

Developing Academic English for the New Curriculum at Tokai University

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Summary

This paper is part of a larger research effort at developing a new academic English language program for the School of Agriculture at Tokai University. The purpose of this paper is to investigate differences in levels of student interest and difficulty when comparing the standard Tokai University general education textbook readings with readings for which the content was specifically chosen to be more closely aligned with agricultural sciences, namely for students majoring in agriculture (Plant, Animal and Bioscience). The results reported are based on a statistical analysis of questionnaire data gathered twice (time 1 and time 2) from three classes of intermediate level students (time 1, $n = 80$; time 2, $n = 74$) from both the first (one class of agriculture and one of non-agriculture majors) and second year (agriculture majors). Results indicated that agriculture students are more interested in reading agriculture related materials than the standard general readings offered in the required English courses, while for students in non-agriculture majors, there was no difference in interest levels.

1. Introduction

The 2018 academic school year will bring with it the introduction of two new English courses to the School of Agriculture at Tokai University. The courses to be added are called “Academic English” and “Global Skills”, and they will form a large part of the required English program. Academic English is defined by the Tokai University Educational Council (1) in broad terms to refer to the development of Academic subjects based on a cooperative effort between the English Language instructors and the academic subject instructors. Global skills, on the other hand, refers to the skills required of a global citizen, which in the contexts of English language education is being interpreted as integrative skills such as those necessary to give and actively take part in presentations in an English context. Anticipating this change to the curriculum, Rodriguez-Yagi and Minor (2) explored methods for the development of an appropriate Academic English course. First, as it is a subject which is to be

developed in cooperation with professors of agricultural courses, they conducted a preliminary needs analysis in the form of a questionnaire survey. The results showed that agriculture teachers wanted the students to master basic vocabulary, grammar, and translation skills. Some teachers also indicated a need for students to learn to effectively use dictionaries and WEB translation techniques. While this may not seem commensurate with the turn to greater emphasis on communicative English in Japan (3), it is important to remember that the requirements of students in the science-related fields often relate to accessing information in international research which of course is most frequently in English. The skills required for this are relatively aligned with what the respondents requested in the survey administered by Rodriguez-Yagi and Minor to teachers of agriculture.

A needs analysis was performed, after which a literature review was conducted which resulted in *content-based instruction* (4-8) being judged as most appropriate to the learner context of the School of Agriculture. Pursuant to this research trajectory, a small-scale pilot class was conducted in fall 2015 (2). The outcome of the pilot class was judged to be positive based on student and instructor feedback. However, one limitation of the pilot study was that the students were self-selected, and thus it may have been that their levels of

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English proficiency and motivation were not on par with the levels of many of their classmates. As Academic English will be a required subject, which students of all levels must take, it was necessary to conduct a larger scale multi-class pilot study, which is the subject of this paper. In spring 2017, a larger team of researchers took part in conducting this more extended pilot study on Academic English in Tokai University's School of Agriculture.

The purpose of this study was essentially threefold. First, it was necessary to determine whether material aligned with a content-based approach (4-8) would be considered preferable to existing materials, and this was taken to be an issue strongly aligned with the students' level of interest in the materials. Second, it was important to begin to at least engage with the issue of difficulty of material, given the limitations of the previous pilot study (2), even if the pragmatic constraints on this, given the need to conduct the study within the classes available, prevented a comprehensive engagement. Third, and given the different study tracks of students who will take the Academic English course, it was also important to examine how prior knowledge might affect students' perspective on new materials. It was anticipated that this issue would overlap with the issue of student interest in potential materials. Given these three overarching aspects of interest, a study was designed with the agenda of providing evidence-based conclusions with respect to them. One overall difficulty was that there were limited options for the design given the dual challenges of working within the groups available, i.e. groups constituted through the existing educational, institutional and curricular parameters, as well as maintaining respondent anonymity.

2.0 Design and Research Questions

There were three main research questions for the study which pertained to each of the main survey items and these covered level of interest, difficulty and familiarity/prior knowledge, respectively. The responses on these items comprised the dependent variable. The two material types (Material Sample 1 and Material Sample 2) comprised different levels of the independent variable (i.e. type of material) in a within-group design at Time 1 and Time 2. The within-group design, however, came without matched pairs (i.e. participants could not be tracked from Time 1 to Time 2), and this was due to the exigencies of maintaining anonymity

for the participants. There was also some minor change in the participants at Time 1 and Time 2 due to absences etc. The main groups for the analysis therefore, and in terms of which each RQ was addressed, were the following:

- a) Entire Sample A single dependent sample by design, but with unmatched pairs, responding at Time 1 [n = 80] and Time 2 [n = 74], to Material Sample 1 and Material Sample 2, respectively, and treated as statistically independent samples due to the lack of matched pairs.
- b) Teacher Subsamples Two separate subsamples comprising the students in each of the administering teachers' classes. Each subsample was dependent by design but with unmatched pairs, responding at Time 1 and Time 2. Teacher 1 had responses at Time 1 (n = 25) and Time 2 (n = 26). Teacher 2 had responses at Time 1 (n = 55) and Time 2 (n = 48). In each subsample, Time 1 and Time 2 responses were treated as statistically independent due to the lack of matched pairs.
- c) Study Track Subsamples Two separate subsamples comprising students in the School of Agriculture (ag) and in the School of Industrial and Welfare Engineering combined with the School of Business Administration (eb). Each subsample was dependent by design but with unmatched pairs, responding at Time 1 and Time 2. Ag had responses at Time 1 (n = 55) and Time 2 (n = 48). Eb had responses at Time 1 (n = 25) and Time 2 (n = 26). In each subsample, Time 1 and Time 2 responses were treated as statistically independent due to the lack of matched pairs.

There were three research questions which were as follows:

RQ1

Is there a significant difference in the level of interest for the Regular Reading (Material Sample 1) and the *Cowspiracy* (Material Sample 2) for the three groups (a, b, and c)?

RQ2

Is there a significant difference in the perceived level of difficulty for the Regular Reading (Material Sample 1) and the *Cowspiracy* (Material Sample 2) for the three groups (a, b, and c)?

RQ3

Is there a significant difference in the level of familiarity with, or prior knowledge of, the Regular Reading (Material Sample 1) and the *Cowspiracy* (Material Sample 2) for the three groups (a, b, and c)?

3.0 Method

Given that the study was conducted within the existing class allocation system, random sampling was not possible. The study was conducted with three intact classes, and was therefore based on a sample of convenience.

3.1 Participants

Two Reading and Writing 1 intermediate classes and one Reading and Writing 2 intermediate class participated. One of the Reading and Writing 1 classes was not from the School of Agriculture (ag) but rather from the School of Industrial and Welfare Engineering combined with the School of Business Administration (eb). The classes are designated as RW1ag, RW1eb, and RW2ag. It was decided to include the class from the Schools of Industrial and Welfare Engineering and Business Administration to ascertain if the result is specific to the students' major.

For the Material Sample 1 lesson, RW1ag had 27 students, RW1eb had 25 students, and RW2ag had 25 students. For the Material Sample 2 lesson, RW1ag had 25 students, RW1eb had 26 students, and RW2ag had 26 students. The range of the placement test results was 40-47 (RW1ag), 33-39 (RW1eb), and 42-49 (RW2ag). The placement test is given to new students during the orientation period in the beginning of April. The questions on the test are multiple choice with 30 grammar, 30 listening, and 40 reading questions. The grammar section involves filling in blanks in 30 single sentences. The listening section consists of three parts. The first part has 20 short dialogues, each one followed by a question, the second part is a longer conversation with five questions, and the last part is a lecture with five questions. The reading section has four passages with ten questions each.

Based on the placement test results, students are streamed into one of three levels, namely, Basic, Intermediate, or Advanced. All of the RW1ag, RW1eb, and RW2ag class students had been placed into the intermediate level as determined by the Tokai English placement test. Students were further divided into class 1 and class 2. RW1ag and

RW1eb were made up of the second highest level of first year class 2 students at School of Agriculture and School of Industrial and Welfare Engineering combined with the School of Business Administration. RW1ag students were compliant to the teacher's instructions, and worked well both individually and in small groups. The RW1eb class students displayed a wider range of responses to the teacher's instructions, from very responsive to somewhat reluctant. Many worked well both individually and in small groups, but others were less active in the classroom. The atmosphere of the RW2ag students was generally quiet and serious, and it was often a challenge for the teacher to get them to talk freely and collaborate with each other, though they were friendly and polite in general. On a one to one basis, the teacher would notice that some students were much more talkative and easy going.

3.2 Material

Each class used two kinds of material. The first was a chapter from the regular reading textbooks (9, 10) and the second was *Cowspiracy* (11). The RW1 regular reading is from Chapter 5 of the reading textbook, *Select Readings - Elementary Book A* (Oxford), and was titled "A City Without Oil". The RW2 regular reading is from Chapter 12 of the reading text book, *Select Readings - Elementary Book B* (Oxford), and was titled "Protecting Culture and Traditions".

Cowspiracy was selected as it was among the materials used in the small-scale pilot class. Furthermore, the topic was related to agriculture, which makes it viable as material for Academic English in the School of Agriculture. *Cowspiracy* is a documentary film and the reading material talks about what kind of film it is, what kind of impact it had on young people, and the background of the film. According to the Tokai University syllabus, the target level for RW1 Intermediate is CEFR (12) A2 and for RW2 Intermediate is CEFR B1, while *Cowspiracy* is set at CEFR B1 (13).

3.3 Procedure

Teacher 1 taught one class of second year intermediate students majoring in agriculture, while teacher 2 taught two first year classes of intermediate students, one class which was of agriculture students and the other which was of business or engineering students. After the Material Sample 1

lesson and again after the Material Sample 2 lesson, students were given a questionnaire utilizing a 5-point Likert-scale to measure students' perception in three areas, namely interest, difficulty, and familiarity. Ratings of 5 indicated the highest interest, the least difficult, and the most familiar, while ratings of 1 indicated the lowest interest, the most difficult, and the least familiar.

4.0 Results

The results for this study are divided into two sections, namely, descriptive statistics (Section 4.1) and inferential statistics (Section 4.2). The descriptive statistics section covers the means (as a measure of central tendency) and the standard deviations (as a measure of score spread) for scores on the Likert-scale items (Questions 1, 2 and 3). In addition, the skew and kurtosis for scores generated on the three Likert-scale items are also reported. The inferential statistics section covers a series of statistical tests (Mann-Whitney U Test) designed to adjudicate the research questions posed by the study. Due to the absence of matched pairs – a limitation mentioned above in the section on research questions – dependent measures statistical tests could not be used, because they require such matched pairs. The Mann-Whitney U Test, for ordinal scales on the dependent variable, was used by treating the dependent groups as independent groups. The analytical consequence of this is that statistical power was sacrificed, and a beta error or Type II error (i.e. the error of incorrectly retaining the null hypothesis, or a false negative) becomes more likely.

4.1 Descriptive Statistics

There were cases of potential patterned responses in the dataset, i.e. where students responded in the same way for all questions. This appeared to occur more often for the industrial and welfare engineering and business administration students. However, given the limited number of questions it was not possible to confirm this completely, and no data was excluded.

Table 1 below presents the means, standard deviations, and critical ratio for skew and kurtosis for each of the Likert-scale items appearing in the research questionnaire which was completed by participants ($N=154$, for each item). This includes the responses obtained for both the Regular Reading (Material Sample 1) and the alternative *Cowspiracy* (Material

Sample 2), and the purpose of their combined summation in Table 1 is to describe general tendencies across question type rather than by material type (for the latter see Table 2 and 3 below). From the means presented in Table 1, it is clear that there was a general tendency to respond more positively to Item 1 (Interest question) than to Item 2 and 3 (Difficulty question and Familiarity/Prior Knowledge question), and this tendency is evident independent of the material type (Material Sample 1 or 2) which presents as the object for the rating response. With respect to standard deviation, Item 1 was somewhat higher than for the other two items. All results for skew and kurtosis were acceptable; if not meritorious in some cases (e.g. Item 2 for which both skew and kurtosis was very low). Skew for Item 1 was somewhat high, but was not above an absolute value of 2 which would be the start point for a questionable level of skew.

Table 1. Means, Standard Deviations, and Critical Ratio for Skew and Kurtosis for Items on Survey Questionnaire (both Material Samples Combined)

	N	Mean	Std. Deviation	Critical Ratio for Skew	Critical Ratio for Kurtosis
Item 1	154	3.46	.923	-2.00	0.60
Item 2	154	2.82	.896	-0.38	-0.02
Item 3	154	2.70	.879	-1.29	-0.83
Valid N	154				

Tables 2 and 3 present the means, standard deviations and critical ratios for skew and kurtosis for the same scores on the Likert-scale items, but by material type. Table 2 presents the results for the Regular Reading (Material Sample 1) and Table 3 the results for the alternative *Cowspiracy* (Material Sample 2).

Table 2. Means, Standard Deviations, and Critical Ratio for Skew and Kurtosis for Items on Survey Questionnaire (Material Sample 1, Regular Reading)

	N	Mean	Std. Deviation	Critical Ratio for Skew	Critical Ratio for Kurtosis
Item 1	80	3.34	.913	-1.95	0.29
Item 2	80	2.88	.891	0.12	0.46
Item 3	80	2.70	.906	-1.14	-1.15
Valid N	80				

Both Table 2 and Table 3 present results which follow the same general pattern as those presented in Table 1; with Table 1 having represented the combination of the results seen in Table 2 and 3. The mean for Item 1 is considerably higher

than the means for Item 2 and 3 in both Table 2 and Table 3. However, this elevation of mean for Item 1 with respect to the other two items is more pronounced in Table 3 (Material Sample 2; *Cowspiracy* Reading) than in Table 2 (Material Sample 1, Regular Reading); although this difference is reported here as an observation by inspection rather than a difference supported by statistical inference.

Table 3. Means, Standard Deviations, and Critical Ratio for Skew and Kurtosis for Items on Survey Questionnaire (Material Item 2, *Cowspiracy* Reading)

	N	Mean	Std. Deviation	Critical Ratio for Skew	Critical Ratio for Kurtosis
Item 1	74	3.59	.920	-1.03	0.54
Item 2	74	2.76	.904	-0.65	-0.44
Item 3	74	2.70	.856	-0.67	0.22
Valid N	74				

Notable observations about the standard deviations, with respect to Table 1 and 2, would include the relatively larger difference in standard deviation for scores across Material Sample 1 and 2 on the third item (i.e. Item 3 which related to prior knowledge); and this despite the mean being precisely the same in both cases. With respect to skew and kurtosis, there are no salient observations to be made. All values for the critical ratio were acceptable.

4.2 Inferential Statistics

The results for all executions of the Mann-Whitney U Test are reported below, and these include results for each of the three Likert-response items and for each of the groups (a, b and c) identified in the research questions. The alpha level, or significance level, was set in advance at .05, and thus inferences below are associated with a 95% confidence level.

4.2.1 Entire Sample (a)

For a Mann-Whitney U Test involving the entire sample at Time 1 ($n = 80$) and Time 2 ($n = 74$), no significant differences were found across Material Sample 1 and Material Sample 2 for any of the three items. Times 1 and 2 were treated as statistically independent groups given that respondents could not be tracked across these two administrations of the research questionnaire, and therefore pairs could not be matched. The loss of statistical power means that false negatives are a possibility. Speculatively, this

would most likely be the case for Item 1 where the p value was .134 and the closest to being below the alpha level of .05. Nonetheless, on the power which was available to statistical testing, the results all indicate no statistical differences.

4.2.2 Subsamples by Teacher (b)

When the Mann-Whitney U Test was conducted within the two teacher groups/subsamples (i.e. once for Teacher 1's students and once for Teacher 2's students), it was found that level of interest (Item 1) did produce a significant result for Teacher 1's students across Material Sample 1 at Time 1 (Mean = 3.48) and Material Sample 2 at Time 2 (Mean = 4.00). No other significant differences were found for the other evaluation items (Items 2 and 3) in Teacher 1's subsample, and there were no significant results at all for Teacher 2's subsample. Again the problem of having unmatched pairs forced the treatment of groups, which were dependent by design, as statistically independent groups, and the same qualifications with regard to statistical power apply.

The statistically significant result for the Teacher 1 subsample on Item 1 needs to be interpreted with caution because student assignment to Teacher 1 and Teacher 2 was not balanced in terms of either size or study track. Teacher 1's subsample ($n = 51$) included only the School of Agriculture students (RW2ag), while Teacher 2's subsample ($n = 103$) included both the School of Agriculture (RW1ag) students ($n = 52$) and the School of Industrial and Welfare Engineering combined with the School of Business Administration (RW1eb) students ($n = 51$). Thus the significant difference obtained here for Teacher 1's subsample on the level of interest (Item 1) is less likely related to a teacher variable, and more likely related to a study-track variable which expresses itself unequally across the two teachers due to imbalance in student assignment. The results in Section 4.2.3 below corroborate this cautioning.

4.2.3 Subsamples by Study Track (c)

In this analysis, the Mann-Whitney U Test was conducted within the two study-track groups/subsamples (i.e. once for RW1ag and RW2ag students and once for RW2eb students, using Time 1 and Time 2 in each case as statistically independent groups given that pairs could not be matched). For the School of Agriculture students (subsample) a significant difference was found with respect to level of interest (Item 1) across Material Sample 1 (Mean = 3.49)

and Material Sample 2 (Mean = 3.85). The p value was .043 and thus less than the alpha level of .05 set in advance. This indicates that this subsample found Material Sample 2 (*Cowspiracy*) more interesting, and this inference can be made at the 95% confidence level.

The results here bear on the results immediately above (Section 4.2.2), because Material Sample 2 (*Cowspiracy*) is thematically related to the study-track of the agriculture students, and therefore more likely to be of interest to them. The significant difference obtained above on the same item (Item 1) in Teacher 1's group, but not in Teacher 2's group, is arguably because Teacher 1 only had students from the School of Agriculture while Teacher 2 also had students from the engineering/business track for whom there was no significant difference in terms of Item 1 or level of interest.

5.0 Discussion

In the small-scale pilot class conducted previous to this study, only eight self-selected students, whose placement test scores were in the range of 38-66, participated (2). This range of scores is higher than the typical placement test scores of most intermediate level students. It was anticipated that the material used in the pilot class, *Cowspiracy*, might be too difficult for use in a regular size intermediate class. However, the difficulty level did not appear to be a problem as evidenced by the results obtained in this study with a larger sample. There was no significant difference in the students' perception of difficulty between Material Sample 1 and 2.

The participants in this study were not self-selected, as had been the case in the previous study. However, there were indications that for the subsample of students from the School of Agriculture, *Cowspiracy* was more interesting than the regular reading. It is important to reiterate that the significant result obtained for level of interest within the Teacher 1 group but not within the Teacher 2 group needs to be interpreted with caution. The result here is arguably a proxy for the result obtained by study track, because the agriculture study track was more heavily represented in participant group taught by Teacher 1. This was a design limitation in this study, but not a design limitation which could be avoided given the strictures of conducting the study within the curriculum and with intact classes.

As the new curriculum is emphasizing Academic English which is related to the students' major areas of study, readings

such as *Cowspiracy* may be more appropriate for students in the School of Agriculture. The results obtained in this study do provide preliminary evidence that students from the School of Agriculture were more interested in the reading which aligned with their field of specialization. This can be claimed with relative confidence because the statistical procedure employed, given the properties of the data and design constraints, if anything, lacked statistical power. This essentially means that a false negative (Type II error) presents as more of a possible problem than a false positive (Type I error). Put another way, the statistical tests were not very sensitive given the constraints, and it is possible that real differences were not actually detected by the tests.

6.0 Future Research

In this study, the students from second highest level class (based on the placement test results) were chosen to participate. Their placement test scores ranged from 33 to 49. The very bottom class scores ranged from 19 to 32. Future research should be conducted with the lowest levels as well. One consideration involved in this would be to adapt the reading material to be easier. Another consideration would be the manner of delivery of the material. The teaching methodology may require modification in the case of lower-level classes; i.e. making more use of Japanese and relying more heavily on a grammar-translation approach. The approach adopted by the professors of agricultural sciences in the "Reading Academic Papers in English" course is highly associated with the grammar-translation method. Therefore, it might be beneficial for students if they started to follow this kind of approach for Academic English as well.

At present, the Ministry of Education is promoting the teaching of English through English, which is well-known. However, a questionnaire administered to the agriculture teachers did not show satisfaction with the present English education at Tokai University's School of Agriculture. Using the Academic English classes as a bridge between the general education English classes and the more specialized "Academic Paper Reading" classes, could be one way to scaffold the transition and provide students with a more secure footing across these two aspects of the curriculum. A more graduated approach facilitated by the Academic English classes could thus facilitate more confidence and motivation on the part of students.

This paper indicated that agriculture students are more interested in reading agriculture related materials than the standard general readings offered in the required English courses. In future research, it will also be important to explore other teaching methodologies in addition to using the grammar-translation approach, as well as exploring materials for various difficulty levels for use in both basic and intermediate classes.

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