of science and engineering as a whole.

5.1 Recommendations

The recommendations below were purely inspired and meticulously drawn from the extensive study that was carried out throughout the current research project at the Euromed University of Fes.

- There should be a scientific writing course in all the PhD programs at the UEMF. This course will help students understand the underpinning foundation of scientific writing.
- Students should be exposed to more spoken and written forms of English.
- Organizing a committee at the UEMF for an initial review of scientific papers is strongly recommended.
- Having a writing program and/or center will mitigate the linguistic stress that students go through, mainly with respect to dissertation and manuscript writing.
- Scientific writing prioritizes precision and deprioritizes elegance.
- Students should bear in mind that writing is always with an editing process in the end.
- Practicing regularly writing steps (planning, generating ideas, analyzing, synthesizing, and revising).
- The shorter the sentences are, the better and clearer they sound.
- Reading more about one's research area will greatly help in the writing process. Ideas' form meaning, and the latter is important in scientific writing.
- Title, abstract, and conclusion should be carefully written.
- Accuracy, simplicity, elaboration, and coherence are crucial elements of scientific writing.
- Facts are more significant than emotions (bias).
- Novice researchers should choose less prestigious journals so as to avoid paper rejection.
- Understanding author and paper guidelines are the springboard to publishing.
- Daily reading and writing practice is paramount.
- Free writing is proven to boost the writers' incentive and motivation to write.
- Best writing outputs spring from an intrinsic motivation to write, and not merely for the purpose of publishing.
- Successful writers are risk-takers; they take the risk of writing, and hence learn from their mistakes. This ipso facto leads to a gradual enhancement of their writing techniques.
- Writing requires the affective dimension. Encouragement is always good from mentors.

Bio Notes:

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