

## English academic writing difficulties of engineering students at the tertiary level in China

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**ABSTRACT:** English academic writing has long been Chinese university students' most awkward language skill, something which is especially true of engineering students. Since the *Excellent Engineer Education and Training Program* was launched at the tertiary level all over China in 2010, great emphasis has been placed on the cultivation of engineering students' English academic writing skills. In such an educational context, the present study was undertaken via a survey of 285 engineering sophomores, to gain a thorough knowledge of engineering students' difficulties in English writing. The findings indicate that the difficulties that engineering students have in English academic writing lie in three aspects, i.e. content, structure and language. It was also found that lack of language knowledge is the severest problem for engineering students to undertake writing tasks, with content presentation being the second difficult and structure planning the last. Hence, teachers are suggested to take into consideration engineering students' English writing difficulties, and take effective pedagogical measures to remove the barriers to successful academic writing.

### INTRODUCTION

Effective communication has been recognised as an essential skill for engineering graduates [1]. With the rapid development of international communication and cooperation, English writing plays an increasingly important role in intercultural written communication, and the cultivation of English writing skills has been gradually emphasised in engineering education.

In the context of China, English teachers devote considerable time and energy to helping students develop their writing competence, which, unfortunately, has proven to be ineffective. Although teachers have made arduous efforts to optimise all the teaching steps, including the design of writing topics, the organisation of classroom activities for writing and the correction of compositions, Chinese students have not made due improvements in their writing skills, and their writing has still been found to be the most awkward among all the four language skills, i.e. listening, speaking, reading and writing [2]. Accordingly, some studies have been conducted in China to explore what difficulties students have in academic writing [3][4]. Their research findings reveal that Chinese students' writing difficulties lie in various aspects, including colloquialism of language, inappropriate use of words, monotony of language use, Chinese style of discourse, empty content, etc.

However, the findings of previous studies are inconsistent and, moreover, they are mainly based on the analysis of students' compositions, with students' inner feelings ignored. Therefore, it is vital to know students' cognition and attitude toward their academic writing difficulties. Moreover, second language acquisition is a complex process, which is greatly influenced by a series of internal factors (e.g. aptitude, intelligence, age, gender, motivation, cognitive style and personality) and external factors (social context, family environment, educational background, classroom setting) [5]. Hence, learners from different educational backgrounds are certain to acquire a foreign languages with differential success and encounter different language learning difficulties. University students majoring in different disciplines are exposed to considerably different educational surroundings and academic environment, and as a result, they are bound to face different difficulties when they try to develop their English academic writing skills.

At present, the engineering discipline is significant in Chinese tertiary education, and great emphasis has been placed on the education of engineering students [6]. To meet social needs for qualified engineers, the *Excellent Engineer Education and Training Program* was launched at the tertiary level all over China in 2010 [7]. Intercultural communication skills have been identified to be critical for engineering graduates, and English academic writing has been considered as an essential skill for them to conduct international communication and cooperation. Hence, in order to better develop their English academic writing skills, this article aims to investigate the English writing difficulties of Chinese engineering students at the tertiary level.

## METHODOLOGY

### Research Subjects

The present research was based on a study involving 285 engineering sophomores from the University of South China. Their majors include electrical engineering, mechanical engineering and civil engineering, which are the mainstream of the engineering discipline in the context of Chinese tertiary education. The research subjects comprised 246 males and 39 females, which objectively reflects the gender proportion in Chinese university engineering education.

### Research Instruments

In the present research, a questionnaire survey was conducted as the main channel for collecting data. The design of the questionnaire items was based on the findings of a previous study conducted by Wang and Yu to survey Chinese university English majors' difficulties in English academic writing [4]. The questionnaire is a widely-used instrument with established validity and reliability. The questionnaire paper consisted of two parts. The first part collected personal information of the respondents, i.e. major and gender. The second part was made up of the 24 items to survey engineering students' English academic writing difficulties. The items covered the three main aspects of writing difficulties that university students are likely to be confronted with, among which items (1-7) measured students' writing difficulties in content, items (8-17) measured difficulties in structure and items (18-24) measured difficulties in language. Five choices were available for each item, with 1) indicating that a given statement is completely false for the respondent; 2) indicating that a statement is false much of the time; 3) indicating that a statement is sometimes true and sometimes false; 4) indicating that a statement is true much of the time; and 5) indicating that a statement is completely true.

### Data Collection and Analysis

The participants' English teachers were responsible for administering the questionnaire. Three hundred questionnaires were distributed and 285 valid responses were received, the response rate being 95%. The SPSS software package was used for processing the statistical the data from the valid responses.

## RESULTS AND DISCUSSION

### Engineering Students' Academic Writing Difficulties in Content

From Table 1, it can be seen that the greatest writing difficulty that engineering students have in the presentation of content lies in lack of depth and profundity (with its mean being 3.58). In addition, the learners also think that they have great difficulty in producing new and original ideas when undertaking English writing tasks (3.40). Moreover, engineering students need to spend too much time in planning content and forming ideas (3.34), and it is also hard for the learners to collect relevant materials (3.26) and find pertinent examples (3.24) in writing.

Additionally, their writing is sometimes empty in content (3.02). In spite of all these difficulties, it is rare for learners to feel *wordless* in writing (with its mean being 2.91, lower than 3.00). Chinese university engineering students' difficulties in generating informative, profound and creative ideas can partly be ascribed to the overemphasis of practical skills and the neglect of humanistic quality in engineering education.

Table 1: Means and standard deviations of items on students' writing difficulties in content.

Items	Mean	SD
When I write a composition,		
1. I feel I have nothing to say about the topic.	2.91	0.86
2. I need a long time to ponder what to write.	3.34	0.85
3. I cannot find enough materials for writing.	3.26	0.90
4. I lack original ideas, and it is difficult for me to convey something new.	3.40	0.87
5. I cannot find good examples to illustrate my point.	3.24	0.88
6. My composition is devoid of substance.	3.02	0.84
7. My composition lacks depth and profundity.	3.58	0.83

### Engineering Students' Academic Writing Difficulties in Structure

From Table 2, it can be seen that there are relatively fewer and slighter difficulties for engineering students to structure passages, for in this part, the means of seven items are lower than 3.00 and the other three are slightly higher than 3.00. To be specific, engineering students have some problems in the structure planning of the text (including how to start and end the passage), cohesion of sentences and paragraphs, presentation of thesis statements and topic sentences, but such difficulties are not too severe and their occurrence is not frequent.

Table 2: Means and standard deviations of items on students' writing difficulties in structure.

Items	Mean	SD
When I write a composition,		
8. I do not know how to plan the structure.	2.98	0.81
9. I do not know how to start it.	2.95	0.91
10. I do not know how to end it.	3.03	0.89
11. I am not able to make it organised.	2.80	0.84
12. I cannot clearly and directly express my ideas.	3.01	0.83
13. I fail to write a clear thesis statement for the article.	2.74	0.82
14. I fail to write a clear topic sentence for the paragraph.	2.72	0.83
15. The article has a loose structure.	2.87	0.81
16. There are no transitional sentences to connect paragraphs and their cohesion is unnatural.	3.07	0.85
17. The connection between sentences in the article is unnatural.	2.91	0.80

#### Engineering Students' Academic Writing Difficulties in Language

From Table 3, it can be seen that engineering students have tremendous writing difficulties in terms of language use. The greatest language barrier to writing comes from the lack of lexical resources. Owing to the lack of vocabulary, engineering students find it impossible to achieve lexical variety in writing (4.10), and lexical limitation also prevents them from fully expressing their ideas (4.08). In their writing, their vocabulary is so small that they cannot make full use of synonyms to enrich the expression (3.85), that they cannot find appropriate lexical items to accurately convey messages (3.77), and that they even have to give up some intended ideas (3.43). Moreover, due to lexical difficulties, sometimes they need to turn to literal translation in English writing (3.06). Despite lexical difficulties, engineering students do not often look up words in the dictionary (with its mean being 2.92, lower than 3.00).

Table 3: Means and standard deviations of items on students' writing difficulties in language.

Items	Mean	SD
When I write a composition,		
18. I feel my vocabulary is not large enough to fully express what I want to convey.	4.08	0.82
19. I fail to find proper words or phrases to accurately express my ideas.	3.77	0.89
20. I have to use the same words repeatedly, for it is difficult for me to find their synonyms to express the same meanings.	3.85	0.86
21. I have to spend much time consulting the dictionary for proper words to accurately express my ideas.	2.92	0.94
22. I have to abandon some ideas that I want to express, just because I cannot find pertinent words.	3.43	0.90
23. I have to literally translate the Chinese meaning I want to express into English, just because I cannot find pertinent words in English.	3.06	0.93
24. I fail to achieve lexical variety.	4.10	0.80

#### A Contrastive Analysis of the Three Variables of Engineering Students' Academic Writing Difficulties

Table 4 presents the main descriptive statistics (i.e. mean and standard deviation) of the three variables on students' writing difficulties. This table vividly illustrates the significant differences in the three aspects of writing difficulties that engineering students are very likely to experience. It is very clear that engineering students have the greatest difficulties in language use (3.60), content difficulties are ranked the second (3.25), while difficulties in structure are the slightest (2.91).

Hence, according to engineering students' self-perception, language, especially vocabulary, is the greatest barrier to successful academic writing and they think the limitations of their lexical knowledge have hindered the development of their writing skills. In addition, they also find it difficult to be productive, creative and critical in terms of content presentation when undertaking a writing task. Finally, the learners do not think of structuring a passage in writing as a too demanding task.

The results from the present study are consistent with the findings of the research conducted by Wang and Yu, in which English majors in China perceived that in English academic writing, language use was the hardest aspect for them, followed by content and then structure [4]. However, it is noteworthy that university engineering students' difficulties in academic writing in all the three aspects are far greater than those encountered by English majors and other types of university students in China, because engineering students usually have been offered more courses, theoretical or practical than arts and science students, and they are usually burdened by a heavier academic workload. Thus, they have less time to concentrate on English learning and writing practice [8].

Table 4: Means and standard deviations of the three variables on students' writing difficulties.

Variable	Writing difficulty in content	Writing difficulty in structure	Writing difficulty in language
Mean (standard deviation)	3.25 (0.67)	2.91 (0.60)	3.60 (0.64)

## CONCLUSIONS AND SUGGESTIONS

The present study conducted a survey on Chinese university engineering students' self-perceived difficulties in English academic writing, and its findings indicate that the students, as English as a foreign language (EFL) learners, when undertaking writing tasks, are likely to experience barriers in several aspects including content, structure and language. Their greatest difficulties in English academic writing lie in the use of English language and in the process of English writing. The presentation of content also poses a big challenge for engineering students, while they consider their problem in structure to be less severe.

Based on the findings stated above, the present study puts forward the following pedagogical suggestions:

Firstly, when teaching English academic writing, the teachers should take into serious consideration the learners' great difficulty in language knowledge and, moreover, they should adopt teaching strategies to remove their language barriers. Engineering students' English level is usually lower than that of other types of learners at the tertiary level owing to the fact that they are offered more demanding practical courses and that they have less time to engage in English learning. Therefore, teachers are recommended to elaborately select model compositions before the writing task, which can provide meaningful reference for students and can serve as comprehensible input [9].

When students are exposed to the sample articles, teachers should guide them to pay attention to the language features in the model compositions, and urge them to process the useful language items and store them into their memory [10]. Moreover, students should be encouraged to use new words, expressions and sentence patterns that they have acquired, thus, promoting their vocabulary acquisition and linguistic competence. Vocabulary acquisition is a long and complex process, and only through considerable language intake and usage can engineering students eliminate the language barriers to successful English writing.

Teachers should also pay attention to engineering students' difficulties in generating ideas, and they should take effective measures to stimulate the learners' thinking. Teachers are recommended to design interesting or thought-provoking topics for writing tasks. Furthermore, since engineering students tend to lack humanistic literacy and critical thinking, teachers can organise some advance activities, such as literature reading, discussion, debate and speech, to inspire engineering students to have critical thinking and generate creative ideas [11].

Finally, the teachers should raise engineering students' awareness of planning writing structure in English. According to the survey, the students did not take seriously their problem in structure. As a matter of fact, there are tremendous differences in discourse structure between English and Chinese and, thus, many EFL learners in China tend to transfer the Chinese style of organising paragraphs and passages to English academic writing [12]. Therefore, the teachers are recommended to make clear to students the great differences in discourse structure between English and Chinese, and help students to develop their ability to think and write in English.

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## REFERENCES

1. Staehle, M.M., Reed, A.R., Benavidez, H.S. and Riddell, W.T., Communication-based learning objectives in a four-year engineering curriculum: a longitudinal analysis. *Global J. of Engng. Educ.*, 17, 1, 7-13 (2015).
2. Xu, F., *Teaching and Researching English Writing*. Beijing: Foreign Language Teaching and Research Press (2012).
3. Lei, L. and Wei, Y., An empirical study on writer's block of Chinese EFL learners at the tertiary level. *CELEA J.*, 30, 5, 13-18 (2007).
4. Wang, W. and Yu, X., A survey of learners' self-perceived difficulties in L2 writing. *Foreign Language Learning Theory and Practice*, 1, 31-35 (2008).
5. Larsen-Freeman, D. and Long, M.H., *An Introduction to Second Language Acquisition Research*. Beijing: Foreign Language Teaching and Research Press (1991).
6. Yan, C., Research-oriented English teaching of engineering majors at regional Chinese engineering colleges based

- on the idea of steps. *World Trans. on Engng. and Technol. Educ.*, 12, 4, 753-758 (2014).
7. Wu, Y., Training mode and mechanisms for the excellent engineers programme. *World Trans. on Engng. and Technol. Educ.*, 12, 4, 701-705 (2014).
  8. Bao, W., Research on college English teaching based on intercultural communication in engineering universities. *World Trans. on Engng. and Technol. Educ.*, 12, 2, 191-195 (2014).
  9. Krashen, S., *The Input Hypothesis*. Hong Kong: Longman Group Limited (1985).
  10. Chen, L., On the function of models in English composition instruction discussed in the light of reading writing relationships. *Foreign Languages and their Teaching*, 4, 28-29 (2001).
  11. Chen, Y., Shen, F. and Gao, Y., On cultivation of humanistic quality through college English teaching in universities of science and technology. *Shandong Foreign Language Teaching J.*, 30, 2, 56-59 (2009).
  12. Kirkpatrick, A., Traditional Chinese text structures and their influence on the writing in Chinese and English of contemporary mainland Chinese students. *J. of Second Language Writing*, 6, 3, 223-244 (1997).