

## Problem-based Learning (PBL) Method Design for Graduate: A New Exploration in Medical English Writing Teaching in China

Haiyong Wang<sup>1</sup>, Keyuan Lu<sup>2</sup>, Dong Yao<sup>3</sup>, Jing Ma<sup>3</sup>, Jiangbin Sun<sup>3</sup>, Zhenzong Du<sup>1</sup>, Jianfei Song<sup>1\*</sup>

<sup>1</sup>The Second Affiliated Hospital of Guilin Medical University, Guilin 541199, China

<sup>2</sup>Guilin Medical University, Guilin 541004, China

<sup>3</sup>Affiliated Hospital of Guilin Medical University, Guilin 541001, China

### \*Corresponding Author:

Jianfei Song

Email: [docwanghy@gmail.com](mailto:docwanghy@gmail.com)

---

**Abstract:** Teaching medical English writing for medical graduate in China exposes medical educators to special teaching methods and learning styles. The traditional approach to English writing couldn't meet the needs of medical graduates in new situation. Based on our teaching experience for medical graduates in past 5 years, several principles and lessons are outlined. This paper discussed and analyzed the problems relating to the old English curriculum in medical schools and designed a problem-based learning (PBL) English curriculum for medical graduates. Furthermore, internet resources allows medical graduates access to learning English actively. Goals are set to prepare graduates for improving writing ability in medical English. Feedback from graduates of the courses was excellent. We could also benefit from teaching in order to enhance their medical English writing ability.

**Keywords:** Medical graduate; English writing, Problem-based learning.

---

### INTRODUCTION

In recent years, the medical English curriculum especially designed for medical graduates has seldom been updated. The old English curriculum is not based on any needs assessment of medical graduates, and lacks credibility. Without an appropriate curriculum, the available English courses for medical graduates are irrelevant and ineffective [1].

Now, as parts of their academic work in China, the medical graduates are required to write and publish some papers in English. Publishing their quality research, not only can let graduates contribute to the advancement of medical science, but also can form the basis for a future program of research, providing the groundwork for a successful medical career as a scientist. In addition, potential employers often appreciate a demonstrated ability to conduct and publish medical research work. This strongly suggests that there is a need to design a new English teaching method to help graduates develop writing skills. The traditional approach to English writing does not meet the needs of medical graduates. These traditional lessons included medical terminology and simple dialogues about visiting to the doctor's office, which failed to meet the needs of the medical profession in the new situation. Some literature has described the challenges of implementing these types of curricula at all levels of medical education [2, 3]. The curriculum developed in this study is for medical graduates who

specifically need to improve their English writing skills in medical science. In doing so, our study utilized the following research procedure: review of the current English curriculum and review of medical English textbooks, writing some papers for excise. Based on the students' needs, goals were developed, problem-based learning (PBL) English curriculum was developed, teaching materials and methods, as well as evaluation procedures were also defined.

### MATERIALS AND METHODS

The goal of this project was to develop a new PBL method for describing and assessing English writing curriculum for medical graduates. A total of 100 medical graduates, from the School of Clinical Medicine, were surveyed before and after the PBL program in order to assess the proficiency in this project.

Integrating medical English writing education for medical graduates was problematic, as there is no consensus on what elements of PBL curriculum should be taught. Further, less is known about what is being taught. Given the lack of standardized approaches, we were interested in measuring the degree of variation of content, skills, and methods in medical English writing curricula taught in China. The application should be followed some characteristics of PBL. First is the problem in the PBL approach. The problem is crucial to its implementation. Problems should be adapted to the

medical English writing proficiency of the graduates. They should engage graduates' interests, motivate them to search for more writing skills, and allow them to relate the new knowledge being introduced to previous knowledge. Second, problem should be ambiguous, ill-structured, incomplete, confusing and additional information will be needed. There is usually a prescribed way to proceed in solving the problem. The third is group work in PBL, it is assumed to be a cooperative learning experience and it has positive effects on learning. Group work helps to distribute the writing task among the members of a group and allows the group as a whole to tackle problems that necessitate access to knowledge beyond that possessed by any individual graduate. It encourages graduates to coordinate different points of view, to enhance reasoning and improve high order thinking skills, all of which can promote shared knowledge construction. To accomplish these goals, PBL curriculum should cover medical English writing and review.

English has become the international language in the world. To write a medical manuscript in a second language is a challenge for many graduates whose native language is not English. Although the content of the medical manuscript is often very specialized and complex, there is no need to write about it in a complex way. Unfortunately, many Chinese graduates were under the misconception that long, obscure words and complicated terms would make their paper more impressive. This could not be further from the truth. Many medical papers are rejected by editors because of their unnecessary complexity and repetition, which make them almost impossible to read. During our PBL course, we often emphasized that, simple words and terms make a paper clear, concise, and easy to read, thereby achieving the ultimate goal of every graduate: effective communication. Our teaching aim was to convey that it need not be such a challenge if graduates follow a few simple rules based on the concept of "simplicity = clarity = effective communication."

Reviewing a scientific article is also fairly foundational work for graduates. They should become familiar with the required contents of an original article by reading previously published papers. This study started with a review of relevant literature. As a reviewer, the graduate should not tell others that he/she are reviewing the paper. After the completion of the review process, the graduate must delete all of the files pertaining to the paper that he/she received. The graduate was not allowed to manipulate the author's electronic document file. A good reviewer is also a good writer. The more reviewing exercises they do, the more they will be better in their medical English writing.

Regarding the medical English writing, we provided brief information on Science Citation Index (SCI). SCI is a bibliographic database owned by Thomson Reuters—the company that releases the journal impact factor every year. The SCI lists bibliographic information of over 3500 multidisciplinary journals and allows users to conduct comprehensive searches to gather all the relevant information they need for their own research. By simply keeping count of the publications in most of the world's prestigious English-language journals and the citations they receive, the SCI allows researchers to identify which published articles have cited a specific previous article, have cited the articles of a particular author, or have been cited most frequently by studies in a specific domain. Within the academic field it has been said that one has to "publish in English or perish". We saw all journals which strongly advise authors to provide the quality manuscripts.

Our PBL medical English curriculum design should integrate the English language and medical content. Integrated language and clinical teaching offers a means by which graduates can continue their clinical knowledge development, while they were also developing their medical English writing proficiency. PBL is well known for its learner centered and content-based approaches, which aims to meet learner-specific needs in the utilization of English for their specific field of study. We were looking into the following approaches as possible solutions: the short-term way to solve this problem could be by using a collaborative teaching approach, and the long-term way could be by conducting teacher training in the field of medical English writing.

Now about 80% of the content of the internet was in English. The graduates believed that the online course could allow them to learn without time or space limitation, and to visualize the actual communication in their future workplace; interactive teaching strategies stimulated their learning [4]. However, such learning mode seems more suitable for those highly motivated graduates. For instance, graduates who knew their own weakness and had a strong will to make. To motivate graduates, it is important first, to eliminate all avoidable barriers by providing timely learning support, good accessibility to electronic devices, etc. Equally important, peer influence can, to some extent, increase their motivation. PBL Course design is an important factor positively affecting students' interest towards the internet resource. For instance, videos were also used to familiarize them with the clinical setting. Interesting content can definitely increase students' motivation to learn. In this study, the online course used various interactive teaching strategies to attract students to learn and to help them learn English better.

## RESULTS

One hundred medical graduates participated in this study. Ninety percent of participants have indicated that PBL strategy contributed to the development of their medical English writing ability, team work abilities, presentation skills and accepting criticism from other colleagues. Regarding the tutors' role in PBL tutorials, majority of the participants (95%) indicated that this role is essential. Nevertheless, all the students indicated that this role is clear and well identified. In five years, they all passed College English Test-Band 6. Eighty five percent graduates published their papers indexed in SCI database. Our findings suggested that graduates were impressed by the design of the course as it could add confidence to their learning.

## DISCUSSIONS

As the "Science of Medicine" is getting advanced, need for better teaching techniques are imperative. PBL is an effective way of delivering medical education in a coherent, integrated manner. It has several advantages over conventional and age-old teaching methods of routine. It is based on principles of adult learning theory, including student's motivation, encouragement to set goals, think critically about decision making in daily operations. Above all these, it stimulates challenge acceptance and learning curiosity among graduates [5]. Teachers and graduates of English as a second language also find it an attractive idea; both are often concerned that their medical English should be improved.

We conducted surveys before and after the program, which was be very useful depending on the type of data a researcher wishes to obtain. In referring to surveys, questionnaires are one of the most common instruments used. They are relatively easy to prepare, and they obtain information that is relatively easy to tabulate and analyze. A survey can be an efficient way to obtain information, attitudes, or beliefs about a certain issue, and it is for this reason that a survey was used to discover specific information relevant to the medical writing program as a whole. We conducted investigating the English learning needs of graduate. Our findings help the future research take account of the following considerations. Students need to increase their general proficiency in English and had expected to be offered specialized English courses throughout their clinical practice in order to fulfill their needs. Taking students to the level of professional language is a very demanding task. The problems that have arisen came mainly from two sources. First, graduates that already had some level of English were not quite happy to begin studying with others without any previous knowledge. Second, the university authorities were not sure whether medical language should be given a special status and as a result are providing special medical writing curriculum. Our five-year experience showed that this is

a very serious matter and should form an integral part of the university medical English curriculum.

The purpose of this project was to attempt to understand the learning and teaching context sufficiently to provide suggestions for better medical English writing programming in China. Under the learning circumstance of PBL, the needs of graduates must be met by the specific design of PBL English program. Through a survey and interviews, the general problems and the needs of the program were determined, and suggestions were made that could assist the school in better serving graduates. PBL could enhance self-regulated learning skills. Self-efficacy beliefs affect their motivation through self-regulatory processes [6].

From the qualitative data, we learned that this time-consuming process of design of PBL medical English materials for medical students is complex. It contains several steps that require the researcher's collective experiences, knowledge and skills. All of which include: the knowledge of English writing teaching and learning, content knowledge of other academic disciplines, knowledge of the PBL approach, understanding available communication with content-teacher, and then integrating all to use. In the designing process, it is highly recommended to work closely with the teacher. To complete the design, designers should have adequate time to have a whole layout of carrying out this tough task with full efforts and concentration. Moreover, the materials that designer needs to have an in-depth understanding of the nature of the target course, and be able to adopt the other materials to own teaching materials design [7]. To provide a basis for further research into the design and implementation of graduates, we should have both qualities (content and process expertise), in order to have the best outcomes from the PBL tutorials [8].

Recognizing the value these casually employed facilitators have added to our medical program, we will continue to develop their skills in, for example, reviewing cases and assessment. We recommend that if institutions do employ casual facilitators, their expertise and experience can add value to the curriculum and to students' experience [9].

The questionnaire also revealed that all participating students enjoyed online PBL, without any perceived negative effects on learning. Online PBL curriculum saved the students travel time to and from school. Statistical analysis indicated no significant difference in assignment grades between the online and traditional PBL groups, indicating that online PBL learning appears to be similarly effective as traditional face-to-face PBL learning [10].

## CONCLUSION

Our medical English writing course provided a deeper understanding of the process of content materials design, which consists of defining the context, designing the PBL materials. The design should attend the integration with language and content and urge graduates to acquire the target language ability when they are solving the problems with content and complete the activities with the language. The curriculum is relevant for graduates, however, its effectiveness and sufficiency need to be tested and appropriate modifications must be made. More research needs to be done on the design and implementation of this medical program. Especially, more studies need to be done at the medical school to more accurately determine the needs of the graduates, teachers and the PBL program as a whole.

## AUTHOR'S CONTRIBUTION

Haiyong Wang, Keyuan Lu and Jianfei Song wrote the paper. Jing Ma, Dong Yao, Jiangbin Sun and Zhenzong Du supervised the composition of the paper. All authors read and approved the final paper.

## ACKNOWLEDGEMENTS

This work was supported by Health Department of Guangxi Zhuang Autonomous Region Grant [Z2015409].

## REFERENCES

1. Wang HY, Du ZZ, Lu KY, Xia XW, Li Y, Song JF. Experience in Medical English Teaching for Clinical Postgraduates. *Northwest Medical Education*. 2014;22(5):902-3,912.
2. Wang HY, Du ZZ, Li Y, Xia XW, Yuan SG, Song JF. Problems and Solutions of Thesis Writing by Medical Graduate Students. *Northwest Medical Education*. 2013;21(1):58-60.
3. Faisal R, Rehman K, Bahadur S, Shinwari L. Problem-based learning in comparison with lecture-based learning among medical students. *J Pak Med Assoc*. 2016;66(6):650-3.
4. Wang HY, Du ZZ, Lu KY, Xia XW, Li Y, Song JF. Clinical Teaching Experience of Applying Internet Resources among Surgical Graduates. *Northwest Medical Education*. 2010;18(6):1232-5
5. Preeti B, Ashish A, Shriram G. Problem Based Learning (PBL) - An Effective Approach to Improve Learning Outcomes in Medical Teaching. *J Clin Diagn Res*. 2013;7(12):2896-7.
6. Demirören M, Turan S, Öztuna D. Medical students' self-efficacy in problem-based learning and its relationship with self-regulated learning. *Med Educ Online*. 2016;21:30049.
7. Sukotjo C, Thammasitboon K, Howell H, Karimbux N. Students' perceptions of prosthodontics in a PBL hybrid curriculum. *J Prosthodont*. 2008;17(6):495-501.
8. AlHaqwi AI. Learning outcomes and tutoring in problem based-learning: how do undergraduate medical students perceive them? *Int J Health Sci (Qassim)*. 2014;8(2):125-32.
9. McLean M, Arrigoni C. How we capitalised on casual PBL facilitators' expertise and experience to add value to our medical programme. *Med Teach*. 2016;38(3):246-9.
10. Ng ML, Bridges S, Law SP, Whitehill T. Designing, implementing and evaluating an online problem-based learning (PBL) environment--a pilot study. *Clin Linguist Phon*. 2014;28(1-2):117-30.