Engineering Excellence in Technical Writing: The Case for Complete Program Redesign

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Outline
- Overview of Center for English Language Education in Science and Engineering (CELESE)
- A Brief History of English Programs at Waseda University, Faculty of Science and Engineering
- CELESE Technical Writing Program
  - assumed knowledge / course goals
  - materials / classroom procedures
  - sample student writing
  - student feedback

Overview of CELESE
- Center for English Language Education in Science and Engineering (CELESE)
  - Founded: April, 2004
  - Members: 6 tenured faculty / 2 visiting lectures
  - Students: all undergraduates and graduates in the Faculty of Science and Engineering
  - Mission: carry out research, and design and administer English courses specifically for science and engineering students

A Brief History of English Programs in Sci. & Eng.

~2003
Old Curriculum
English I, English II,
Advanced English, English Forum

2004–2006
Transition Curriculum (FS)
English I, English II,
Advanced English, English Forum

2007–
New Curriculum
Communication Strategies 1/2
Academic Lecture Comprehension 1/2
Academic Reading 1/2
Concept Building and Discussion 1/2
Technical Writing, Technical Presentation
Special Topics in Functional English

Overview of CELESE English Program

~2003
Old Curriculum
English I, English II,
Advanced English, English Forum

2004–2006
Transition Curriculum (FS)
English I, English II,
Advanced English, English Forum

Features of English I
- in-class text chosen by teacher
- self-study materials chosen by English faculty
- standardized testing of self-study materials
- grading determined TOEFL

Features of other courses
- all aspects of course decided by course teacher
Overview of CELESE English Program

Features of new curriculum
- All courses are designed by CELESE faculty
- All courses are carefully integrated into an overall English language program for scientists and engineers
- All courses are based on established theories of language learning
- All course teaching is subject to peer review

New Curriculum
- Communication Strategies 1/2
- Academic Lecture Comprehension 1/2
- Academic Reading 1/2
- Concept Building and Discussion 1/2
- Technical Writing 1/2
- Technical Presentation 1/2
- Special Topics in Functional English

Overview of CELESE English Program

Assumed Knowledge (acquired in earlier courses)
- Research skills
  - Developing a research proposal, finding information through library and web searches, ethics in writing (plagiarism and how to avoid it), references/citation
- Writing skills
  - Basic sentence/paragraph writing
  - 500-word summary of academic lectures (chronology, definitions, process, ...)
  - Basic three-five paragraph essay
  - Short word research-based report
- Vocabulary
  - Most frequent 2000 words of English (JACET 2000)
  - Academic word list (Coxhead, 2000)

Course Goals
- Learn how to identify and adopt the writing conventions of the target field
- Research paper title, abstract, introduction, methods, results, discussion, citations, references
- Simple/extended definitions, explanations of tables/graphs, biographic data, email, ...
- Develop strategies for acquisition of technical vocabulary
- Utilize text analysis tools in the analysis and writing of research articles and other technical documents
- Corpus linguistics in the classroom
Technical Writing 1/2

Materials / Classroom Procedures

- Stage 1: Understanding audience, purpose, organization, style, presentation
  - authentic materials selected from native English high school/university textbooks, letters of acceptance/rejection, ...
- Stage 2: Applying Stage 1 skills to the target language
  - scientific/engineering magazine articles (IEEE)
  - student centered analysis of target journals
- Stage 3: Writing for publication
  - student centered writing of research paper title, abstract, introduction, methods, results, discussion

Sample Writing (First class of Technical Writing 1)

4th year student abstract

Outline:
I would like to research dynamic properties of ancient architecture.

Our laboratory, which I would like to belong to, researches collapsing process for heritage structures of Japan. Such research is helpful to preserve heritage structures, and also it can suggest how to extend the life of architecture. I think.

Sample Writing (Final class of Technical Writing 1)

4th year student abstract

Sample Writing

1st year student writing at start and end of Academic Lecture Comprehension 1

Student Feedback on Technical Writing 1

- "I could study the basis of reading and writing. It helped me very much for both searching related works and writing papers. The strategy was useful in English and even in Japanese!"
- "We could learn how to write technical report. We do not have time to learn that even if Japanese, it was very useful. Thank you."
- "Your advice in this class has really changed my thinking about English."
- "Your lecture was very interesting. I think that writing skill especially improved thanks to your lecture."

Summary and Conclusions

Engineering a technical writing program involves:

1) Considering the needs of students and the goals of an integrated set of courses
2) Determining what classroom materials, teaching procedures, and testing procedures can be used to attain the goals
3) Working within the constraints of the program in terms of human resources, technical resources, student ability, university policy
4) Negotiating with specialist faculty and the university to reduce the number of constraints by addressing issues of scheduling, class hours, teaching loads, ...
5) Establishing a program of teacher training for both full-time and part-time faculty
6) Understanding that no program is perfect from the start, and that it requires regular assessment and adjustments