

Project Title : Mastering the Technical Vocabulary of STEM

Leading University : The Hong Kong University of Science and Technology

Participating UGC-funded University(ies) : The Hong Kong Polytechnic University

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Summary of Proposal

The project aims to develop resources for students of science and engineering and their teachers to support the learning and use of technical vocabulary. University English enhancement courses in Hong Kong tend to focus on academic English. Unfortunately, it is often assumed that students do not require assistance with technical language since this will be acquired during the study of content courses. However, recent research suggests that the role played by technical vocabulary in specialized texts has been significantly under-estimated. Technical vocabulary can account for a very large proportion (often over 30%) of the words in a text. The challenges represented by technical vocabulary in science, technology, engineering and mathematics (STEM) content areas, particularly for second-language (ESL) students, are also receiving special recognition globally. Some studies suggest that the heavy load of technical vocabulary may even contribute to science avoidance by students.

The project addresses the above problems by creating learning resources based on technical words that are judged by Engineering and Science faculty to be important, including words known to be difficult for students. The resources (OLR) will be available to students on-line and take the form of interactive activities which are both motivating and effective for learning. The activities are presented as self-paced learning objects, with an initial diagnostic quiz which directs students to one of three levels of challenge based on their existing knowledge of the vocabulary of their discipline. The resources will also be promoted to teachers for integration into STEM-related language

courses. The learning resources are intended to develop students' ability to use technical vocabulary correctly both in written and spoken English. Ten STEM disciplines will be included.

Before the learning resources are created, the project first identifies technical vocabulary that is judged to be relevant and important for Hong Kong university students by Engineering and Science faculty. The first stage of the project involves the creation of ten subject-based corpora and ten subject-based vocabulary lists. The materials in the OLR are based on the vocabulary of the wordlists.

Summary of Final Report

The project aims to develop resources for students of science and engineering and their teachers to support the learning and use of technical vocabulary. University English enhancement courses in Hong Kong tend to focus on academic English. Unfortunately, it is often assumed that students do not require assistance with technical language since this will be acquired during the study of content courses. However, recent research suggests that the role played by technical vocabulary in specialized texts has been significantly under-estimated. Technical vocabulary can account for a very large proportion (often over 30%) of the words in a text. The challenges represented by technical vocabulary in science, technology, engineering and mathematics (STEM) content areas, particularly for second-language students, are also receiving special recognition globally. Some studies suggest that the heavy load of technical vocabulary may even contribute to science avoidance by students.

The project addresses the above problems by creating learning resources based on technical words that are judged to be important or difficult for students. The resources are available to students online and take the form of interactive activities which are both motivating and effective for learning. The activities are presented as self-paced learning objects, with an initial diagnostic quiz which directs students to one of three levels of challenge based on their existing knowledge of the vocabulary of their discipline. The learning resources are intended to develop students' ability to use technical vocabulary correctly both in written and spoken English.

The project was presented at local and international conferences, including the Learning and Teaching @EdUHK Festival Conference Day, the HKCPD Symposium, and the HKCPD Hub International Conference. These presentations, jointly delivered by the HKUST and PolyU project teams, were well received by the audience, some of whom

provided feedback and suggestions on the types of resources to be developed.

Two end-of-project webinars and workshops were conducted, which were opened to all Language Centre teachers in UGC-funded universities. Two eminent scholars in vocabulary acquisition, Professor Michael McCarthy and Professor Laurence Anthony, gave plenary speeches at the webinars, which were each followed by a workshop to introduce the project resources to the participants.

The project deliverables are: 10 subject-based corpora, 10 subject-based technical wordlists, a diagnostic quiz, learning objects for all subject areas, and teacher guidelines. All these resources will be available to all UGC-funded institutions.