A Study of the Relationship between Tested English Proficiency and Academic Writing Performance

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This study was conducted as part of the Academic English for Science (AES) course development at a private university in Japan. The work is a preliminary study on factors that relate to academic writing proficiency. Although there are many factors that need to be taken into account in developing an effective academic writing curriculum for English as a foreign language (EFL) learners, this initial study examined the relationship between general English ability and writing achievement. The results showed a moderate correlation between scores from standardized testing of general English skills and academic writing ability. The correlation coefficient from class achievement and student average CASEC total scores was $r = 0.30$. Results revealed that students with high CASEC scores (760 and above) performed well in writing classes while performance of students with low to intermediate English scores varied. Future research to inform academic writing course development should consider other factors such as academic background and teaching methodology in addition to tested linguistic skills.

Key words: EFL, scientific writing, academic writing, course development, English proficiency

1. Introduction

Academic writing proficiency for English as a foreign language (EFL) learners has been found to be related to linguistic skills, cognitive development, and educational experiences1. However, it is often perceived that poor academic writing performance is mainly due to EFL learners’ lack of grammatical and vocabulary competency2. Therefore, teaching grammar and various language features has been the main focus of many research studies on academic writing3.

On the other hand, many studies pointed out that linguistic issues cannot be used as the sole factor to account for EFL academic writing proficiency4,5. Scientific writing (a form of academic writing), in particular, involves conducting research, assessing information, and analyzing data in addition to conveying information through writing. Thus, other contextual factors such as critical thinking skill and academic background are also important to consider in the design of courses that teach academic writing to science and engineering students.

In Japan, English is taught in secondary schools with an emphasis on reading and grammar. Students learn how to write by using grammar and translation-based methods6. Teachers focus on language knowledge and test-taking skills while students concentrate on what they have learned in class, especially grammar, rather than on generating ideas and expressing themselves7. This method of teaching may allow students to perform well in English proficiency tests, however, high test scores do not necessarily lead to success in academic writing. This teaching method, which omits the critical thinking process, may account for the low performance in academic writing commonly seen at the university level8.

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In order to develop a successful academic writing course for science and engineering students, it is important to understand factors that contribute to their academic writing success. Although there are many factors to be considered, for example, English communication skills, academic background, critical thinking skills, and teaching methodology, this study focused on the relationship between student tested English ability and their performance in an academic writing course. Students’ vocabulary and grammatical skills were determined by using their CASEC total scores; the students took the CASEC three times during an academic year. Their scores were correlated with their achievement in the Academic English for Science (AES) course. Understanding the relationship between student pre-existing linguistic skills and the degree to which they influence writing proficiency is a key step in evaluating the effectiveness of the current AES course and will provide valuable information to guide further course development.

2. Method

2.1 Data collection

Data were collected from 368 students who had taken three CASEC tests and were enrolled in one of the AES classes offered during the 2016, 2017, or 2018 academic years. All students were majoring in science or engineering. The AES course curriculum included at least two basic scientific experiments for students to conduct. These experiments allowed students to collect data in order to write scientific reports on the results. Evaluation of the course was largely based on the reports. The AES course final grades were used as the measure of academic writing performance in this article while CASEC total scores were used as the measure of pre-existing English ability. The university's undergraduate course grades are given in five levels: A, B, C, D, and F, with D or higher as pass and F as fail. For the present study, students who received a grade of F were excluded from analysis because most of these students essentially dropped the course (but did so after the official drop deadline).

2.2 Data analysis

For data analysis, classes were categorized into six groups (Group 1 through Group 6) based on the instructor the students studied under. Three CASEC total scores for each student were used. Pearson regressions were performed on CASEC scores and AES final course grades. Correlation coefficients were calculated to determine the relationship between student tested English proficiency and their academic writing performance for each AES group and for all groups combined.

In addition, to evaluate the academic writing performance at different CASEC score ranges, average CASEC scores were grouped into five proficiency levels as shown in Table 1. These levels are based on CASEC’s description of scores and English ability. CASEC describes language proficiency at six reference levels ranging from AA (most advanced) to E (beginner). Each level is defined by what a learner can do. Levels AA and A have the same capability description, so the two levels were combined and considered as one level in this study. AES performance trends were then evaluated by determining student writing achievement at each CASEC level.

Table 1. Grouping of CASEC scores.

<table>
<thead>
<tr>
<th>CASEC score</th>
<th>Proficiency level</th>
</tr>
</thead>
<tbody>
<tr>
<td>760 and above</td>
<td>High</td>
</tr>
<tr>
<td>600-759</td>
<td>Intermediate-high</td>
</tr>
<tr>
<td>450-599</td>
<td>Intermediate</td>
</tr>
<tr>
<td>390-449</td>
<td>Intermediate-low</td>
</tr>
<tr>
<td>0-389</td>
<td>Low</td>
</tr>
</tbody>
</table>

Finally, to assess the consistency of CASEC performance, the highest total score among the three
CASEC tests for each student along with the percentage change in scores between tests were also determined.

3. Results

The correlation coefficients ($r$) from regression of the three CASEC test scores and their average with the six groups of AES classes, as well as all classes combined, are shown in Table 2. The correlation between average CASEC test scores and writing performance in the overall AES course was 0.30. Pearson $r$ values for different AES classes (i.e., instructors) and CASEC scores taken at different times of the year ranged from -0.09 to 0.46; if the smallest two groups (which were taught by part-time instructors) are excluded, the range is from 0.27 to 0.46.

Fig. 1 shows the percentage of students receiving each grade (A, B, C, & D) at different CASEC proficiency levels. There is a trend that the percentage of students obtaining a grade of A increased with higher CASEC levels. The results also show other grades (B, C, & D) are distributed somewhat randomly among students with low to intermediate CASEC scores.

Table 2. Sample sizes ($n$) and correlation coefficients between AES course performance and CASEC scores.

<table>
<thead>
<tr>
<th>Class</th>
<th>$n$</th>
<th>1st CASEC</th>
<th>2nd CASEC</th>
<th>3rd CASEC</th>
<th>Average CASEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>116</td>
<td>0.28</td>
<td>0.34</td>
<td>0.27</td>
<td>0.31</td>
</tr>
<tr>
<td>Group 2</td>
<td>99</td>
<td>0.38</td>
<td>0.45</td>
<td>0.46</td>
<td>0.46</td>
</tr>
<tr>
<td>Group 3</td>
<td>100</td>
<td>0.36</td>
<td>0.35</td>
<td>0.36</td>
<td>0.38</td>
</tr>
<tr>
<td>Group 4</td>
<td>13</td>
<td>-0.09</td>
<td>0.01</td>
<td>0.08</td>
<td>0.00</td>
</tr>
<tr>
<td>Group 5</td>
<td>16</td>
<td>0.11</td>
<td>0.16</td>
<td>0.22</td>
<td>0.17</td>
</tr>
<tr>
<td>Group 6</td>
<td>24</td>
<td>0.29</td>
<td>0.29</td>
<td>0.39</td>
<td>0.34</td>
</tr>
<tr>
<td>All groups combined</td>
<td>368</td>
<td>0.27</td>
<td>0.31</td>
<td>0.28</td>
<td>0.30</td>
</tr>
</tbody>
</table>

Fig. 1. AES performance (i.e., AES final letter grade: A, B, C, or D) for different CASEC levels.
The number and percentage of students who obtained their highest CASEC score among three different tests are shown in Table 3. The result shows that the highest score was spread evenly across the three tests; thus, students do not (on average) appear to improve, or perform more poorly, across multiple CASEC examinations (the typical time between first and third test was 10 months).

A comparison of the changes in CASEC scores that students obtained from three different tests taken during an academic year is shown in Fig. 2. As can be seen in the figure, student performance on CASEC tests varied. The percentage change of scores for the majority of students, however, is within a ±10% range.

Table 3. Distribution of highest scores from three CASEC tests.

<table>
<thead>
<tr>
<th>Highest score in test 1</th>
<th>Highest score in test 2</th>
<th>Highest score in test 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>n (number of scores)</td>
<td>121</td>
<td>122</td>
</tr>
<tr>
<td>percent of total</td>
<td>32.88</td>
<td>33.15</td>
</tr>
</tbody>
</table>

Fig. 2. CASEC performance comparison from three tests.

4. Discussion

In this study, the relationship between student prior English ability, based on CASEC scores, and their performance in an academic writing course was examined. Since student performance on CASEC tests varied during the year, the average scores from three CASEC tests are used for this discussion. Although many studies have shown that the major challenge in academic writing for EFL students is the language barrier, our results only suggest a moderate relationship between student tested English ability and their academic writing performance. The magnitude of the correlation
coefficients ranged from 0.00 to 0.46 among classes taught by six instructors. From the results, it is clear that students who had high English proficiency (CASEC > 760) performed better than students with intermediate- or low-level CASEC proficiency. However, the relationship between writing performance and the tested English skills for students with intermediate and low CASEC scores is inconclusive. Many intermediate-level learners produced academic reports with as high quality as more advanced learners. Students with low CASEC scores also were able to attain a good grade in the AES course. These results support the conclusion that academic writing proficiency depends not only on tested English ability but also on other factors.

Some factors that should be considered for future academic writing study include teaching methodology and pre-existing English proficiency that includes assessment of writing skill. Data for the present study were taken from AES classes that were taught by six different instructors. Teaching methodology could be one of the factors that led to different writing performance in different groups. Academic writing requires students to analyze data and to convey their understanding or ideas via words. Different instructors incorporated critical thinking into their academic writing classes to different extents. Teaching EFL learners to both think in a logical manner and then transform their thoughts into academic prose is essential for an academic writing course. Therefore, this factor should be taken into account for future analyses.

The four sections of CASEC tests focus on vocabulary, conversational expression, listening, and dictation. There is no writing section in the CASEC test. Thus, CASEC may not be a good representation of overall English proficiency. Future work should consider a measure for English proficiency that includes English writing skill to relate the linguistic factor more accurately to academic writing performance.

5. Conclusion

In this paper, the relationship between English proficiency (using CASEC performance) and academic writing skills was investigated. The results show that there is a moderate correlation (overall \( r = 0.30 \)) between CASEC total scores and academic performance in the Academic English for Science (AES) course. Nevertheless, English ability assessed by CASEC scores cannot be used as the only factor to predict writing success as it explained less than 10% of the variability in AES grades (overall \( R^2 = 9.2\% \)). In cases where students have low English ability, the contributions of other criteria such as critical thinking skills, teaching methodology, and scientific background may contribute more to success in academic writing. Incorporating multiple factors is necessary for academic writing course development.

References


