Introducing a Logical Thinking Approach to Teaching Academic Writing:
Why is Logical Thinking Education Needed in Academic Writing[1]

Wai Ling Lai
Nagoya University

Since its establishment, academic writing education has been implemented basically as a language education program. Although the limited scope of academic writing education is helpful for those who write academic papers in their second or third language, it is not very popular for the majority of academic writers. This paper aims to explain why this is the case, and how academic writing education can become more attractive. Accordingly, the paper will be divided into two parts. The first part focuses on the problem. I shall explain that the limited scope of academic writing education is not popular because it cannot help the majority of academic writers to deal with the most serious problems in academic writing; namely how to make their thoughts in the writing clear and convincing. The second part suggests how the problem should be solved. I shall argue that in order to help the writers make their thoughts clear and convincing, an appropriate education in logical thinking should be incorporated into academic writing. But as we shall see, the logic education proposed here differs radically from the conventional approaches.

1. Academic Writing Education

It is hard to define "academic writing," simply because there is an extensive category that falls under the term. Books, journal articles, essays, reports, grant applications, and even emails are but some well-known examples of academic writing. There are many more.

Relatively speaking, it is easier to define "academic writing education." Although there are many types of academic writing, we do not have to teach all of them. But more importantly, the purpose of academic writing education can be basically the same regardless of the types of the writing.

For Mei-Writing, the department of academic writing education of Nagoya University, our educational purpose is to teach graduate students how to write clearly and convincingly for publication by teaching them, among other things, how to build a clear thesis statement and a convincing argument for their research. The meaning of publication here is rather wide. In the strongest sense, it means professional publications, such as books, journal articles and conference papers. In a weaker sense, it covers written works produced within an academic institution, such as graduate dissertations, theses, and even year-end term papers. And in the weakest sense, it simply means "that the writer has the opportunity to share a draft with more than one reader" (Murray 2004, 190).

To fulfill our educational purpose, we need to teach our students not only the ability to write well, but also the ability to think well. This is the specific reason why we think logical

---

[1] The title of this paper was the title of my plenary talk at the 1st International Symposium on Academic Writing and Critical Thinking held at Nagoya University on February 16, 2013. The research project covered by the main title is actually twofold. It aims to argue not only that academic writing education needs logical thinking education, but also vice versa. The talk, as well as this paper, focuses only on the first part of the project; hence the subtitle.

thinking education is necessary for academic writing education. However, there is a general reason as well. It is a problem confronting Japanese universities about academic writing education in general. That is, the education is not as popular as it should be. Call it the "popularity problem." Indeed, the problem is puzzling.

All university students in Japan, regardless of whether they are postgraduates or undergraduates, are required to write academic papers in one form or another. Be it a book review, research proposal, or technical report, no student could survive a university life without having any experience of writing an academic paper. At the very least, he or she will have to complete a dissertation in order to graduate from a university. Thus there is a practical requirement for every university student to learn how to write academic papers.

The requirement for producing academic papers is set even higher for postgraduate students, particularly those who are pursuing a doctoral degree. It has become almost a necessity for them to have one or two papers published during their course of study in order to proceed to writing their final dissertation. With the increasing demand for publishable papers, the need for the students to do something to improve the quality of their writings is becoming even more pressing.

Unfortunately, most university students have problems in academic writing. But even more unfortunately, they are not getting the proper training needed to solve the problems. Despite the academic writing requirement and demand, most of the universities in Japan are indecisive about academic writing education. By the time of writing this article, almost 99% of the 700 or more Japanese universities do not offer an academic writing course as a compulsory course. And only about ten universities are known to have writing centers officially established (Johnston, Cornwell, and Yoshida 2008). Why is this the case?

The answer to the question, as we shall see, amounts to a general explanation for why we need to incorporate logical thinking education into academic writing. Let me begin with a little history leading to the popularity problem.

2. A Limited Scope of Academic Writing Education

In my view, the reason that academic writing education in Japanese universities is not as popular as it should be is due to the limited scope of its implementation.

When academic writing as a program was launched in the mid 1960s by some state colleges and universities in the United States (e.g. CUNY), it was implemented as a remedial program for those students who were admitted to the state institutions under the open or relaxed admissions standards (Carino 1996). These open admissions students were "culturally diverse," and most of them were "underprepared" and lacked the competent language skills in academic writing. The goal of the writing education program was to teach them Standard English through some composition classes that focused on grammar drills.

Although academic writing education nowadays has made some significant advances from the original remedial program through the development of a wide range of writing supports (e.g. one-to-one tutoring, peer tutoring) aiming to fulfill a wide range of writing needs, teaching how to write academic papers in English is still being carried out as a part of English writing education in general. Most of the teachers hired to teach the writing course are English language teachers. And the teaching approaches being used still fall under the language education approaches.

For example, Richard Badger and Goodith White (2000) categorize all the known approaches to writing education into three basic categories: the "Product approaches," the "Process approaches," and the "Genre approaches." Despite their apparent pedagogical differences, all three writing approaches are approaches of English Language Teaching (ELT), and their primary objective is to teach students how to write well in English.

A major reason why academic writing education is still maintained as language education is because its education targets are still basically unchanged.

Nowadays academic writing education at university is popular mainly as a foreign language education program. Like many universities in the UK and USA, the top ranking Japanese universities are making great efforts to promote international education programs to attract more international students to come and study in Japan. As a result, there is a group of culturally diverse international students studying in Japanese universities, and they need to write academic papers in their second or third language. To be fair, the second language writers in Japanese universities also include the Japanese students who choose to write papers in English.

As far as these second language writers are concerned, they share basically the same difficulty in language use as the open admissions students who gave rise to the establishment of academic writing programs in the first place. For them, knowing how to properly use the second or third language is the primary difficulty in writing an academic paper in that language.

Accordingly, the solution to the problem encountered by the second language writers is the same as the open admissions students; namely teaching them how to use the language properly in writing.

3. The Popularity Problem Unfolds

If academic writing education is only carried out in the scope of language education, then there is an obvious problem about its popularity. The limited scope of academic writing education is not attractive for the majority of university students. Since academic writing education in Japan is basically designed to help students who write papers in a second or third language, it is not attractive for those students who write papers in their first language.

The majority of university students in Japan prefer to write papers in their first language. And most of them do not think that they have a very serious problem about how to use their first language. At least they do not want to spend their valuable university time to restudy the language that they have grown up with. For this reason, academic writing education is popular mainly as a foreign language education program for a minority of the students.

Because of the limited demand, the majority of Japanese universities do not provide academic writing education. Thus if academic writing education is only carried out in the scope of language education, it can hardly become a general curriculum for all university students even though there is a genuine need for the students to learn and improve academic writing.

However, there is a deeper reason why the education is not popular. It cannot deal with some principal difficulties that everyone encounters when writing an academic paper for some important academic purposes such as graduation and publication. The difficulties are to do with how people think, rather than how they use a language.

To begin with, there is a misunderstanding about the primary difficulties of academic writing. According to an article published by *The Higher Education Academy*, which provides advice to higher education teachers on how to teach academic writing to international students, "most writing specialists agree that writing difficulties are down to the 'specialised nature of academic discourse'" ("Academic Writing" 2013).

Given the context in which the article was written, this way of seeing the writing difficulties was clearly inspired by the experiences of those students who write academic papers in their second or third language. But it underestimates the depths of the writing difficulties viewed in a wider perspective.

Without any doubt, knowing how to properly use words and sentences is crucial to writing a good paper. As John Locke famously put it, "words signify ideas."[2] Thus it is necessary to know how to properly use the words in a language in order to convey your ideas using that language. However, merely knowing how to properly use the words does not guarantee that your ideas can be properly expressed. The rules governing the proper use of a language and the rules governing the proper arrangement of ideas are different, and they operate at different levels.

The rules governing the proper use of a language operate only at a sentence level, or how words are put together to form a grammatically correct sentence. However, in writing a good paper, we are required to know not only how words can be properly arranged in order to appropriately express the ideas, but also how ideas can be properly arranged so that they can be appropriately expressed through words. For convenience, call the former requirement *the Writing Requirement*, and the latter *the Thinking Requirement*.

Fulfilling the thinking requirement is of paramount importance to academic writing: you need to know how to properly arrange your ideas before you can properly express them in words. But unfortunately, most of the students have a problem with the thinking requirement.

Indeed, based on my years of teaching experiences in academic writing, I found that all the unsatisfactory writings have two things in common. By and large, all of them can be categorized into either writings that fail to deliver a clear thesis statement or writings that lack a convincing argument for the thesis statement; hence they are unable to convey what is in a writer's mind in a clear and convincing manner. These symptoms of unsatisfactory writings show that the difficulties in academic writing are not primarily due to a lack of language skills, but a lack of a proper training in logical thinking skills, or knowing how to think clearly and argue well.

4. Thinking Habits in Everyday Life Communications

The inability to think clearly and argue well is a general problem facing academic writers in all languages, regardless of whether they are writing in the native or a foreign language. This inability is inherited from an unfortunate habit of how we normally reason in everyday life communications.

We have a habit of conducting a rather "speedy" way of reasoning in everyday life communications. Everyday life communications are conversations, correspondences, discussions, and many other forms of socializations that we conduct with those people who we know, such as friends, family members, colleagues, and neighbors. When we communicate our thoughts under these circumstances, we normally do not express everything we know about our thoughts.

One obvious reason that contributes to the speedy process is the difficulty of adequately articulating some parts of knowledge in words. They are what Michael Polanyi (1966) called "tacit knowledge."

But in addition to the knowledge that is inexpressible, we have, more importantly, a habit of bypassing a lot of background information connected to those thoughts. For example, in everyday life communications it is very normal to hear someone – call him Peter – explaining to his father something like, "I cannot go to work today because my car broke down."

Clearly, Peter's explanation about his absence from work is neither clear nor convincing under logical scrutiny. It bypasses certain important background information that logically connects the conclusion, "Peter cannot go to work today," and the reason, "Peter's car broke down." If it were presented to those who do not share the background information about Peter and his everyday life, then many obvious questions would be invited. One obvious question is

---

[2] More precisely, words "signify the connexion that the Mind gives to Ideas, or Propositions, one with another" (Locke 1824, 409).

why Peter has to go to work by car. Peter could have gone to work by train or on foot or in many other ways. Another obvious question is why Peter did not repair his car or use another car, assuming that Peter must go to work by car.

What has been shown here by no means suggests that people should adopt a more careful and thorough way of reasoning in everyday life communications. This is how the communications have been done since the birth of mankind. And there are good reasons why they are conducted in such a speedy way. For instance, Gary Klein argues that it is impossible for people not to jump to conclusions because "we're wired for speed that way" (Klein 2010, 32).

Regardless of whether the reason is genetic or not, it is actually very normal for us to be speedy in everyday life reasoning. Since everyday life communications are usually conducted with people who share certain background information with us, we do not have to waste time and energy to spell out all the details when we communicate our thoughts. We can make assumptions and expect them to fill out the missing part with the background information shared. This is why Peter's explanation for not going to work would normally be acceptable without any question among those who share the background information with him. This is why people do not have to make so much effort in making their thoughts clear and convincing in everyday life communications.

However, the speedy way of reasoning would become a problem when we communicate our thoughts to those who do not know us, or those who do not share the background information connected with the thoughts we intend to communicate. For example, writing an academic paper for publication is a case of communication with people who are most likely outside of our social circle. In this case, if we continue to have the same assumptions and expectations as we always have in everyday life communications, then what we write in the paper can hardly be clear and convincing.

Converting from one way of reasoning to another is the real difficulty behind academic writing, and it is perhaps the most serious problem confronting the learning as well as teaching of academic writing. The problem is serious because most people do not realize that it is a problem. After all, a habit is a habit. It is not a problem per se.

Solving the problem, however, requires not only the realization of the problem, but more importantly a systematic training with a step-by-step guidance to develop a new habit of reasoning. In other words, in order to make the thoughts in an academic paper clear and convincing, one would have to change the habit of assuming what the readers should have known to making clear what the readers need to know to make the thoughts clear and convincing. Providing such training is where the limited scope of academic writing education fails. It is simply not what the language education is designed to do. This is, in my view, the real reason why the majority of the students and universities do not find the education attractive.

5. Logical Thinking Education

Hopefully by now I have made clear the problem that is challenging academic writing education in general. Teaching academic writing by merely teaching how to properly use the language cannot teach students how to think clearly and convincingly for their writing, simply because it cannot change their speedy reasoning habit.

But can we solve the problem by adding a logical thinking education into academic writing education?

Tom Gally, an invited speaker of the symposium on academic writing and critical thinking, argued that logic education cannot really help because it is also limited. Here is roughly what he argues in the paper written for his talk: in order for a logical argument to work, each of the premises in the argument must have a binary truth value, which must be either completely

true or completely false. But since the premises cannot be assessed as being simply true or false, "As a result, the tools of traditional logic, which depend on such binary truth values, are of limited use when teaching young scholars to write more effectively" (Gally, this issue).

The point that Gally makes regarding the requirement of a logical argument is correct. A logical argument does require its premise or premises to have a binary truth value, which must be either completely true or completely false. But it does not follow that the validity as well as the construction of the argument depends on premises that can be *assessed* as being simply true or false. As a matter of principle, whether a premise is *actually* true or not is regarded as technically irrelevant to the main task of logic. The main task of logic, traditionally speaking, is a study of the inferential relation between premise and conclusion in order to discern the principles or laws governing the relation.[3] For this purpose, practically all the truth values of the statements during the traditional studies are assumed, but not assured.

However, I do sympathize with Gally about the point that traditional logic is limited in teaching academic writing more effectively. In fact, I would go as far as saying that traditional logic is not even helpful in teaching academic writing. The endeavor of incorporating logical thinking education into academic writing is exploring an uncharted territory of not only academic writing but also logic.

Both formal and informal logic, contrary to what many people might think, are not designed to help one learn how to build a logical argument using one's ideas (Lai and Todayama, forthcoming). Aristotle's categorical syllogism, which represents the glorious accomplishment of classical logic, was basically an analytical study about what the proper structure of arguments should be. Gottlob Frege's quantification theory, which gave birth to the modern mathematical logic, was specifically designed as a critical tool for the study of the philosophy of mathematics and philosophy of language. Even the informal approaches to logic studies, notably led by Howard Kahane (1971), were to teach people what makes reasoning good by means of a critical study of what makes reasoning bad. All these traditional or conventional approaches set their primary goal in the studies of logic on the analysis of logical inferences to discern the rules and principles that can be used to distinguish between good and bad arguments. But they are not very useful in helping one learn the way of constructing proper logical inferences using one's own ideas.

There is a gap between argument analysis and argument construction. In the cases of analyzing a logical inference, statements from which the inference is drawn are usually provided. But in the cases of constructing a logical inference, people would normally have to start from nothing. In order to distinguish between valid and invalid arguments, one may simply memorize the valid forms of argumentation. But such memorization does not help one construct a logical inference from scratch, especially when one's own ideas are the subject of construction. Merely knowing how to distinguish between good and bad arguments does not give rise to knowing how to build a logical argument.

As I explained earlier, in order to help students make their thoughts in academic writing clear and convincing, we need to provide a systematic training with step-by-step guidance to help them develop a new habit of reasoning. This training is called the construction approach to teaching logical thinking, or constructive logic for short.

---

[3] Gottlob Frege, who is widely regarded as the founding father of modern mathematical logic, gave a now famous view about what logic does: "To discover truths is the task of all sciences; it falls to logic to discern the laws of truth. ... I assign to logic the task of discovering the laws of truth, not of assertion or thought" (Frege 1956).

6. Constructive Logic

There is not enough space here to give a full account of constructive logic. I shall only highlight what makes constructive logic special, and how it helps students to make their thoughts in academic writing clear and convincing.

Roughly, constructive logic is a study particularly about how an inferential relation between a premise and conclusion can be constructed. It is exclusively designed to help students from any academic discipline to develop the ability to think clearly and convincingly based on their own ideas. More specifically, under this approach a student will first learn how to establish and clarify the main idea of his or her research (i.e. conclusion), and then learn how to construct an inferential relation linking the idea to the supports of the idea (i.e. premises) so as to make the relation convincing. The entire construction process will start from scratch, and step-by-step guidance will be provided.

The key to building a practical and effective logical argument in constructive logic is to start from a conclusion, which is technically called the thesis statement[4] in academic writing.

To help students develop a thesis statement from scratch, a thesis statement recipe is provided. The recipe demonstrates how to establish a one-sentence research statement from something that is very broad, such as a keyword describing a very general research topic. Then through a series of steps of transforming the keyword to a sentence, and then to a question, and then to an answer to the question, a broad research topic is transformed into a preliminary thesis statement with a specific research focus.

One main advantage for starting with a thesis statement in academic writing is to help students get a clear idea about what they are going to write in a very early stage.

As I explained before, one of the most serious problems encountered in writing an academic paper is the failure to convey clearly what is in a writer's mind to the paper's readers. Normally, though not necessarily, if an academic writer is very clear about the central idea of his or her research, he or she should be able to state the idea in just one sentence. Accordingly, if the writer cannot state the central research idea in just one sentence, it is very likely that he or she is not very clear about his or her research. One part of the training that helps to clarify one's idea is therefore the training on how to summarize the idea into just one sentence.

Another part of the clarification training is learning how to eliminate ambiguities. The ambiguities here are associated with the research idea rather than the grammatical presentation of the idea. Indeed, during the early stage of the training, many students in my course tend to pay attention only to the sentence-level problem in building a thesis statement. They often overlooked the problems that arise beyond the sentence level, e.g. the ambiguities associated with the meaning of a sentence or sentence parts. For example, the sentence, "The bank is located in central London," is grammatically correct but not clearly specified. The meaning of the word "bank" is contaminated with what logicians call *lexical ambiguity* ("Introduction to Logic" 2002), since it can refer to either a financial institution or the side of a river (e.g. the bank of the Thames River). Thus the training on how to build a thesis statement is really training on how to think clearly.

The thesis statement built in the early stage is only a preliminary and unconfirmed intuition, or hypothesis. It will be subject to modification again and again during the entire writing process. The subsequent stage of premise building will serve to modify and finalize the thesis statement so that it can be turned into a confirmed conclusion in the end of the writing process. Writing the thesis statement is the first element to start in the process of writing an academic paper and building a logical argument, but it is also the last to finish.

---

[4] The term "thesis statement" is used interchangeably with "conclusion" in this paper.

Having built a preliminary thesis statement, the next important stage is to build an inferential relation that can link it to its supporting statements, or premises. Obviously, the purpose of building the inferential relation is to make the thesis statement convincing. This is the most difficult – though in my view, the most exciting – part of constructive logic.

It is difficult because it requires a way of making inferences that is radically different from the conventional approaches. In the conventional approaches, an inference is made from premise to conclusion. But making an inference in this way is boundless, simply because one can draw an infinite list of inferences based on any given premise. Although this is helpful for the logical analysis of understanding the principles and laws that govern the inferences, it is not very helpful for the logical construction. It is just like boarding a vehicle without knowing the destination.

From the perspective of constructing an inferential relation, it would be more effective to start from a conclusion. Going from conclusion to premise helps to draw a boundary in which the inference should be made. To understand how inferences are made within a boundary, consider how a crime investigation is conducted. Very briefly, in a typical crime investigation, the investigation will begin after a crime has been committed – e.g. someone has been killed, or some bank has been robbed. A careful study of the crime scene is very crucial, and it determines the rest of the investigation. The injuries found on the body indicate the weapon used to cause the injuries, the hair found on the floor identifies the person who was at the crime scene, etc.

In the same vein, building an inferential relation from a conclusion enables one to know what needs to be proven, and thus what needs to be done to deliver the proof. A careful study of a thesis statement provides good clues to the premise or premises needed to support the statement. For example, conclusion of a syllogistic argument is a combinatorial product of both of the argument's major and minor premise. The conclusion is composed of a major term and a minor term, which are the "architects" of the major premise and the minor premise respectively. A careful study of the conclusion, therefore, provides good clues to what the two premises should look like.

Building the premise or premises based on a conclusion is an important process of making the central idea in the writing convincing. The premise is the supporting reason for accepting a conclusion to be true. Thus the proper premise or premises for a conclusion will surely make the conclusion convincing. To help students build the premise or premises based on a thesis statement, a series of recipes on how to build a logical argument based on a thesis statement are provided. The recipes are categorized according to the types of arguments (so far there are four general recipes for deductive arguments, and four general recipes for inductive arguments). But the steps taken to build the premise(s) are basically the same.

Since the premise is the reason for accepting a conclusion, in order to build the premise for a conclusion, a straightforward step is to turn the conclusion into a why-question, and then seek the answer to the why-question. The answer to the why-question, after being summarized into just one sentence statement, is the preliminary premise for the conclusion.

However, merely providing a one-sentence answer to the why-question is not enough. There are many potential answers, and thus there are many potential premises. One must learn to single out the most relevant premise or premises in the process of answering the why-question. This is the most important step in learning how to make the idea convincing.

There are basically two methods to do it. One is about finding the common elements shared by both the conclusion and the premise(s). This method is especially useful for the construction of a categorical syllogism. The other method is about finding the necessary and sufficient conditions for the conclusion to be true. This method is especially useful for constructing an argument that exhibits a causal relation between the conclusion and the

premise(s). Both methods are equipped with recipes and templates that provide a step-by-step guidance. The details of these recipes require more space than is allowed for this paper.

7. Conclusion

This paper began by explaining why the academic writing education that focuses on language education is not attractive for the majority of academic writers. And it ended with introducing a logical thinking education that can help solve the prominent problems facing the majority of the academic writers; namely changing the habit of speedy reasoning to thinking clearly and convincingly. However, the intention of this paper is not to conclude that logical thinking education is better or more important than language education in academic writing. The real intention of this paper, which cannot be fully explicated in a short paper, is to find a proper way to incorporate the two approaches into academic writing education so that it can be developed into a full-blown general education curriculum for all university students in Japan. How exactly that can be done will be the burden of another paper.

References

"Academic Writing." 2013. The Higher Education Academy. http://www.heacademy.ac.uk/resources/detail/internationalisation/ISL_Academic_Writing

Badger, Richard, and Goodith White. 2000. "A Process Genre Approach to Teaching Writing." *ELT Journal*. 54(2), 153-160.

Carino, Peter. 1996. "Open Admissions and the Construction of Writing Center History: A Tale of Three Models." *The Writing Center Journal*. 17(1), 32-34.

Frege, Gottlob. 1956. "The Thought: A Logical Inquiry." *Mind*, New Series, 65(259), 289-291.

Gally, Tom. 2013. "On the Limitations of Language and Logic." NU Ideas 2(2), 11-17.

"Introduction to Logic." 2002. University of Oxford. http://logic.philosophy.ox.ac.uk

Johnston, Scott, Steve Cornwell, and Hiroko Yoshida. 2008. "Writing Centers in Japan." *Osaka Jogakuin College Journal* 5, 181-192.

Kahane, Howard. 1971. *Logic and Contemporary Rhetoric: The Use of Reason in Everyday Life*. Wadsworth.

Klein, Gary. 2010. "Jumping to Conclusions Can Make for Good Decisions." *Science News* April 9.

Lai, Wai Ling, and Kazuhisa Todayama. Forthcoming. "Why We Need a Construction Approach to Teaching Logic, and How it Should Be Implemented." *Contemporary and Applied Philosophy*.

Locke, John. 1824. *An Essay Concerning Human Understanding*. London: William Baynes and Son.

Murray, Donald M. 2004. *A Writer Teaches Writing*. Heinle.

Polanyi, Michael. 1966. *The Tacit Dimension*, Chicago: University of Chicago Press.