



On improving the English language ability of Science Citation Index papers for medical postgraduates through flipped classroom teaching

Changyou Wang

College of Foreign Language, Yanbian University, Yanji, China

Medical postgraduates are the new force of scientific research groups in China. However, the limitation of their English language ability restricts their publication of high-level Science Citation Index (SCI) papers to a large extent. Measures to improve students' SCI language ability from macro, intermediate and micro aspects were discussed through flipped classroom teaching mode, such as students' reading papers before class, students' practicing paper writing after class, and teacher's making comments in class. The feedback from the questionnaire showed that 96.65% of the students were satisfied with the teaching mode and 93.57% of them had improved their confidence in SCI writing. For the problems mentioned in the feedback, it was suggested that colleges and universities should formulate policies to encourage teachers to engage in medical English teaching, meanwhile teachers should constantly improve their professional quality, so as to help students improve their SCI language ability rapidly.

Key Words: Flipped classroom teaching, Medical graduate students in China, Improvement of SCI language

Introduction

More and more medical colleges and universities have required postgraduate students, especially the academic and doctoral students, to publish Science Citation Index (SCI) papers before graduation. Therefore, postgraduate students have become an important part of China's medical research force. In recent years, the number of SCI papers in China has increased rapidly. In 2020, the number of SCI papers published by Chinese authors ranked second in the world for the 12th consecutive year, second only to the United States, but there is still a big gap between

the average citation frequency of each paper compared with the world average [1]. High-quality SCI papers should not only be innovative, scientific, and complete in content, but also be logical, readable, and normative in language. Cai [2] in 2018 claims that the main reasons for the high quantity of SCI papers but low quality are not only the lack of innovation in the content, but also the problems in their language. Mungra and Webber [3] in 2010 claims that the language problems are mainly reflected in the application of language at the lexical-grammatical level and the textual-rhetorical level, that is, vocabulary, grammar, tense, voice, expression of commonly used sentence patterns, rhetoric, and pragmatics. In addition,

Received: November 27, 2022 • Revised: January 3, 2023 • Accepted: January 4, 2023
Corresponding Author: Changyou Wang (<https://orcid.org/0000-0001-7907-3066>)
College of Foreign Language, Yanbian University, No. 977 Gongyuan Road, Yanji City, Jilin Province 133000, China
Tel: +86.0433.2732226 Fax: +86.0433.2732280 email: wangchangyouyj@163.com

Korean J Med Educ 2023 Mar; 35(1): 85-91
<https://doi.org/10.3946/kjme.2023.251>
eISSN: 2005-7288

© The Korean Society of Medical Education. All rights reserved. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0/>), which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Kim [4] in 2012 claims that lack of systematic training in SCI writing leads to non-standard paper writing among the students. According to CNKI (China National Knowledge Infrastructure) database, there are few researches on the language improvement of medical SCI papers in China, and the annual number of published papers is only a single digit (1987–2022), among which the researches on the improvement of English language ability are mostly fragmented, such as a nominalization structure research by Wang [5] in 2012, a voice use analysis by Wu and Yang [6] in 2013, and so forth. Therefore, there is a lack of systematic discussion on English language improvement of medical SCI papers.

How to effectively improve the language ability is a problem that teachers have been considering. Since postgraduate students are under the pressure to publish SCI papers, meanwhile they have a strong sense of autonomous learning and are more able to complete various tasks voluntarily before and after class than undergraduate students, so they are suitable for flipped classroom teaching. From August to December 2022, during the online teaching due to the coronavirus disease 2019 pandemic, the flipped classroom teaching mode was first introduced among the medical postgraduates to discuss their language improvement.

Methods

1. Ethical approval

The study was approved by the Institutional Review Board (IRB) of Clinical College of Yanbian University (IRB approval no., YC 232022). Written informed consent was obtained from all participants.

2. Participants

Before the implementation of flipped classroom teaching for medical postgraduates, 115 second-year postgraduate students in Clinical College of Yanbian University who came from 22 provinces in China were surveyed. Among them, the ratio of male to female was 1:2.56, 94.05% were between the ages of 20 and 30, 90.41% had passed College English Test (CET)-4/CET-6, 45.22% were confused about SCI language, and 82.38% of them would welcome the flipped classroom teaching. According to the tasks proposed by the teacher to the students before, during and after class, 83.68% would cooperate with the teacher to complete the corresponding assignments. Their good English foundation and learning desire brought confidence to teachers to adopt flipped classroom teaching. The participants of this study were those 115 students mentioned above, who were divided into two classes mainly according to their majors.

3. Process

The mastery of language goes through the process of input, internalization, and output. Krashen [7] in 1981 asserts that adults acquire their second language ability through language acquisition and language learning. Therefore, students should be placed in the medical environment of SCI papers to accumulate the language features, writing norms and structural features gradually. The whole flipped classroom teaching was divided into the following three stages in chronological order.

1) Stage 1: students' watching MOOCs and reading SCI papers before class

a. Watching MOOCs

According to the rough statistics, as many as five courses related to SCI writing have been launched in China University Massive Open Online Course (MOOC) platform (<https://www.icourse163.org/>) so far, such as “English

Journal Paper Publishing-Ladder to the International Academic Stage” of Harbin Institute of Technology, “English for Science and Technology (EST Writing)” of Xidian University, “Biomedical English Writing” of Xi’an Jiaotong University, and so forth. Due to the fact that junior postgraduate students have read fewer SCI papers, they might have problems in language application. Teachers should, in combination with the school situation, recommend high-quality MOOC writing resources to students, so that students could watch them before class and understand the language features of SCI papers within the fixed time.

b. Reading papers

Postgraduates, especially junior postgraduates, do not always know the ways to obtain excellent SCI papers in their majors and they could get them by consulting materials or tutors. According to the research by Sun et al. [8] in 2012, the linguistic features of SCI papers change relatively slowly. So students were encouraged to collect some highly cited SCI papers published recently by native English speakers, and then formed SCI corpora based on their majors, from which at least five high-quality SCI papers were selected for students to read within a fixed time before class. Through reading, students not only understood the latest knowledge of their majors, but also were required to summarize the basic framework and common writing norms of SCI papers, and so forth. At the same time, they could experience the content of MOOCs in combination with the reading of SCI papers.

By watching the above MOOCs and reading relevant SCI papers, medical students could have a general understanding of the language features, basic framework, and writing norms of SCI papers, so as to have the overall macro impression of SCI papers.

2) Stage 2: teacher’s summarizing language features, paper framework, and writing norms in class

a. Summarizing language features

The language features of SCI papers should be concise, accurate, and normative. Teachers might explain the language features of SCI papers summarized by the other researchers to students in class. Such as the summary of tense use by Wang [9] in 2009: The abstract part mainly uses the past tense, supplemented by the present tense. The introduction part mainly uses the present tense (present simple or present perfect tense). The method and materials part mainly use the past tense. The result part also mainly uses the past tense, and the discussion part uses the present tense and the past tense alternately [9]. The summary of voice use and sentence pattern by Guo [10] in 2008: The proportion of active voice is slightly higher than passive voice, and the proportion of simple sentences is equal to that of compound sentences. The summary of the relatively fixed writing patterns by Wang [11] in 2005 follows:

in the introduction section:

The present study aims to demonstrate...

In the method section:

... subjects were recruited/included on a voluntary basis.

In the result section:

There was a significant/weak negative/positive correlation between... and...

Negative/positive co-relationship was found between... and...

There was a significant/insignificant negative/ positive correlation with...

In the conclusion section:

These results support the hypothesis that...

These findings lend support to the hypotheses.

The results support our original hypothesis that...

b. Explaining framework and norms

According to the Uniform Requirements for Manuscripts Submitted to Biomedical Journals (1997), medical SCI papers usually consist of the following nine parts: title, author, abstract and key words, introduction, materials and methods, results, discussion, acknowledgments, and references. And the teacher should explain one by one according to the Introduction, Methods, Results, and Discussion (IMRaD) format. In the face of non-standard paper writing due to students' lack of writing training, teachers should explain the common norms of paper writing, including the norms of citation, reference and annotation, application of charts and graphs, and academic ethics, and so forth.

Through the teacher's summary and explanation of SCI language features, basic framework, and writing norms, and with the help of the macro impression of MOOCs and papers, students could have a deeper understanding for SCI language and finally have an intermediate impression of SCI language.

3) Stage 3: teacher-student close interaction both after class and in class

After the input and internalization of the language features, basic framework, and writing norms of SCI papers, students were required to write group papers after class and present them in class, and teachers should provide corresponding guidance after class and make comments in class.

a. Students' practicing writing and teacher's providing guidance after class

After the teacher's explanation of the IMRaD format (for example, the research status at home and abroad, innovative views, research ideas, and significance should be stated in the introduction part), students were required to consult domestic and foreign materials. After carefully sorting out the materials and determining the thesis title and brief outline by the group members of the same major,

they sent them to the teacher in advance for him to review after class.

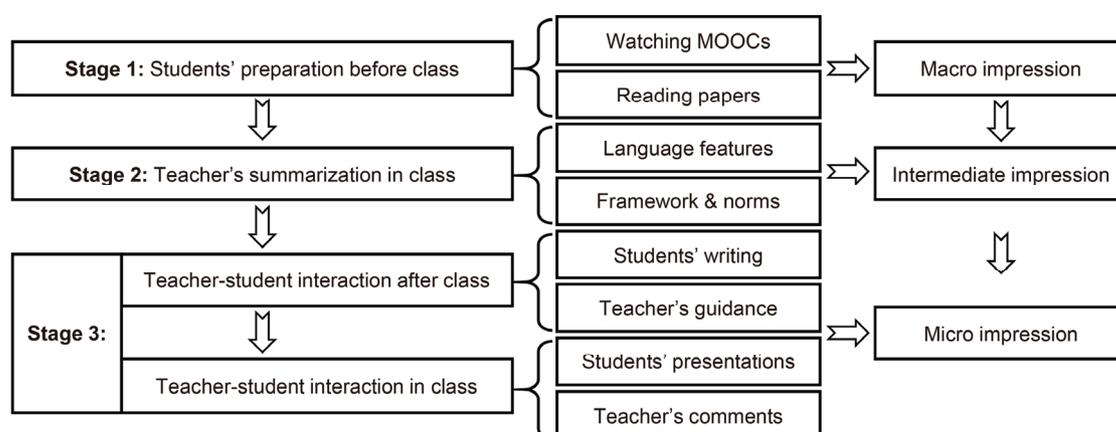
When the teacher evaluated the paper, he should focus on its basic framework, writing norms, and language features. If the submitted title and outline did not meet the requirements, they would be returned, revised, and resubmitted under the teacher's guidance after class. Otherwise, the score of the group would be canceled. For the group paper approved by the teacher (collective score), students might use translation software to appropriately expand the outline according to their division of labor, but they must follow the language norm of SCI papers while expanding them. Then they waited for making group presentations in class.

b. Students' giving group presentations and teacher's making comments in class

When the group members made presentation one by one within the limited time in class (usually 3 minutes per student), each student presented the key points according to their division of labor (individual score). In order to mobilize the participation of students in classroom activities, other groups were required to raise questions or make rational evaluation on the presentation group according to academic norms, which was the main basis for their classroom performance (classroom participation scores). Faced with other students' questions, the presentation group should make corresponding and reasonable explanations. Otherwise, their collective score, including relevant individual score, would be lower.

After each group's presentation in class, the teacher commented on the group's collective presentation and individual presentation. Faced with the problems of language application in students' SCI papers, teachers' comments mainly focused on the correctness of vocabulary, grammar, tense, and voice; the integrity of sentence expression; and the standardization of paper structure, writing logic and quotation. The teacher

Fig. 1. The Teaching Process above in Chronological Order



MOOCs: Massive Open Online Courses.

evaluated the readability, logic, and standardization of their paper as a whole. Following this mode, each group presented in turn in class.

With the help of the teacher, students could experience the language features, basic framework, and writing norms of SCI papers by practicing writing and making presentations, and finally, they formed a microscopic impression of SCI language.

The whole flipped classroom teaching process described above was roughly as follows in chronological order (Fig. 1). The above macro, intermediate and micro impressions about the improvement of SCI language ability constitute a progressive process.

Results

Medical postgraduates have an urgent need to improve their SCI language ability for a long time, but the teaching method has been considered for a long time until the flipped classroom mode was decided in the fall of 2022.

At the end of this semester, almost 100% of the participants were found to have actively completed various tasks in and out of class. According to the questionnaire and discussion conducted at the end of the semester, it

was found that although the students felt the flipped classroom teaching mode was stressful, the teaching effect was highly beneficial which exceeded the expectation. On the one hand, 96.65% of them claimed that they could gradually master the framework, writing norms, and language features of SCI papers from the macro, intermediate, and micro aspects. On the other hand, 93.57% of them claimed that their confidence in SCI writing had been greatly increased.

At the same time, it was also learned that 3.35% of the students thought that the teaching effect of large class size with flipped classroom teaching was not too ideal, and the teacher's explanation of certain problem was not deep enough and so on.

Discussion

1. Research limitation and future plan

Although students have a high degree of satisfaction and confidence in the improvement of SCI language, it is impossible for them to publish SCI papers within a short time this semester due to the time limitation. Therefore, the effect of their language improvement could not be

displayed effectively in this paper, which is the limitation of this study.

Based on teachers' years of research on students, their general English level (not academic English) is roughly the same within the latest 3-5 years. Taking this year as the watershed, it is planned to compare the students in the previous 2 years who have not received the language improvement training with the students in the following 2 years who have already received it. By tracking and counting the number of SCIs published before their graduation, the improvement of students' SCI language could be measured and evaluated.

2. Suggestion for the questionnaire

From the feedback on the postgraduates, it is realized that the large class size teaching is caused by the shortage of teachers, and the lack of in-depth explanation implies that teachers' medical knowledge needs to be improved. In a word, the construction of teaching staff should be strengthened.

1) To encourage teachers to engage in medical English teaching

At present, medical English teaching is time-consuming and laborious, and the achievements of its teaching and research are not well recognized by schools. So, the teachers are unwilling to engage in medical English teaching, resulting in the shortage of teachers. The cultivation of international talents is inseparable from the teaching staff, otherwise it would seriously affect the country's demand for talents. For this reason, medical college and universities should encourage teachers to participate in medical English teaching by formulating policies, such as giving priority to job evaluation, increasing research funds, and so forth.

2) To improve teachers' professional quality

The development of society and the updating of knowledge require teachers to keep pace with the times,

and actively construct individual knowledge structure, so as to constantly improve professional ability. Especially after the general English teachers transform to medical English teaching, they should master certain basic medical expertise as soon as possible. Meanwhile, they should be familiar with the framework system of SCI papers, writing norms, and standardized language expression by reading the latest SCI papers to prepare for the high-quality guidance for the students' paper writing. In order to encourage teachers to constantly improve their professional knowledge, their improvement in professional quality should be regarded as one of the important factors in the annual assessment.

In a word, students' language ability of SCI papers could be greatly improved through flipped classroom teaching. With the emphasis on medical English teaching from universities and the continuous improvement of teachers' professional quality, we firmly believe that postgraduates' SCI writing would move to a new stage, which could effectively guide students to embark on the road of international paper publishing and speed up the pace to become a powerful country in graduate education.

ORCID:

Changyou Wang: <https://orcid.org/0000-0001-7907-3066>

Acknowledgements: none.

Funding: This study was supported by "The 14th 5-Year Plan" for Educational Science in Jilin Province in 2021 (project title: "Study on effective implementation of medical English undergraduate teaching in comprehensive universities"; project no., ZD21021).

Conflicts of interest: No potential conflict of interest relevant to this article was reported.

Author contributions: All work was done by Changyou Wang.

References

1. Research Group of Statistics and Analysis on Chinese Scientific Papers. A brief report of statistics and analysis on Chinese scientific papers in 2020. *Chin J Sci Tech Period.* 2022;33(1):103-112.
2. Cai JG. International journal paper writing and publishing: a compulsory course for Chinese postgraduates. *Acad Degrees Grad Educ.* 2018;(4):10.
3. Mungra P, Webber P. Peer review process in medical research publications: language and content comments. *Engl Specif Purp.* 2010;29(1):43-53.
4. Kim KL. *How to write and publish SCI journal papers.* Beijing, China: Science Press; 2012.
5. Wang YX. *On nominalizations in abstracts of scientific theses [dissertation].* Chongqing, China: Chongqing Normal University; 2016.
6. Wu L, Yang J. A contrastive analysis of the use of voice in scientific English papers. *J Donghua Univ.* 2013;13(2):94.
7. Krashen SD. *Second language acquisition and second language learning.* Oxford, UK: Pergamon Press; 1981.
8. Sun L, Chen JL, Xiong HF. Exploration and practice of cultivating postgraduates' writing ability in English scientific papers. *Acad Degrees Grad Educ.* 2012;(7):25.
9. Wang YN. Linguistic features and writing skills of biomedical English papers. *J Sun Yat-Sen Univ (Med Sci).* 2009;30(6):799-801.
10. Guo SF. Quantitative analysis of language features in nature papers. *Chin J Sci Tech Period.* 2008;19(1):73-75.
11. Wang Y. Discussion on the teaching of medical English writing from the perspective of genre. *Chin High Med Educ.* 2005;(2):61-63.