

Original Research

Knowledge Transfer and Academic Writing: English Writing Errors in Medical Writing of Iranian Authors

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Abstract

A lower frequency of writing errors facilitates the process of knowledge transfer. In this study, we scrutinized the medical journals highlighting the most frequent and critical writing errors in published medical papers of Iranian English journals. As a sample, 25 published articles were randomly selected from recent issues of five Iranian medical English ISI journals (2019). The frequency of discourse, lexical, grammatical, and mechanical errors was identified. In all five journals, more than 50% of errors are related to grammatical errors. The highest frequency of grammatical errors was in articles (79%), and the singular/plural errors had the lowest frequency in this category. Of Mechanical errors, the highest and the lowest errors were assigned to comma usage (25%) and spacing (5%), respectively. The discourse errors had the third position of error frequency among the journals (7.8%). Also, the lexical portion was without error in these journals. Moreover, there is a statistically significant relationship between the impact factors of journals and Grammatical errors ($P < 0.001$). Statistically, no significant relationship was observed between Mechanical errors and the impact factors of journals ($P = 0.57$). The highest error frequency among the main sections of articles (introduction, method, result, discussion) was in the discussion section (42.6%), and the lowest error frequency was in the result section (15%). These shortages arose from the difference between the grammars of two languages (native and target language) and the unfamiliarity of academic authors from these linguistic points. Adequate language proficiency and proper use of grammar could help the authors to transfer their knowledge efficiently. The findings of this study can help minimize some language-related difficulties in writing scientific papers in all fields of study.

Keywords: Knowledge Transfer, Academic Writing, Grammatical Errors, Iranian Authors

Introduction

Extending the learned materials from one context to the others is vital in all learning areas (Nelms, Dively, 2007). Although learning is crucial for transfer, the goals of education cannot be achieved unless transfer occurs. Learning does not happen inside a person who carries it from one context to another, but it happens in the steady relationship between the individual and the occupied system (Boone, Chaney, Compton, Donahue & Gocsik, 2012). Considering the rapid pace of research in Iran, researchers and research managers have recognized an emerging recognition of Knowledge Transfer importance.

Knowledge Transfer (KT) is a dynamic and interactive process that refers to sharing or transferring knowledge and providing inputs to problem-solving. One group is affected by the experience of others (Argote, Ingram, 2000). Therefore, universities were looking for ways to improve the KT of their research findings; however, according to previous publications, these measures were not organized or integrated (Majdzadeh, Nedjat, Fotouhi & Malekafzali, 2009). Two kinds of KT mechanisms have been noticed in practice: Personalization and Codification (ibid, 2009). Personalization refers to the one-to-one transfer of explicit and intellectual knowledge between academia and the non-academic community. Otherwise, codification pinpoints converting implicit or tacit knowledge into knowledge artifacts such as documents, images, and videos consumed by the knowledge recipients asynchronously (Hansen, Nohria & Tierney, 1999). Codification is used to transfer knowledge to a large number of people and results in better knowledge reuse. Explicit knowledge is easy to write down, articulate, and transfer but implicit knowledge is gained from personal experience and is difficult to transfer (Erçetin & Alptekin, 2013). This two-way exchanging element of KT is at the heart of successful and sustainable collaboration (Sudhindra, Ganesh & Arshinder, 2017). Knowledge transfer occurs more accurately through writing than discussion. It means that speaking is not as effective as writing in facilitating the knowledge transfer process (Linton, Pangle, Wyatt, Powell & Sherwood, 2014).

Writing is an essential skill, among other language skills that students should master at school and after it to be able to communicate well with professors (Klimova, 2012). It is a thinking tool through which authors can transfer their knowledge and ideas to readers through a text (Al-Tamimi, 2018). Academic writing is commonly defined as 'scientific writing,' characterized as 'structured research' practiced and used by researchers at higher education levels (Sajid & Siddiqui, 2015). The limitation of linguistic knowledge and language competence negatively affects writing proficiency and foreign language writing quality. Enhancing English language proficiency, especially academic writing ability at the postgraduate level, is the precondition to promote and extend research work (ibid, 2015). Transferring knowledge through writing creates a communication network between the author and the reader. Committing different writing errors in academic articles highlights the authors' partial and inadequate writing knowledge (Alsied, Ibrahim & Pathan, 2018).

Writing errors were categorized into grammatical errors, syntactic errors, and content errors (Sun & Shang, 2009). Errors can also be classified into macro (grammar, lexis, phonology, and semantic) and micro errors (tense, word, spelling, capitalization, articles, punctuation) (Althobaiti, 2014). The most important aspect of second and foreign language learning is error analysis (Jabeen, Kazemian & Mustafai, 2015). It helps educators comprehend the language learning process and highlights the errors learners make to know the deficiency (Singh, Singh, Razak & Ravinthar, 2017). Error analysis pinpoints the effect of mother tongue on errors and

considers universal strategies of different native languages during language learning (Salehi, Bahrami & Groth, 2018). For authors, errors can be originated from their low-level language proficiency and provide evidence on how familiar the authors are with the English language (Sermsook, Liamnimitr & Pochakorn, 2017). Scholars have noticed that errors are helpful because their weaknesses in transferring data by academic writing can be identified (Alsied et al., 2018).

Among non-native authors, writing in English as a foreign language has increased in recent years. They have to consider issues, such as content, organization, purpose, audience, vocabulary and using correct grammar, punctuation, spelling, and capitalization (Al-Tamimi, 2018). As a lingua-franca in science, English is used as a foreign language for most non-native English researchers. All internal journals that publish English language articles require the authors to get a native-like English expert to check their manuscripts. In countries like Iran with low access to English native speakers, proofreading the manuscripts is done by a field specialist or English experts. Therefore, the low English proficiency of Iranians creates a common problem in writing scientific papers that the writers cannot correctly convey their knowledge to the reader by committing different linguistic errors. Also, they have problems translating scientific texts into English. Various studies have been conducted on writing errors in many fields of studies in Iran. However, no study has been conducted on the relationship between knowledge transfer and writing errors among authors in medicine. Therefore, this review study explored the frequent language-related errors in published articles written in English by Iranian medical authors as a barrier to knowledge transfer in this field of study.

Research Question

The following research questions were raised to be answered by the researchers:

What are the most common writing errors within the published medical English articles which hinder knowledge transfer?

Which sections of articles do have more linguistic errors?

Is there any relationship between the journals' impact factor and their qualities?

Methodology

In this study, 25 full-text and original published medical articles (clinical and basic sciences) were selected from recent issues in 2019 from five ISI internal journals (as most of the Iranian research articles were published in these journals). First, purposefully full-text and original articles were selected from the journals. Then, randomly five articles were chosen to be analyzed. The significance of sharing novel medical knowledge among medical society was the reason for our focus on the medical field. To have strong and weak journals, an impact factor greater and lower than one was considered significant in selecting the medical journals. Also, 15-20 articles were published in each issue of the journals. With a maximum of 20 articles per issue, the total numbers of articles were 100 in five journals. According to an error rate of 65.6% in writing (Oermann et al., 2018) and by using the estimation of sample size for one-sample proportion, for detecting a different proportion of 0.2, (confidence interval (CI) of 95% and power of 80%), the minimum required sample size, 25 articles were calculated for review by Stata software. For ethical reasons, the identity of the authors, the articles, and the journals remained anonymous. The Ethics Committee approved the study protocol of the Urmia Medical Science University with the number: IR.UMSU.REC.1398.199.

The frequency of discourse, lexical, grammatical, and mechanical errors was investigated by three authors (two experts in epidemiology and one in English Language teaching). All sections of articles (abstract, introduction, method, result, discussion, and conclusion) were reviewed to highlight the frequency of errors. The quality of articles was categorized as poor (number of errors ≥ 50), average (number of errors between 25-50), and excellent (number of errors < 25).

Data Analysis

All the values were reported as frequency (percent). Data were analyzed with descriptive statistics using Stata software. The Chi-square test was used to measure the correlation between the impact factor of journals and the type of errors, and $P < 0.5$ was considered significant.

Data categorization

four main categories of English language were initially selected (i.e., discourse, lexical, grammatical, and mechanical) to scrutinize the published articles and highlight a different portion of linguistic errors. A brief explanation of each category is given in Table 1.

Table 1

Language-related categories of errors

Categories	Definition
Grammatical	Errors that deal with tense, use of prepositions, use of articles, and singular/plural
Mechanical	Formatting or cosmetic errors without changing the meaning
Discourse	Errors that deal with text, not a word or sentential level, and relate to coherence, cohesion, and meaningfulness of whole text
Lexical	Errors of vocabulary

Results

The present study results can help pinpoint the Iranian authors' weaknesses in exactly transferring their findings to the readers by writing academic articles. A total of 25 original research articles were evaluated. All articles indicated a variety of errors in different portions of articles. The frequency of each error type is presented in Figures 2 and 3.

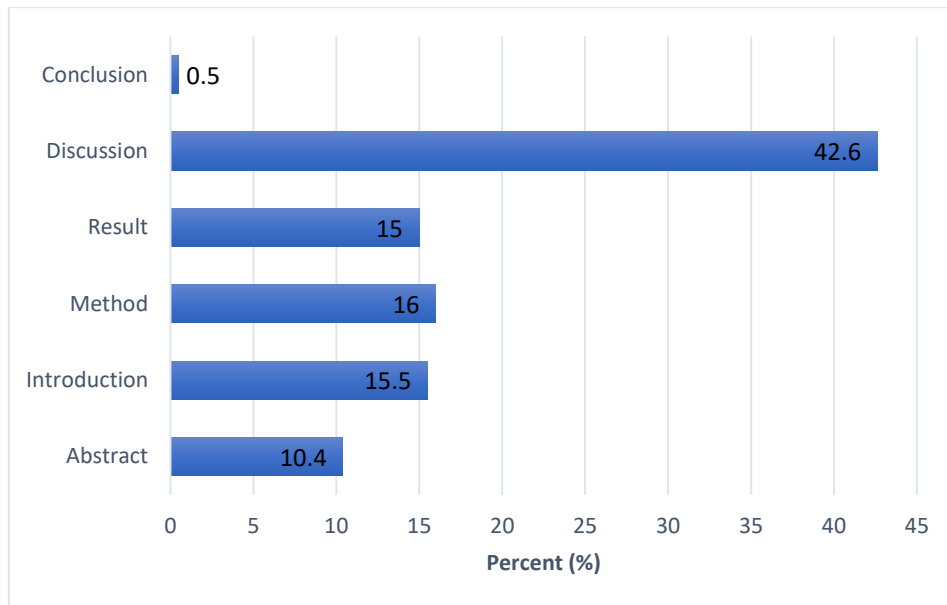


Figure 1: Errors percent in journals sections

As shown in Figure 1, the highest error frequency among the main sections of articles (introduction, method, result, discussion) was in the discussion section (42.6%), and the lowest error frequency was in the result section (15%). For each article reviewed, the research team rated its overall quality. According to this assessment, 8 % of the articles were rated as poor, 32% were rated as average, and 60% were excellent.

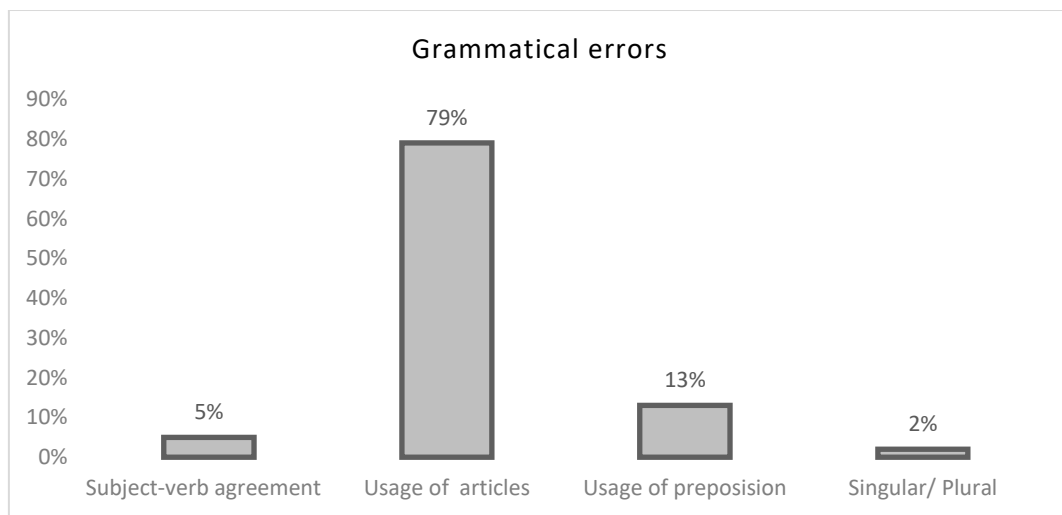


Figure 2: The frequency of Grammatical errors in five journals

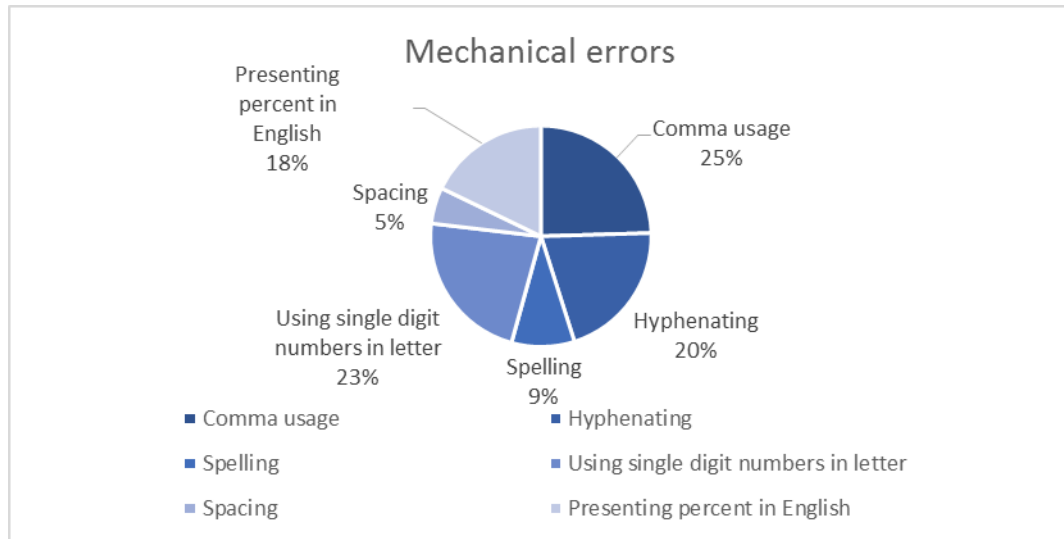


Figure 3: The frequency of Mechanical errors in five journals

According to the results of Figure 2, more than 50% of errors are related to grammatical errors. The higher frequency of grammatical errors was in the area of article usage (79%). The singular/plural errors had the lowest frequency in this category. Of Mechanical errors, the highest and the lowest errors were assigned to comma usage (25%) and spacing (5%), respectively (Figure 3). The discourse errors had the third position of error frequency among the journals (7.8%). Also, the lexical portion was without error in these journals.

Table 2

The frequency of grammatical errors according to journals impact factors

	Journal 1 (*IF=0.75)	Journal 2 (IF=1.254)	Journal 3 (IF=0.786)	Journal 4 (IF=1.514)	Journal 5 (IF=1.05)	Total	P_Value
Errors type	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)	
Grammatical errors							<0.001
Subject-verb agreement	2(9.5)	6 (28.5)	6 (28.5)	3(14.2)	4(19.0)	21(100)	
Usage of articles	62(18.8)	79(24.01)	11(3.3)	146(44.3)	31(9.4)	329(100)	
Usage of prepositions	5(9.2)	12(22.2)	13(24.07)	18(33.3)	6(11.1)	54(100)	
Singular/plural	5(45.4)	2(18.1)	2(18.1)	2(18.1)	0	11(100)	
Total	74(17.8)	99(23.8)	32(7.7)	169(40.7)	41(9.8)	415(100)	

*: Impact Factor

As the results of Table 2 present, there is a statistically significant relationship between the impact factors of journals and grammatical errors. For example, the article usage errors were more frequent in the journal with an impact factor of 1.5 (44%) than in the journal with an impact factor of 0.7 (3%). Furthermore, the frequency of singular/plural errors was high in journals with an impact factor lower than one compared to the journal's impact factor greater

than one (IF=0.75, 45.4 & IF=1.5, 18.1) (Table 2).

Table 3

The frequency of Mechanical errors according to journals' impact factors

		Journal 1 (*IF=0.75)	Journal 2 (IF=1.254)	Journal 3 (IF=0.786)	Journal 4 (IF=1.514)	Journal 5 (IF=1.05)	Total	P_ Value
	Errors type	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)	
	Comma usage	6(16.2)	4(10.8)	7(18.9)	14(37.8)	6(16.2)	37(100)	
Mechanical errors	hyphenating	3(9.6)	14(45.1)	4(12.9)	7(22.5)	3(9.6)	31(100)	0.57
	spelling	0	4(28.5)	1(7.1)	7(5.0)	2(14.2)	14(100)	
	Using single digit numbers in letter	6(17.6)	9(26.4)	4(11.7)	12(35.2)	3(8.8)	34(100)	
	spacing	2(25.0)	2(25.0)	1(12.5)	2(25.0)	1(12.5)	8(100)	
	Presenting percent in English	5(18.5)	8(29.6)	1(3.7)	10(37.04)	3(11.1)	27(100)	
	Total	22(14.5)	41(27.1)	18(11.9)	52(34.4)	18(11.9)	151(100)	

*: Impact Factor

According to the results of Table 3, statistically, no significant relationship was observed between Mechanical errors and the impact factors of journals ($P = 0.57$). However, as observed in the table, most journals with high impact factors have more frequent errors than the journals with lower impact factors. For example, percent errors were 37.04% in the journal with impact factor 1.5 and 18.5% in the journal with impact factor 0.75 (Table 3).

Discussion

All of the three questions were answered in this study. This study revealed that the highest error frequency was in the discussion sections of articles and the lowest error frequency was in the result section. These results are consistent with a study conducted on 28 original articles to highlight English grammatical errors. They reported that the most frequent grammatical errors occurred in the discussion section of the articles (Aziz, Kashif & Aijaz, 2016). Furthermore, Ebrahimi and Heng (2018) reported that the result and discussion sections are the most challenging sections in writing academic research articles, where non-native authors may commit more linguistic errors. Accordingly, the discussion section presents a transfer of significant knowledge that resulted from analyzing the gained data during a study (Jalilifar, 2009).

This study showed that the most prevalent writing errors among Iranian medical writers were dedicated to grammatical errors. In contrast, lexical errors do not have any error frequency among papers. The results generally indicate that although writers have good proficiency in choosing the appropriate words to transfer their knowledge, the difference between their native and English language hinders writing academic papers accurately. According to Bennui (2016), the impact of native language elements on non-native authors' academic writing in the English

language is highlighted in three aspects: grammatical structures, vocabulary items, and discourse. Scientific writing in every language has its mannerism. Being able to write in correct English is a good challenge for a writer. Accurately and effectively transferring knowledge, process, and findings according to readers' expectations are the primary skills in scientific writing (Shah, Shah & Pietrobon, 2009). For transferring data, most writers first convert their thought from their native language to English and then write on the paper, which creates ambiguity in the article. For clarifying the papers, the English language experts should revise them, which is not an easy task (Ariyanti, 2016).

Misusing articles (a, an, the) had the highest frequency among other parts of language accounted for more than half of the errors. These findings agree with those of Salehi and et al. (2018). They performed a study about error analysis of papers written by Persian authors, demonstrating that articles are problematic areas in writing papers because of the contrast between Persian and English articles (ibid). This result is also in the same line with the study conducted in 2013, which revealed that the highest frequency of grammatical errors in published medical articles was found in the usage of articles (Kasperavičienė & Motiejūnienė, 2013). It may be due to the lack of understanding and critical review of the manuscripts before submission and dependence on the native language. There are fundamental differences between the Persian and English languages in the case of using articles. There is no need to use an article before known subjects and the plural form of the nouns in Persian. Furthermore, the Persian language does not have vowel sound words. The equivalent of /a/ and /an/ in Persian is /i/, which acts as a suffix and is added to the noun. In the noun kif (bag) → kif i → (a bag), /i/ is used with all nouns in Persian, whereas /a/ and /an/ has specific positions in English. /A/ always precedes a noun beginning with a consonant, and /an/ precedes a noun used with a vowel. Such differences are significant barriers for Persian writers to convey their knowledge correctly. These findings conform to Sawalmeh's study (2013), which demonstrated ten categories of common language errors that article misusing had the highest frequency.

The second and third common errors which had a high incidence were Mechanical and Discourse errors, respectively. These errors also refer back to the differences between writers' mother tongue and target language. (Jabeen, et al., 2015). For instance, Zheng and Park (2013) conducted a study on analyzing the errors of English academic essays written by Chinese and Korean authors. According to their findings, there were different kinds of errors made by these two groups of writers. Comma usage, punctuation marks, and ordering words had the highest frequency of errors, respectively. Zheng and Park (2013) said that the negative transfer of the writers' native language was the main reason for the errors. In agreement with this study, Lui and Xu (2013) researched error analysis of English writing of Chinese learners. It was found that the sources of errors made by learners were carelessness and the negative effect of learners' native language. In the subject of first language interference, the terms cross-linguistic and language transfer are about the impact of native language structures on learners' performance and progress in learning the target language (Bennui, 2016). This result agrees with Tamami's study, which showed that the mother tongue and target language interference, which was described as negative transfer, cause writing errors (Al-Tamimi, 2018). In this regard, in their study conducted in 2018, Bai and Qin (2018) showed that the negative transfer occurs due to different grammatical forms of both native and target languages. Moreover, Watcharapunyawong and Usaha (2013) conducted a study about the language errors made by the authors in writing English papers, which were the result of the interference of the first

language. Their findings also showed that the students' mother tongue had a strong influence on their writing.

Moreover, plural or singular forms of nouns, subject-verb agreement, spacing, spelling, usage of prepositions, percentage presenting, hyphenating, and using single-digit numbers in letters have less frequent errors in the analyzed articles. In the same line with these results, Al Murshidi (2014) in a similar study, reported that subject-verb agreement and misusing of prepositions were the most frequent errors committed by male students in academic paper writing from different colleges in the United Arab Emirates University. Similarly, Khansir (2013) compared ESL (Indian students) and EFL (Iranian students) students in writing academic papers, in which the number of Iranian students' errors (EFL) was more than Indian students' errors (ESL). These errors resulted from the fact that the EFL learners did not understand the rules of grammatical points very well. The authors need to understand the language requirements of the readers, and the manuscripts should follow the specific guidelines and language requirements of the journal, too.

According to another part of the results presented in this study, there was a difference between the frequency of grammatical errors and the journals with different impact factors. According to the scientometric analysis of research papers, publishing articles in high-rank academic journals (with a high impact factor) is a good indicator of the quality of research articles that confirms the findings of our study. (Mingers & Leydesdorff, 2015). The presented findings are in contrast with the scientometric analysis. This study showed that having a high impact factor does not indicate high quality in the journals. In the same line with his study, Law and li (2015) demonstrated that journal quality could not be judged solely by impact factor; it is much more associated with features like originality, validity, and others. Similarly, Jarwal, Brion, King (2009) suggest that bibliometric metrics, particularly journal impact factors, are not vital instruments for assessing research quality.

First and foremost, the authors should work on grammatical errors, which have the highest error frequency in writing academic papers. Secondly, syllabus designers should devise the books by which the writers meet their specific academic writing needs. Furthermore, the manuscripts should follow the specific guidelines and language requirements of the submitted journal. The authors must carefully read the information in instruction for the author section in the related journals and keep themselves well within limits suggested by the journal. Afterward, they should review their writing carefully and eliminate all the linguistic-related errors to transfer the intended data entirely and precisely to the readers. After submitting the papers by authors, the editorial board of every journal should carefully scrutinize the submitted articles before publishing. Every journal should have an English expert as a member of its editorial board to identify linguistic-related errors and notify the authors to correct them before publication. Unfortunately, as investigated in the editorial board of these journals, they do not have any English experts on their editorial board. Although writing has been considered the most essential and challenging language learning skill, it is feasible for English writers to enhance writing accuracy for better knowledge transfer.

Conclusion

The present study revealed that the main factor that causes vital linguistic deficiencies of published medical papers among Iranian authors is the Linguistic errors that hinder Iranian medical authors from transferring their knowledge correctly. These shortages arose from the

difference between the grammars of two languages (native and target language) and the unfamiliarity of academic authors from these linguistic points. We hope that the findings can help minimize some language-related difficulties in writing scientific papers in all fields of study.

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