

BIOMEDICAL ENGLISH
WRITING AND READING
WORKSHOPS FOR STUDENTS IN CHINA

生物医学英语 写作与阅读

主 编 Chief Author

澳伟林 William Orr

副主编 Associate Chief Author

李玉林 Li Yulin



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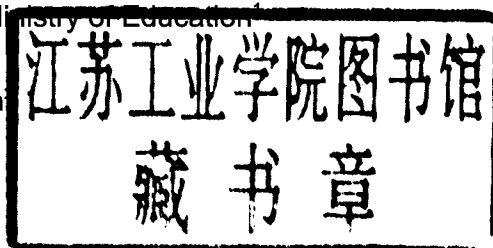
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FOREWORD

English is the internationally-accepted medium for transmission of scientific ideas. Journals, scientific congresses, and even research laboratories around the world now regularly use English as the vehicle for daily communication, no matter what the indigenous* language might be. This fact, coupled with the unprecedented rapid development of science and technology in the People's Republic of China has made it imperative for Chinese students of science to become fluent in the use of scientific English for their daily work. Students need the ability to read and critically evaluate English texts written by other scientists. Critical thinking is essential to effective reading and to the formulation of new ideas and hypotheses. It is particularly important that Chinese researchers be able to communicate their own new ideas to other scientists outside China.

Chinese students are well positioned to take on this challenge. English is now taught in virtually all schools, beginning in the elementary grades. Most young Chinese people have a good working knowledge of daily English. However, as is the case for students in all countries, in order to be successful in science, they need to understand and practice the special features of formal scientific communication.

It is obvious that writing is a major activity in any successful academic career (Pololi, Knight, & Dunn 2004). However, it is acknowledged worldwide that most training in the basic or clinical biomedical sciences fails to equip students with the skills they need to be successful scholarly writers (Rawson et al. 2005). Students for whom English is a second language often have significant difficulty with scientific reading and writing because they fail to appreciate the unique characteristics of academic writing, because they do not seek help from native speakers or other language resources, and because they do not appreciate the time required to develop competitive language skills (Wang & Bakken 2004).

This seminar course was developed while working with graduate students in the Faculties of Medicine at Shantou University Medical College and at Jilin University. It supplements the *Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication* which are included as an

* Indigenous: Local, natural for the particular geographic region.

appendix. The textbook, *How to Write and Publish a Scientific Paper* [5th Edition], 1998, written by Robert A. Day and published by Oryx Press is recommended to all students of scientific writing. Dr. Day's textbook has been used for many years throughout the English-speaking world and is considered to be a standard manual for English scientific writing.

The primary goal of this series of exercises is to help Chinese students to learn what is involved in critically reading and writing a scientific manuscript. Based upon our experience working with Chinese graduate students, each of the seminars deals with the key principles of using English to read and write about science. We intend to help Chinese students improve their English language fluency, listening and reading comprehension, writing ability, pronunciation and speaking. By studying specific examples of writing, we aim to help students develop a medical and scientific vocabulary. We hope to help them learn what is involved in writing a manuscript of sufficient quality that it would be acceptable for publication in the international scientific and medical literature. The latter has become an especially critical objective since many Chinese universities have now made publication in an internationally-recognized journal a requirement for earning a doctoral degree.

In our own use of this program, each two hour seminar begins with a didactic lecture. We have placed a written summary of the lecture at the beginning of each chapter in the handbook. Most seminars also include checklists based on the content of the seminars. These checklists can be used by students when they are reading or writing biomedical texts. Each seminar includes a series of exercises related to the content of the lecture. These exercises usually include: (1) Suggested topics for group discussion, (2) A reading exercise, (3) Exercises in using English, (4) Manuscript writing exercises. Based on our experience, students are likely to fall into groups who wish only to discuss the principles of reading and writing, and students who wish to practice preparation of a manuscript. For the latter group, the manuscript writing exercises should culminate in the preparation of a manuscript by the end of the course. We have also included optional seminars on preparation of a grant application, preparation of a *curriculum vitae*, and searching the literature, since these are important activities for academics and involve the principles of scientific writing.

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Changchun, PR China
December, 2006

The authors welcome any comments or suggestions concerning this book. We can be reached by e-mail at biomedenglish@yahoo.com.cn

前言

众所周知,目前英语已成为国际上科学思想的传播媒介。无论人们使用哪一个国家或地区的语言,国际期刊、学术会议和研究实验室通常使用英语作为交流的工具。除此之外,科学技术在中国的迅猛发展迫切要求中国学习自然科学的学生在学习和工作中能用专业英语进行熟练地交流。学生们需要培养阅读能力,也需要具有对其他科学家的科研文章进行批评性评估的能力。批评性思维不但对于高效率的阅读至关重要,而且对于形成新的思想理论和假说亦同样重要。同时,中国科研人员把他们的创新思想介绍给国外同行具有特别重要的意义。

中国学生已经做好充分准备去迎接新的挑战。在中国从小学起几乎所有各种类型学校都教授英语。大多数中国年轻人对日常英语都有比较好的应用能力。但是,如同其他国家的学生一样,为了在科学上取得成功,他们需要具有在科学领域进行信息交流的技能。

毋庸置疑,英语写作是任何成功的专业人士在其职业生涯中的一项主要活动(Poloi, Knight, & Dunn 2004)。在世界各国,人们公认绝大多数基础和临床生物医学领域的专业课程未能培养学生掌握必要的英语写作技能,从而使他们成为成功的学术论文写作者(Rawson et al. 2005)。对于把英语作为外语的学生来说,他们常常在科技英语的阅读和写作方面遇到比较大的困难。原因之一是这些学生不理解学术英语写作的独特之处;原因之二是他们不去寻求以英语为母语的人的帮助;原因之三是他们未能充分利用时间去培养自己的语言技能而使自己具有竞争能力(Wang & Bakken 2004)。

作者根据在汕头大学医学院和吉林大学医学部为研究生举办英语论文写作研讨班的教学实践撰写了这本书。本书在附录中收录了《生物医学期刊投稿统一要求》供学习者参考。由 R. A. Day 撰写并由 Oryx 出版社于 1998 年出版的《如何撰写和出版科学论文》(第五版)一书已经推荐给所有从事科学论文写作的学生。很多年以来,Day 博士撰写的这本书在讲英语的国家和地区得到广泛的应用,而且被认为是用英语撰写科学论文的标准指南。

根据我们教授中国研究生的经验,本书的写作目的是阐述科研论文的阅读和写作原理。本书中的系列课程将帮助中国学生提高运用英语听、读、发音、说和写的能力。通过学习一些具体写作范例,帮助学生积累医学和科技词汇。书中系列练习题的主要目的是帮助中国学生学会批评性地阅读和撰写科研论文。作者希望通过本书培养学生具有

撰写高质量科研论文所必需的能力,从而使他们撰写的科研论文能够被国际科学和医学期刊接受发表。目前撰写和发表科研论文已经成为中国大学教育的一个极其重要的目标。中国很多知名大学规定在有声誉的国际期刊上发表论文是授予博士学位的必要条件之一。

我们在实施本书的写作教学计划中,每两个小时的研讨课程都以教师讲解作为开头。在本书中每一讲前都有一个内容概要。大多数的讲座内容之后都附有按照课程内容制定的写作注意事项对照检查表。学生可以在阅读和写作生物医学论文时参考这些对照表。每一讲都包括与本讲内容相关的一系列练习题。这些练习题通常包括以下内容:(1)小组讨论题目;(2)阅读练习;(3)英语应用练习;(4)论文稿写作练习。根据我们的经验,学生可自愿分为两组:一组学生只讨论阅读与写作中应遵循的原则,另一组学生练习撰写论文。对后一组学生,论文的写作成稿应当是课程结束时的最终目标。除此之外,本书还包括了选修内容,例如:如何撰写科研课题经费申请书和个人简历。这些内容的写作也涉及科研论文的写作原则,对于从事学术研究的人十分重要。

作者

中国长春

2006年12月

作者欢迎广大读者对本书提出宝贵意见,我们的邮件地址为: biomedenglish@yahoo.com.cn

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SEMINAR ONE – BASIC CONCEPTS

Summary

Biomedical knowledge is changing rapidly. Reading the current literature is one of the most effective ways to keep up to date with this knowledge and its practical application to health care. Scientists and clinicians also have a responsibility to contribute to biomedical knowledge by writing about their experience and their new ideas. This is especially important in research where publication is the main product of research work. There are different types of biomedical papers, such as research studies, reviews, and case reports. Each has special purposes, features, and value. However, the common goal of all good biomedical papers is to communicate information in an effective way to as large an audience as possible. All good biomedical texts have the following features:

- They include a logical and critical analysis of a basic or clinical problem.
- They acknowledge previous work in the field and strictly avoid plagiarism.
- They include new ideas.
- These ideas are expressed in simple, everyday words.
- The structure of sentences is simple and follows the rules of good grammar.
- The text is written in an established sequence.

Publication is competitive. There is no guarantee that a manuscript will be published just because it has been written. However, there are principles of writing that help to facilitate the likelihood of success. The main purposes of this manual and seminar series are to help Chinese students learn to read English biomedical literature more easily and to help them understand what is involved in preparing a manuscript that will be published by a highly regarded journal.

第一讲 基本概念

概要

生物医学知识在飞快地发展变化，阅读当前文献是跟上知识更新及了解其在保健领域中应用的最有效途径。科学家和临床医生有责任和义务总结和发表其工作经验并提

SEMINAR ONE – BASIC CONCEPTS

出创新思想，为生物医学的发展作出贡献。这对于科研工作者尤其重要，因为发表论文是科研成果的主要表现形式。生物医学论文有多种不同类型，例如：科研论文、综述及个例报道。每一类都有其专门的目的、特点和价值。然而，所有好的生物医学论文的共同目的是以有效的方式把科学信息传达给尽可能多的读者。所有好的生物医学论文应当具有下列特点：

- 对某个基础科学或临床问题提出合乎逻辑的批评性分析
- 对前人在这个领域所做的科研予以承认，严格避免剽窃
- 有创新思想
- 用简单和普通词汇表达创新思想
- 句式结构简单，符合语法规则
- 文章按照确立的顺序撰写

发表文章投稿是具有竞争性的。一篇文章写作成稿并不保证它能够被发表。然而，如果写作者遵循一定的原则，则能增加文章发表的可能性。作者撰写这本书的目的就是为帮助中国学生学会如何比较容易地阅读和理解生物医学文献，帮助他们懂得科技论文投稿时应包括哪些内容才有可能被相应的有声誉的期刊接受发表。

Why should you read the literature?

We live in a rapidly changing world. Much of this change is the result of new ideas and the application of theoretical knowledge to the creation of new technology. Two dramatic examples of this are international air travel and communication through the internet. Biomedical sciences include the large body of knowledge that enables us to understand nature, disease, and the practical application of this theoretical knowledge to health care. The concepts that explain the principles of basic medical science and the application of these concepts to the practice of medicine are among the most rapidly changing of all areas of human endeavor. Because of this, we have a better understanding of what constitutes health and disease. We are also able to prevent diseases, recognize them in patients, and treat them better than ever before.

If you are a biomedical scientist, your main task is to do research that will contribute to a contemporary understanding of the field in which you work. If you are a clinical worker, you must know the most up-to-date ways to diagnose and treat disease in your patients. To do these things effectively, scientists and physicians alike must be aware of the current ideas in their areas of work. Some of this knowledge can be acquired by attending conferences but the most efficient and productive way to learn is to read the current literature in your field. Learning to read critically is a skill that can be developed. Reading critically is not easy but it is essential to be able to assess the quality and applicability of what you read.

Why should you publish a paper?

Scholarly writing is one of the main activities of people with academic

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appointments and is critical to their career development (Pololi, Knight, & Dunn 2004). Not least, when you hold an academic position, you want other people to know about your work and you want them to be excited by your work. Your ability to write and publish a scientific paper is almost certainly the most important skill you need to be a successful scientist. This skill enables you to document your originality, your ability to think clearly, and your productivity. The main goal of all research is publication. A published paper, especially a peer-reviewed paper, represents a statement of your ideas. It documents your scientific productivity, and, in a peer-reviewed journal, indicates that your work has been reviewed and accepted by other scientists in your field. All universities and research granting agencies expect you to publish your research to justify their support for your work. Your ability to gain promotion in a university and to obtain research funding are dependent on your research productivity. In summary, unless you publish your scientific work, it has no real value.

Types of Biomedical Papers

Scientific and clinical publications can have different formats. Each of these has special characteristics, purposes, and value. The most common formats include:

1. **The Research Study:** This type of paper describes original research, presents the research data, and discusses it in the context of previous knowledge in the field. Such papers are usually peer reviewed, that is, they are evaluated for their value by other workers in the field before they are published.
2. **Theses:** These documents are presented by students to institutions of higher learning as part of the requirements for earning a degree. Usually they contain original data¹ but sometimes they are based on a critical review of previously published data. The work in a thesis is evaluated by experts in the research area. Most universities catalogue and store the theses of their students. However, theses are not usually disseminated² widely.
3. **Case Report:** Case reports are medical publications that describe unusual presentations of clinical problems. They often add new information about a particular disease and integrate this information with previous knowledge in the field. Case reports must be written well and with a clear purpose since they are often regarded as “second class” publications that only clutter up the literature (Chelvarajah & Bycroft 2004).
4. **Review Paper:** Reviews attempt to analyze a scientific or medical problem by making a comprehensive study of the literature in the area. Reviews are especially useful when one is trying to understand the main concepts and

¹ Original data: Scientific observations made by an individual or group.

² Disseminated: Distributed, published.

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current controversies³ about a specific topic. A good review is highly critical and analytical⁴ (Tobin 2003). It often contains large numbers of references.

5. **Textbooks:** Textbooks are written to give a comprehensive summary of the core concepts in a field of knowledge so that someone who is unfamiliar with this field can acquire a comprehensive understanding of it. Textbooks are often used to convey the essential information that is part of a school or university course. They can also be used as references for detailed knowledge. One of the most important problems in using textbooks is that they are almost always out of date, especially in disciplines where the knowledge is changing rapidly. This is because it often takes several years to write a textbook and another several years to publish it.
6. **Conference Reports:** These articles are similar to reviews. They summarize the information and discussions that have taken place at a recent scientific or medical conference.
7. **Book Reviews:** Book reviews are critical analyses of recently published books. They are usually written by experts in the field.
8. **Oral Papers and Posters:** These are vehicles for presentation of recent scientific data at conferences. Papers and posters are especially important because they are a means by which scientists communicate their most recent findings and opinions to each other.
9. **Applications for Research Funding.** Grant applications are submitted to research funding agencies and governmental agencies to apply for money to support the work in a laboratory. They contain a summary of current knowledge in a specific area, your original ideas about how this knowledge might be extended (your hypothesis), and specific descriptions of the experiments you plan to do in order to test your hypothesis.

What are the characteristics of a good biomedical paper?

The common goal of all good biomedical papers is to communicate information in an effective way to as large an audience as possible. In science, great emphasis is placed on originality. Therefore, good papers almost always attempt to convey a new idea and to show how this new information adds to an established body of knowledge. Consequently, all good scientific papers need to acknowledge and (at least briefly) review the established knowledge in order to put the new idea into context.

All good biomedical texts include a critical analysis⁵ of a basic or clinical

3 Controversies: Different points of view, differing opinions.

4 Analytical: Critical, characterized by identifying the components of an argument or idea.

5 Critical analysis: A thoughtful discussion of the main parts of an issue.

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problem. Usually this analysis is based on careful presentation of original data but sometimes (for example, in a review-type paper or textbook), the main body of the text is a critical and original analysis of previously published data. It is essential that the ideas be presented in an organized way so that one idea is linked to and follows the previous idea. In other words, the paper must be organized and must demonstrate logical thought progression⁶.

One important characteristic of good scientific writing is that it always gives recognition to previous work in the field and therefore includes bibliographic references. Good writing strictly avoids plagiarism⁷.

The importance of language

In a good paper, the use of language and the structure of the sentences must be clear and simple. The ideas should be expressed in simple, everyday words. The text must be written following the rules of good grammar. Short simple sentences are easier to understand than long complicated ones. Each sentence needs a subject, verb, and object. Singular and plural forms of verbs need to agree with the nouns to which they refer. It is usually easier to write and understand the active voice than the passive voice. Scientific writing should be so clear and simple that both expert and non-expert readers can understand it. Any well-educated person should be able to read and understand the text. Some scientists seem to think that their manuscripts should be difficult to understand; there is really no justification for this point of view (Grace 2003).

Good writing avoids the use of jargon and abbreviations because these make the text difficult to understand. Jargon is confused, unintelligible language, technical terminology used in a specific activity or by a specific group of people, or obscure, pretentious⁸ language. Scientists and colleagues in the same research laboratory or research field often use jargon in daily oral speech. However, such language may be mumbo jumbo⁹ or gobbledegook¹⁰ to people outside the area and does not belong in a scientific article. Studies have shown that jargon is often misunderstood, even by workers in fields which use it (Waseem et al. 2005). If you must use technical terminology, explain it briefly.

Most journals consider that permissible abbreviations include standard units of measure such as SI Units.¹¹ Many journals also have a short list of standard abbreviations that are frequently used by writers in those journals. Apart from this,

6 Logical thought progression: Presentation of ideas that are closely linked together. The order in which they are presented is important in understanding their relationships.

7 Plagiarism: The act of using someone else's words or ideas as your own, without giving them credit.

8 Pretentious: unnecessarily formal, flowery, or showy.

9 Mumbo jumbo: unnecessarily complicated and incomprehensible.

10 Gobbledegook: wordy and generally unintelligible language.

11 SI Units: from French *Système International d'Unités* = *International System of Units*.