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Correlation of Written Test Scores and Presentation Ability in Science English Learning

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Short Communication

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Abstract

We investigated the correlation between written test (WT) scores and presentation ability (PA) of Japanese university students learning science English (SE). Year-2 university students (n=173) divided into groups of 3-4 each were asked to present their respectively allocated portions of a certain topic (chapter) from their textbook in class (contents: biology, chemistry, and physics). Students were required to enhance their presentation contents of their respectively allocated sections in each chapter via journal references and online information-search. Each student had to perform the tasks of English presentation, Japanese translation, and pointing of illustrations on a rotation system. Lecturers scored the PA of students based on pronunciation, flow, volume, grammar use, contents, Japanese translation of presented contents, illustration provision and support of presented contents during their presentations (total score: 80). In tandem with presentations, a WT assessing understanding on the presented chapters, grammars, and English-expression/translation of given Japanese contents (total score: 100) at the end of each topic presentation. Questionnaire data from 6 classes designated for a half-year semester were cumulatively pooled for data analysis. PA scores were plotted against WT scores for each topic for analysis. The results of 3 topics indicated a positive WT-PA scores correlation, suggesting that oral presentation enhanced writing ability in SE.

Keywords: oral presentation, written test, presentation-test correlation

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1. INTRODUCTION

Science English (SE) requires understanding, learning, and acquisition of various science-relevant technical terms and content-specificities.[1-4] An approach espousing active-plus-deep learning was adopted for pharmaceutical science (PS)-orientated students to learn SE, because the terms, expression, and materials are content-specific and are entirely different from

ordinary literary English.

Recently, presentations of various topics in different disciplines have become routine in many universities, albeit Japanese is the major medium used in the practices. Oral presentations on different topics enabling presenting students to read and understand materials from various sources written in science English (SE) are rare. Our present study investigated if Japanese students could read, understand, interpret, and enhance the content of given sections of a topic through oral presentation. In tandem with the presentation, written tests were conducted to correlate if a certain relationship existed between these two learning activities.

2. SUBJECTS and METHODS

Year-2 university students (n=173) of either gender pursuing a 6-year pharmacy degree course were divided into groups of 3-4 each, and asked to present their respectively allocated portions of a certain topic (total: 3 topics or chapters comprising biology/life science, chemistry and physics) from the textbook[5] using a microphone[5] in class. Each chapter was presented in full by 9-11 students (3 chapters, comprising either biology, chemistry, or physics) were presented in all by 28-30 students within a 4-lecture session (1 session for guidance and explanation; 3 sessions for presentation) before the class moved on to be guided by another lecturer of a different discipline (classes were conducted in a rotation system). Students were required to enhance the presentation content of their respectively allocated sections in each chapter by referring to journals and the internet. Students spent at least 1 week for preparing the relevant materials/contents of their presentations: translating English contents to Japanese, practicing prounciations of words/numerals and Greek/Latin symbols, checking grammar, making relevant illustrations, and other relevant materials. Each student in rotation had to perform the specific roles connected with 3 aspects of the presentation: (i) oral English presentation, (ii) Japanese translation, and (iii) illustrative support (pointing out relevant parts of figures in synchronization with the presented contents). Students were guided by 3 lecturers with respective specialties of biology/life science, chemistry, and physics.

Lecturers scored the PA of students based on pronunciation, flow, volume, grammar use, contents, Japanese translation of presented contents, illustration provision and support of presented contents during their presentations (total score: 80). In tandem with presentations, a WT assessing understanding on the presented chapters, grammar, and English-writing ability based on given Japanese contents (total score: 100) was given in lecture 9 (i.e. at the end of 2 separate guidance/explanation sessions and 2 x 3-chapter presentation sessions: i.e. 8 lectures), and then another WT tailored for the students was given in lecture 14 (one lecture for guidance/explanation; three lectures for presentation sessions: i.e. four lectures). This scheduling was designed to correspond to the total allocation of 14-lecture sessions. The WT tested students on their understanding of SE grammar and technical terms, content-based knowledge, and English-Japanese translation. When the PA and WT scores were graded for the three topics by the 3 lecturers, the PA scores were plotted against the WT (paper test) scores.

3. RESULTS

Students – via active learning - presented their contents using additional illustrations (not found in the textbook) reflecting printed textbook contents[6] to facilitate understanding of listening students of the presentation contents. The illustrations were either self-drawn based on their understanding, and/or sourced from reference materials involving deep learning. Apart from comprehensive presentation derived from the textbook contents, almost all students added extra relevant information and needed illustrations sourced from journals, reference books, and online publications. Sourcing for relevant illustrations and additional useful information involves deep learning.

Based on the plots of the WT vs PA scores, positive correlations were shown in all 3 topics (Fig. 1-3), and although the PA-WT score correlation in the physics class (Fig. 3) was slightly more scattered compared to PA-WT score correlations for biology/life science (Fig. 1) and chemistry (Fig. 2), a general positive correlational tendency was noted.

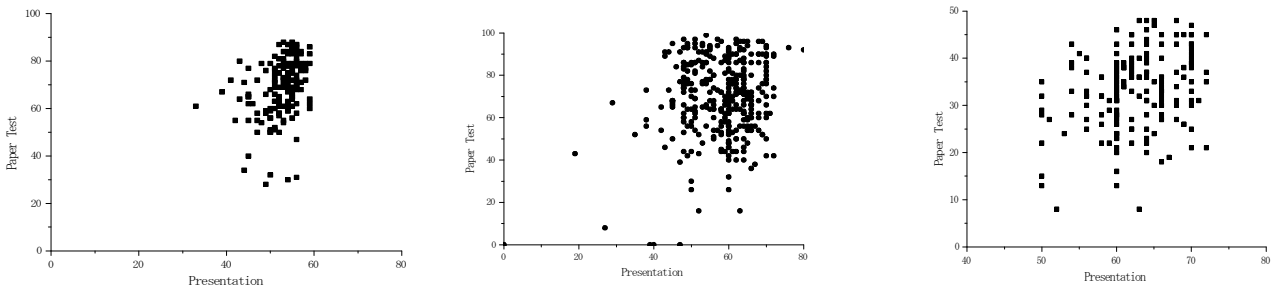

Fig. 1: Correlations of presentation ability (PA) scores (Abscissa) vs written test (WT) scores (ordinate) of biology (left), chemistry (middle), and physics (right). The correlations of PA vs WT scores were positively portrayed in biology/life science and chemistry. Although the PT-WT correlation in physics was slightly in a disarray, the general tendency of a positive correlation was noted.

4. DISCUSSION

Japanese students are generally poor in speaking everyday English, especially talking for SE presentations.[1] Apart from its use to name, record, compare, explain, analyze, design, evaluate, and theorize how the natural world appears to us,[7] SE is a form of English for special purposes (ESP) required for expressing observations, reasoning, valuation, analysis data, and routine communication in content-oriented disciplines, with functional use of technical terms, typical expressions, materials, and tools[8] relevant to transmitting scientific concepts and discoveries.[1,9-11]

Oral presentation of topics is a useful approach to spur reading and speaking abilities in ESL (English as a second language) learners. Students, especially those in our present study who were doing oral presentation in SE for the first time, are required to be given appropriate guidance and essential elements in presentation.

Oral presentation involved reading or reciting the presentation text and whenever and wherever attention is needed, indicating visual material to focus listener attention on certain information provided via illustrations. Understanding the content in their own language (i.e. Japanese in this case) is of course important in doing a proper presentation and for the ESL students listening. Therefore, our present study endeavored to provide the necessary first-step information on how to do an oral presentation, and we had each student perform 3 roles connected with the 3 aspects of giving a presentation: (i) oral English presentation, (ii) expression/translation in Japanese, and (iii) illustrative support (pointing out relevant parts of figures in synchronization with the presented contents) on a rotation system. By the end of the group presentation, each student would have experienced these 3 roles.

Our study instigated students to express their interpretation of phenomena and data as well as their own thoughts in SE before their peers in a manner such that those listening would understand their presentation. At this young stage of their SE learning, Japanese translation followed the English presentation was necessary to reinforce understanding in the listening students of the orally presented contents. This also enables presenting students to read, understand English in materials from various sources, and then interpret in Japanese: i.e. learning English-Japanese translation.

Apart from building self-confidence in oral SE presentation,[12] the most important purpose of this study was to spur students to approach a topic and enhance the content with back-up references: a scientific approach to understanding phenomena, data interpretation, and information dissemination. In addition, whatever they could understand in their mother tongue would be able to be disseminated for the benefit of others by using SE once they could perform Japanese-English expression/translation. Presentations with all the above-mentioned scoring indexes were important elements in giving an effective presentation and in being appreciated. Our findings demonstrated that presentations facilitated their confidence in speaking SE, and understanding of written SE contents. Correlations of PA vs WT scores were positively related for biology/life science, chemistry, and physics, although certain scattering appeared in physics due to probable decreased interest and lack of prior exposure of students to the topic. The performance of the students in this one exceptional group was probably due to their inadequate high-school education on physics, as some did not take up physics then, or due to other reasons that warrant further studies.

In conclusion, the present presentation involving 3 roles for each student to perform aimed to nurture ESL learners in oral presentation using active-plus-deep learning. This novel approach is practical for large class-sizes to expose each student to oral presentations with useful acquisition of presentation content with illustrative support via active-plus-deep learning, as shown by the positive PA-WT correlation in the learning process.

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