Chapter 5
When English Is a Foreign Language

Two authors of the present book . . .
freely acknowledge that they are more fluent in German and French,
yet they enjoy communicating in English and are convinced that it is
more than mere historical coincidence . . . that has led English
to become the lingua franca *of modern science.*

— HANS F. EBEL, CLAUS BLIEFERT, and WILLIAM E. RUSSEY,
The Art of Scientific Writing (1987)

I ventured to write this book in English because
it will be more easily read in poor English
than in good German by 90% of my intended readers.

— HANS J. STETTER, *Analysis of Discretization Methods for*
Ordinary Differential Equations (1973)

England and America are two countries divided by a common language.

— GEORGE BERNARD SHAW

Please feel free to change any words that you wish.
I tried to make it sound Vulcan—a lot of unnecessarily long words.

— Star Trek: The Next Generation, "Unification II", Stardate 45245.8.

English grammar is so complex and confusing
for the one very simple reason that
its rules and terminology are based on Latin—
a language with which it has precious little in common.

— BILL BRYSON, *Mother Tongue: English and How it Got That Way* (1990)

If English is not your first language then writing mathematics is doubly difficult, since you have to grapple with grammar and vocabulary as you try to express your thoughts. In this chapter I offer a few basic suggestions and give some references for further reading. The problems encountered by a non-native writer of English depend very much on the writer's first language. I concentrate on general advice that is not specific to any particular language.

5.1. Thinking in English

Try to think in English and construct sentences in English. If you compose in your own language and then translate you are more likely to produce prose that is not idiomatic (that is, does not agree with standard usage). Here are some examples of non-idiomatic phrases or sentences:

- ▷ *Capable to do.* Although this is logically correct, convention requires that we say "capable of doing".
- ▷ *We have the possibility to obtain an asymptotic series for the solution.* We do not normally say "possibility to". Better is *It is possible to obtain ...* (passive voice), or, shorter, *We can obtain ....*
- ▷ *This result was proved already in* [5]. *Already* should be deleted or replaced by *earlier* or *previously.* Alternative: *This result has already been proved in* [5].
- ▷ *The solution has been known since ten years.* This type of construction occurs in those European languages in which one word serves for both *for* and *since.* In this example, *since* should be replaced by *for.*
- ▷ *This approach permits to exploit the convexity of f.* The phrase should be *permits us to exploit* (active voice) or *permits exploitation of* (passive voice). Or, depending on the context, it may be acceptable to shorten the sentence to *This approach exploits the convexity of f.*
- ▷ *To our experience ....* The correct phrase is *In our experience ....*
- ▷ *We invoke again Theorem* 4.1. This sentence is correct, but does not sound quite right to a native speaker of English. Better is *We invoke Theorem* 4.1 *again* or *Once again we invoke Theorem* 4.1.

▷ *The method is easy to use and performant.* There is no word *performant* (even though the verb *converge*, for example, produces the adjective *convergent*). "Performs well" is probably the intended meaning.

▷ *In the next section we give some informations about the network of processor used.* Here, the problem is with the plurality of nouns: it should be *information* (an uncountable noun) and *processors.*

Part of the process of thinking in English is to write your research notes in English from the start and to annotate the books and papers you study in English.

5.2. Reading and Analysing Other Papers

Read as many well-written papers in your field as you can. Ask a friend or colleague for recommendations. Analyse the following aspects.

Vocabulary. What kinds of words occur frequently in technical writing? Look up words that you don't know in a dictionary. For technical terms you may need to use a mathematical or scientific dictionary or encyclopedia. Note the range of applicability of particular words.

Synonyms. Notice different ways of saying the same thing and different ways of ordering sentences. Use what you learn to avoid monotony in your writing.

Collocations. These are groups of words that commonly appear together. For example, feeble and fragile are synonyms for weak, but weak has more meanings, and while we readily say "weak bound" we never say "feeble bound" or "fragile bound". As another example, we say "uniquely determined" or "uniquely specified" but not "uniquely fixed" or "uniquely decided". Build up a list of the collocations you find in mathematical writing.

Idioms. Idioms are expressions whose meanings cannot be deduced from the words alone, but are established by usage. Here are some examples of idioms that are sometimes found in technical writing (and more commonly in speaking), with the idiom in the left column and a definition in the right column.

By and large.	Taking everything into account.
End up.	Reach a state eventually.
In that.	In so far as.
It goes without saying.	Something so obvious that it needn't be said.
On the other hand.	From the other point of view.
On the whole.	In general, ignoring minor details.
Over and above.	In addition to.
Rule of thumb.	A rule based on experience and estimation rather than precise calculation.
Start from scratch.	To start from the beginning with no help.
Trial and error.	Attempting to achieve a goal by trying different possibilities to find one that works.

Errors in the use of idioms tend to be very conspicuous. It is good advice to avoid idioms until you are sure how to use them correctly.

5.3. Distinctions

Satisfy, Verify. These words can be difficult to distinguish for some nonnative speakers, who often incorrectly use *verify* for *satisfy*. In mathematics, *verify* means to establish the truth of a statement or equation, and is a synonym for check; it is the mathematician who verifies. On the other hand, a quantity *satisfies* an equation if it makes it true. Thus we write "We now verify that x is a global maximizing point of f" but "We have to show that x satisfies the sufficient conditions for a global maximizer."

5.4. Articles

Some languages either do not have articles (words such as "the", "a" and "an") or use them in a different way than in English, so it is difficult for speakers of these languages to use articles correctly in English. The rules of article use are complicated. Swan [266] explains them and identifies two of the most important.

(1) Do not use *the* (with plural or uncountable nouns) to talk about things in general. Examples: "Mathematics is interesting" (not "The mathematics is interesting"); "Indefinite integrals do not always have closed form solutions" (not "The indefinite integrals do not always have the closed form solutions").

(2) Do not use singular countable nouns without articles. Examples: "the derivative is", "a derivative is", but not "derivative is".

In certain circumstances an article is optional. The sentences "A matrix with the property (3.2) is well conditioned" and "A matrix with property

(3.2) is well conditioned" are both correct.

Mistakes in the use of articles are undesirable, but they do not usually obscure the meaning of a sentence.

5.5. Ordinal Numbers

Here are examples of how to describe the position of a term in a sequence relative to a variable k:

kth, $(k+1)$st, $(k+2)$nd, $(k+3)$rd, $(k+4)$th, ...
(zero*th*, fir*st*, seco*nd*, thi*rd*, four*th*, ...)

Generally, to describe the term in position $k \pm i$ for a constant i, you append to $(k \pm i)$ the ending of the ordinal number for position i (th, st, or nd), which can be found in a dictionary or book of grammar.

5.6. Negatives

A double negative results when two words with negative meanings are used together. Double negatives are commonly used in some languages (for example, French and Spanish) as a way of expressing a single negative idea. In English, however, two negative words combine to give a positive meaning. Double negatives are sometimes used for special effect, but they should be avoided in technical writing. Examples of double negatives are

- ▷ We do not know nothing about the location of the roots. (Literally means "We know something." Replace by *We know nothing* or *We do not know anything.*)

- ▷ The method hasn't never failed to work in our experience. (Literally means "The method has failed." Replace *never* by *ever* or *hasn't* by *has.*)

5.7. Constructions

Certain constructions are common in mathematical writing. You may find it helpful to make a list for reference, beginning with the following entries. The left column contains constructions, and the right column examples.

Let ... be	Let f be a continuous function.
If ... then	If $\alpha > -1$ then the integral exists.
Suppose (that) ... is/are	Suppose g is differentiable. Suppose that A and B have no eigenvalue in common.
We define ... to be	We define a problem to be stable if ...
It is easy to see/show that	It is easy to show that the error decays as t increases.
From ... we have	From (5.2) we have the inequality ...
By substituting ... into ... we obtain	By substituting (1.9) into (7.3) we obtain ...
A lower bound for	A lower bound for h can be obtained from ...
Without loss of generality	Without loss of generality we can assume that $x > 0$.

5.8. Connecting Words and Phrases

In this section I give examples of the use of words and phrases that connect statements. Most of the examples are followed by comments on the degree of emphasis; note, however, that the emphasis imparted sometimes depends on the context in which the word or phrase appears, so extrapolation from these examples should be done with care. Mastering these connectives, and the differences between them, is an important part of learning to write technical English. This section is loosely based on [78, pp. 191–194].

Combinations

Statement a: Direct methods are used to solve linear systems.
Statement b: Iterative methods are used to solve linear systems.

and	Direct methods *and* iterative methods are used to solve linear systems. (No emphasis on either type of method.)
both	*Both* direct and iterative methods are used to solve linear systems. (Similar to *and*.)
also	Direct methods, and also iterative methods, are used to solve linear systems. Direct methods are used to solve linear systems, as also are iterative methods. (Slight emphasis on direct methods.)

as well as Direct methods, as well as iterative methods, are used to solve linear systems.
(Similar to *also.*)

not only ... but also Linear systems can be solved *not only* by direct methods *but also* by iterative methods.
(Emphasizes that there is more than one possibility.)

apart from/in addition to *Apart from* (*in addition to*) direct methods, iterative methods are used to solve linear systems.
(Emphasizes that there is more than one type of method; slightly more emphasis on direct methods than *also* but less than *not only ... but also.*)

moreover/furthermore The name of Gauss is attached to the most well-known method for solving linear systems, Gaussian elimination. *Moreover* (*furthermore*), a popular iterative technique also takes his name: the Gauss–Seidel method.
(Stresses the statement after *moreover/furthermore.*)

Implications or Explanations

Statement a: The problem has a large condition number.
Statement b: The solution is sensitive to perturbations in the data.

as/because/since *As* (*because, since*) the problem has a large condition number, the solution is sensitive to perturbations in the data.
The solution is sensitive to perturbations in the data, *as* (*because, since*) the problem has a large condition number.

due to The sensitivity of the solution to perturbations in the data is *due to* the ill condition of the problem.
(More emphatic than *as.*)

in view of/owing to/on account of *In view of* (*owing to, on account of*)[7] the ill condition of the problem, the solution is sensitive to perturbations in the data.
(More emphatic than *as.*)

[7] *Due to* would be incorrect here; see §4.14.

given *Given* the ill condition of the problem, the solution is necessarily sensitive to perturbations in the data.
(Inevitable result of the stated condition.)

it follows that The problem has a large condition number. *It follows that* the solution is sensitive to perturbations in the data.
(Puts more emphasis on the first statement than *as*.)

consequently/therefore/thus The problem has a large condition number and *consequently* (*therefore*, *thus*) the solution is sensitive to perturbations in the data.
(Intermediate between *as* and *it follows that*. *Consequently* and *therefore* are preferable to *thus* at the beginning of a sentence.)

Modifications and Restrictions

Statement a: Runge-Kutta methods are widely used for solving non-stiff differential equations.
Statement b: For stiff differential equations, methods based on backward differentiation formulae (BDF) are preferred.

alternatively If the differential equations are non-stiff, Runge-Kutta methods can be used; *alternatively*, if the differential equations are stiff, BDF methods are preferred.

although *Although* Runge-Kutta methods are widely used for non-stiff differential equations, BDF methods are preferred when the differential equations are stiff.
(More emphasis on BDF methods than *alternatively*.)

though Runge-Kutta methods are widely used for non-stiff differential equations, *though* BDF methods are preferred when the differential equations are stiff.
(*Though* is weaker than *although*, and it tends to be used inside a sentence rather than at the beginning. In this example *though* could be replaced by *although*, which would give greater

emphasis to the BDF methods.)

but If the differential equations are non-stiff, Runge-Kutta methods can be used, *but* if the differential equations are stiff, BDF methods are preferred.
(Similar to *though*.)

whereas BDF methods are used for stiff differential equations, *whereas* Runge-Kutta methods are used for non-stiff equations.

by contrast Runge-Kutta methods are widely used for non-stiff differential equations. *By contrast*, for stiff equations BDF methods are the methods of choice.

except *Except* for stiff differential equations, for which BDF methods are preferred, Runge-Kutta methods are widely used.
(Clearly defined limitation or restriction.)

however[8]/on the other hand Runge-Kutta methods are widely used for solving non-stiff differential equations. *However* (*on the other hand*), for stiff differential equations BDF methods are preferred.
(Note that *however* and *on the other hand* are not always interchangeable. *On the other hand* is applicable only when there are two possibilities, corresponding to our two hands! This example is similar to *although* and *though*, but it merely joins the two statements.)

nevertheless BDF methods are much less well known than Runge-Kutta methods. *Nevertheless*, there is great demand for BDF codes.
(The second statement is true even though the first statement is true. It would not be correct to replace *however* by *nevertheless* in the previous example, although these two words are sometimes interchangeable.)

despite/in spite of *Despite* (*in spite of*) the stiff nature of the differential equations that arise in his chemical reaction problems, Professor X prefers to use his favourite Runge-Kutta code.

[8] *However* can be used with another meaning. "However Runge-Kutta methods are used" means "no matter how Runge-Kutta methods are used".

(Even though his differential equations are stiff, Professor X uses his Runge-Kutta code.)

instead of/rather than For stiff differential equations we use BDF methods *instead of* (*rather than*) Runge-Kutta methods. *Instead of* using (*rather than* use) our usual Runge-Kutta code we turned to a BDF code because we thought the differential equations might be stiff.
(*Rather than* and *instead of* are generally interchangeable but their meaning is different: *rather than* implies a conscious choice, whereas *instead of* merely states an alternative.)

Conditions

Statement a: The indefinite integral does not have a closed form solution.
Statement b: Numerical integration provides an approximation to the definite integral.

if *If* the integral cannot be evaluated in closed form, numerical integration should be used to obtain an approximation.

unless *Unless* the integral can be evaluated in closed form, numerical integration should be used to obtain an approximation.
(Using the converse of the logical condition for *if*.)

whether or not *Whether or not* a closed form exists, numerical integration will always provide an approximation to the integral.
(A numerical approximation can be obtained independent of whether a closed form exists for the integral.)

provided (providing) that *Provided* (*providing*) *that* a closed form solution does not exist, the student may resort to numerical integration.
(More restrictive than *if*. The *that* following *provided* or *providing* can often be omitted, as it can in this sentence.)

Emphasis

Statement: Gaussian elimination with row interchanges does not break down; a zero pivot is a welcome event for it signals that the column is already in triangular form and so no operations need be performed during that step of the reduction.

indeed Gaussian elimination with row interchanges does not break down; *indeed*, if a zero pivot occurs it signals that the column is already in triangular form and so no operations need be performed during that step of the reduction.
(Introducing a further observation that builds on the first one.)

actually A zero pivot in Gaussian elimination with row interchanges is *actually* a welcome event, for it signals that the column is already in triangular form and so no operations need be performed on that step of the reduction.
(Here, *actually* emphasizes the truth of the statement. It could be replaced by *indeed*, but in the first example *indeed* could not be replaced by *actually*; this is because both words have several slightly different meanings.)

clearly A zero pivot in Gaussian elimination with row interchanges signals that the column is already in triangular form and that no operations need be performed on that step of the reduction, so the method *clearly* (*obviously, certainly*) cannot break down.

5.9. Spelling

Many English words have alternative spellings. These alternatives fall broadly into two classes. The first class contains those words that are spelled differently in British and American English. Table 5.1 illustrates some of the main differences. A special case worthy of mention is the informal abbreviation for mathematics: maths (British English), math (American English). Obviously, you should use British spellings or American spellings but not a mixture in the same document.

The second class of words is those that have alternative spellings in British English.

Table 5.1. British versus American spelling.

British spelling	American spelling
behaviour	behavior
catalogue	catalog or catalogue
centre	center
defence	defense
grey	gray
manoeuvre	maneuver
marvellous	marvelous
modelled	modeled
modelling	modeling
skilful	skillful
speciality	specialty

embed, imbed

learnt, learned. The past tense of the verb *learn.* The advantage of *learnt* is that it avoids confusion with the other meaning of *learned,* which is "having much knowledge acquired by study" (and which is pronounced differently from the first meaning).

spelt, spelled. The past tense of the verb *spell.*

In the last two examples, the -ed ending is the form used in American English. Other examples are

acknowledgement	acknowledgment
benefited	benefitted
encyclopaedia	encyclopedia
focused	focussed
judgement	judgment

There is a host of words, mostly verbs, that can take an -ise or -ize ending. Examples are *criticize* and *minimize.* The -ize ending is used in American English, while the -ise ending tends to be preferred in British English (even though *The Concise Oxford Dictionary* gives prominence to the -ize form). A number of words, including the following ones, take only an -ise ending:

> advise, arise, comprise, compromise, concise, devise, disguise, exercise, expertise, likewise, otherwise, precise, premise, reprise, revise, supervise, surmise, surprise, treatise.

Verbs ending in -yse (such as *analyse* and *catalyse*) are spelt -yse in British English and -yze in American English.

Several plurals have alternative spellings:

appendices	appendixes
formulae	formulas
indices	indexes
lemmata	lemmas
vertices	vertexes

There are also pairs of words that have different meanings in British English but for which one of the pair is often (or always) used with both meanings in American English. Examples: ensure and insure (insure is frequently used for ensure in American English), practice and practise (see §4.14). These differences are subtle, and mastering them is not vital to producing clear and effective prose (native speakers also find them confusing). For a good explanation of the reasons for the often haphazard spelling of English, and the reasons for the differences between British and American spelling, I recommend the book by Bryson [42].

Finally, it is important to be aware of words that have very similar spellings or pronunciations, but different meanings. Examples:

accept (agree to receive)	except (but, excluding)
adapt (modify)	adopt (take up, accept)
advice (noun)	advise (verb)
affect (verb: influence)	effect (noun: result, verb: bring about) (see also §4.14)
complement (the rest)	compliment (flattering remark)
dependant (noun)	dependent (adjective)
device (noun: scheme)	devise (verb: invent)
discreet (careful)	discrete (not continuous)
precede (go before)	proceed (continue)
principal (main)	principle (rule)
sign	sine (trigonometric function)
stationary (fixed)	stationery (materials for writing)

5.10. Keeping It Simple

The best way to avoid making errors is to keep your writing simple. Use short words and sentences and avoid complicated constructions. Such writing may not be elegant, but it is likely to be unambiguous and readily understood. As your knowledge of English improves you can be more ambitious with your sentence structure and vocabulary. Here is an example giving simple and complicated versions of the same paragraph.

Simple: We note that if the transformation matrix H_p has large elements then A_p is likely to have much larger elements than A_{p-1}. Therefore we can expect large rounding errors in the pth stage, in which case the matrix F_p will have large norm.
Complicated: This conclusion is reinforced if we observe that a transformation with a matrix H_p having large elements is likely to give an A_p with much larger elements than A_{p-1}, and the rounding errors in this stage are therefore likely to be comparatively large, leading to an F_p with a large norm.

5.11. Using a Dictionary

In addition to a bilingual dictionary, you should buy a monolingual English dictionary and a thesaurus (preferably hardback ones, as you will be using them a lot!). Most bilingual dictionaries do not provide enough detail or wide enough coverage for the writer of scientific English. Also, using a monolingual dictionary will help you to think in English. Instead of, or in addition to, a general-purpose dictionary, you may want to acquire a dictionary written for advanced learners of English, of which there are several. These dictionaries have several notable features. They

- describe a core vocabulary of contemporary English;
- use simple language in their definitions (the *Longman's Dictionary* mentioned below uses a special defining vocabulary of 2000 words);
- give guidance on grammar, style and usage;
- provide examples illustrating typical contexts;
- show pronunciation;
- in some cases, show allowable places to divide a word when it must be split at the end of a line. (This information can also be found in special-purpose dictionaries of spelling and word division.)

Three such dictionaries described as "outstanding" by Quirk and Stein [232] are the *Longman Dictionary of Contemporary English* [181], *Collins Cobuild English Dictionary* [59] and the *Oxford Advanced Learner's Dictionary of Current English* [212]. Another dictionary that you may find useful is *Collins Plain English Dictionary* [61], which has very easy to read definitions.

Whereas a dictionary provides meanings for a word, a thesaurus lists alternatives for it that have approximately the same meaning (synonyms).

Most thesauruses are arranged alphabetically, like a dictionary. In preparation for using your dictionary and thesaurus you should learn the abbreviations they use (these are usually listed at the front) and make sure you understand the grammatical terms noun, adjective, adverb and (transitive or intransitive) verb.

When you are looking for the right word to express an idea, pick whatever words you already know (or that you find in a bilingual dictionary) and look them up in the thesaurus. Then look up in the dictionary the definitions of the synonyms you find and try to decide which is the most appropriate word. This may take some time. It is worth making a note to summarize the search you conducted, as you may later want to retrace your steps.

Watch out for "false friends"—two words in different languages that are very similar but have different meanings. Examples:

French: *actuellement* = at present, currently. Cf. actually.
Italian: *eventuale* = possible. Cf. eventual.
German: *bekommen* = get, receive. Cf. become.

Part of the task of choosing a word is choosing the correct part of speech. Suppose you write, as a first attempt,

> *The interested Jacobian matrices are those with large, positive dominate eigenvalues.*

The two words most likely to be wrong are *interested* and *dominate*, as they can take several different forms. *The Concise Oxford Dictionary* (COD) says dominate is a verb, one meaning of which is "have a commanding influence on". The word we are looking for is an adjective, as it describes a property of eigenvalues. The previous dictionary entry is *dominant*, an adjective meaning most influential or prevailing. This is the correct word. The word *interested* is the correct part of speech: it is an adjective, as it should be since it describes the Jacobian matrices. The COD defines interested as meaning "having a private interest; not impartial or disinterested". It is therefore incorrect to talk about an *interested Jacobian matrix*. The word we require is *interesting*, another adjective meaning "causing curiosity; holding the attention". This example indicates how useful a dictionary can be if you are unsure of vocabulary and grammar. It is a good idea to look up in the dictionary every nontrivial word you write, to check spelling, meaning and part of speech. Do this after you have written a paragraph or section, so as not to interrupt your train of thought.

Using analogy to reason about English vocabulary works often, but not always. The noun *indication* is related to the verb *indicate*, and the pattern (noun, verb) = (-ion, -ate) is common. There are exceptions, however, and

the one that most often causes trouble to the mathematical writer is the pair *perturbation* and *perturb*—there is no verb *perturbate*.

You will not be able to write perfect English simply by using a dictionary, because even the learner's dictionaries cannot tell you everything you need to know. The best way to learn the subtler aspects of English is to ask someone more fluent in English than yourself to comment on what you have written. If you are not used to writing in English it is almost obligatory to obtain such advice before you submit a paper for publication. Even better is to have a fluent speaker as a co-author. Make sure that you learn from the corrections and suggestions you receive, and keep a note of common mistakes, so as to avoid them.

5.12. Punctuation

There can be differences in punctuation between one language and another. In English, a decimal point separates the integer part of a number from its fractional part ($\pi \approx 3.141$) but in some European languages a comma is used instead ($\pi \approx 3{,}141$). In English, a comma is used to indicate thousands (2,135), but in French, until quite recently, a full stop was used for this purpose (2.135). (Note that a full stop in British English is a period in American English).

Some examples of different sentence punctuation follow, where _____ denotes a sentence or phrase in the given language.

Question: English: _____?
Greek: _____;
(romanized) Japanese: _____ ka
Spanish: ¿_____?

Quotation: English: "_____"
French, Italian, Spanish: ≪_____≫
German: „_____“ or ≫_____≪
Swedish: "_____"

Semicolon: English: _____;
Greek: _____· (but now little used)

5.13. Computer Aids

If you are writing on a computer make regular use of a spelling checker. As well as using a spelling checker to check text already typed, you may also be able to use it to complete or correct a spelling you are unsure of before you put the word into your document. If a style checker is available and

you find it helpful, use it too. See §§14.5 and 14.6 for more about spelling checkers and style checkers.

5.14. English Language Qualifications

Two examinations are widely accepted for fulfilling university entrance requirements.

- The Test of English as a Foreign Language (TOEFL) is administered by the Educational Testing Service (required grade 500–580). This test is universally accepted in the US and is becoming more widely accepted in the UK.
- The International English Language Testing System (IELTS) is jointly managed by the British Council, the University of Cambridge Local Examinations Syndicate (UCLES) and the International Development Program of Australian Universities and Colleges (IDP). It is administered by UCLES. This test is widely accepted in the UK and Australia (minimum scores for undergraduate or postgraduate entry range from 4.0 to 7.5) and by an increasing number of institutions in the US.

Ideally, you will have attained these standards before you attempt to write research papers in English. English language courses for non-native speakers are available at many institutions.

5.15. Further Reading

A useful guide on how to use an English dictionary is the booklet by Underhill [282]. It is aimed particularly at users of learner's dictionaries from Oxford University Press and contains many exercises.

Swan's *Practical English Usage* [266] is an invaluable guide for the intermediate or advanced learner of English. It is arranged in dictionary form and covers vocabulary, idiom, grammar, style, pronunciation and spelling. It lists many common examples of incorrect usage, explains differences between British and American English, and distinguishes between formal and informal usage. The *Longman Dictionary of Common Errors* [136] aims to help the reader "avoid or correct those errors most frequently made by foreign learners of English".

Herbert's *The Structure of Technical English* [138] is aimed at students who have completed about six years of learning English and describes "the special structures and linguistic conventions of the English used in technical and scientific writing". This book has been described as pioneering,

for being the first textbook in the area now known as English for Specific Purposes (ESP) [265]. Similar books are Swales's *Writing Scientific English* [264] and Ewer and Latorre's *A Course in Basic Scientific English* [78]; the latter contains a useful "dictionary of basic scientific English".

Trzeciak's *Writing Mathematical Papers in English* [274] is a cookbook of phrases used in mathematical writing, ready for adaptation by the reader, and also offers advice on English grammar, using mathematically oriented illustrations.

In *Communicating in Science* [36] Booth offers a short chapter titled "Addressed to those for whom English is a foreign language," which includes examples of words that are often used incorrectly.

You may be able to find books on English writing that are designed for readers with your particular linguistic background. For example, I am aware of two excellent books for Swedish speakers. *The Writing Process* [31] is by members of a research group in the English Department at the University of Stockholm and is based on ideas of the Bay Area Writing Project at Berkeley, a widely used programme for improving writing in American schools and colleges. *Using Numbers in English*, by MacQueen [190], explains many aspects of using numbers, including how to say in words expressions such as "1.06", "2115", and "the 1800s"; various uses of "one" and "once"; numbers as adjectives or prepositions; and percentages.