

## **The Online Teacher's Assistant: Using Automated Correction Programs to Supplement Learning and Lesson Planning**

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### **Abstract**

This paper will focus on the use of several online software programs that streamline the process of finding and correcting student errors, helping educators pinpoint key areas for instruction. Using smartphones or computers, students input assignments into an online form, which is then sent to a spreadsheet. The teacher can then easily assess assignments manually as well as by using a variety of automated grammar/language tools. Based on the results, the teacher can tailor lesson plans specifically to address the more common errors of a given class. The information also assists the instructor in correcting submissions and can help students individually monitor and improve their writing. These programs can save educators time and resources as they quickly assess and identify problematic areas. This paper will help educators begin to implement these useful online tools in their own classes.

### **Method**

During the course of their Freshman English class, a sample set of 17 Asia University Business Hospitality students completed a total of 135 book summaries containing 4,830 words and approximately 650 sentences over the course of the Spring 2013 semester. The information was gathered during the

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course of the Asia University Freshman English intensive reading course's weekly reading assignment. This information was then assessed using several programs which checked for grammar, spelling, and word choice. In this course I require students to read seven to ten books throughout the semester and, using their smartphone or computer, electronically input and send their work to me. While the weekly book report assigned to the students includes a variety of questions, for this particular data gathering process only, one section of their weekly Book Report (Book Summary) was analyzed.

The methodology for this paper comes from the relatively new field of Natural Language Processing. "Natural Language Processing (NLP) is an area of research and application that explores how computers can be used to understand and manipulate natural language text or speech to do useful things" (Chowdhury, 2003). Student data has been analyzed using three different web-based applications (grammarly.com, paperrater.com, and writewords.co.uk) which measure word frequency, phrase frequency, various grammar errors, and spelling mistakes. I collected the data using Google Forms and Microsoft Excel.

Google Forms is a free online tool that allows users to input information and collects it in a spreadsheet. It is useful for teachers to help gather information from students for a variety of activities and assignments. In the intensive writing aspect of an ESL/Writing course, it provides numerous benefits, most notably the ability to access all student responses in one place. This allows educators to easily view and correct the information as well as adapt lesson plans to strengthen common class mistakes.

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Google Forms has a variety of organizational and visual features that make it ideal for classroom use. Time stamps for student-generated submissions can help simplify the grading process for teachers. Also, by using the *Summary of Responses* feature, the user can view a variety of graphs and information. For example, with multiple choice questions, Google Forms can create a graph of student responses based on each question. This can be used as a visual aid in the classroom to convey to students their problematic areas by showing a bar graph of the class's answers. Using the graph, the teacher can immediately focus on questions which had the most incorrect answers. With the use of online error correction programs, teachers now have access to a variety of tools that can identify spelling, lexical, and grammar issues. This paper will take the sample set of student assignments and discuss the implications based on these three areas.

Once the students submitted their weekly book report, the submissions were input into the Google Forms spreadsheet, which was then exported to several programs.

The first, Grammarly, is an online proofreading website that can be used to scan documents for grammar mistakes. According to its website, "Grammarly scans your text for proper use of more than 250 advanced grammar rules, spanning everything from subject-verb agreement to article use to modifier placement" (Grammarly, 2013). It also offers style-specific correction for a variety of different types of writing. In this particular study, the "Student/Academia" setting was used to assess student writing samples. The site also offers "context optimized synonyms" and an "Adaptive

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SpellChecker” which claim to offer both spelling and word choice suggestions based on content. Another feature of the site is plagiarism detection, which checks writing against a database of eight billion web pages.

By taking the entire data set and running it through Grammarly, I discovered patterns of common mistakes made by students. Grammarly sorted through the sample set, checking for spelling, grammar, punctuation, and style/word choice. From the fifteen pages of student-generated input, it created a forty-page analysis of areas to improve. By no means is it an exhaustive list of all errors created; however, it illustrated topics which the class could benefit reviewing.

To obtain a more comprehensive analysis of the student's' writing samples, I used writewords.org.uk, Microsoft Excel, and paperrater.com to discover word frequency and other pertinent data. Writewords.org.uk is a website designed for professional writers designed to help with proofreading. These tools sorted through the document to discover the most commonly used words, which I then classified manually by part of speech. I then aggregated the data using a Microsoft Excel spreadsheet to discover the average number of words per assignment students had submitted. Additionally, Writewords has a function that counts the frequency of phrases. The user can set the counter to find the most commonly used two-to-ten-word clusters. Combining these tools allows educators to assess student vocabulary and create activities (based on its results) to encourage expansion.

Paperrater.com offers a similar service to Grammarly in that it also acts as an online proofreader.

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PaperRater is designed by linguistics professionals and graduate students. According to its website, "PaperRater combines the power of natural language processing (NLP), artificial intelligence (AI), machine learning, information retrieval (IR), computational linguistics, data mining, and advanced pattern matching (APM)" (paperrater.com). PaperRater provided interesting word usage statistics, including verb types used and parts of speech used to begin sentences, I chose to use Grammarly's reports because its software highlights areas for improvement and sorts mistakes into categories based on type. These software tools, when combined, were able to process a semester's worth of written class work in approximately two minutes. They created detailed summaries of student errors and habits. Over the course of about an hour, Grammarly was able to create individually tailored reports for the entire class. This is in contrast to the several hours (or potentially days) an instructor would need to manually correct and categorize errors. With these programs it is possible to tally and gather information that would prove to be monotonous and inordinately time-consuming otherwise.

### **Data**

The study sample consisted of seventeen students who, over the course of sixteen weeks, electronically submitted 135 book summaries totaling 4,830 words. On average, students submitted forty-seven words per assignment to summarize their reading. Students were directed to write a minimum of three to four sentences per book summary. The most common errors, according to Grammarly, were in the areas of punctuation (178), spelling (79), sentence structure (55), articles (45), and passive voice (45).

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According to Writewords.org the most commonly used nouns were *story* (33), *one* (31), and *day* (28). The most common verbs (counting all tenses) were *be* (232), *go* (63), and *have* (33). The most commonly used adjectives were *old* (20), *big* (17), and *strange* (13). Lastly, the most commonly used adverbs were *very* (23), *about* (17), and *finally* (9).

Writewords's phrase frequency counter listed the most common three-word phrases as "This story is" (13), "to go to" (11), and "this book is." The most common four-word phrases were "this story is a" (8), "there was a man" (4), and "story is a story" (4). Phrase frequency dropped as the number of word clusters increased past five. However, an interesting pattern began to develop of students who had either copied assignments or plagiarized from the book. Setting the phrase frequency counter to five- or six-word clusters yielded several identical phrases, which were indications of duplicate submissions. (See the Discussion section for a more in-depth analysis of plagiarism patterns.)

According to PaperRater, the vast majority of sentences were started with a pronoun (152). Considering the Grammarly software indicated the high incidence of punctuation errors in student writing, this is notable because it indicates students associate punctuation with pronoun usage. The second most common occurrence after pronouns was starting sentences with a conjunction (45). Paperwriter went a step further and dissected sentences, reporting that of the total work submitted, 11% of the writing included pronouns and 10% included a preposition.

## Discussion

After analyzing writing samples using these programs, I was able to better address the needs of my classes. The most glaring errors discovered by both Grammarly and PaperWriter were that not only are students over punctuating, but they have formed a pattern between punctuation, conjunctions, and pronouns. From analyzing the report Grammarly provided, it was evident that students are starting a disproportionate number of sentences with coordinating conjunctions. It is possible the mistake stems from an L1 transfer error, since the class comprises only Japanese students and the error rate is high.

However, one pattern that was not reported and is evident from a short review of the writing samples is the high frequency of mistakes involving irregular past tense verbs. While Grammarly cites these as spelling mistakes, in fact they are usage mistakes and misrepresented in the report the software generated. This is an example of an error that was mislabeled and could be better handled by the teacher manually correcting the work.

Yet another useful pattern that emerged was in making use of the WriteWords phrase frequency counter. Plagiarism and/or copying of assignments are easily discovered by running the five-or-more-phrase word counter. I was able to identify at least three instances of copying/plagiarism in a matter of seconds by looking at the results of the check. While Grammarly checks assignments against Internet sources, it does not have this peer comparison functionality. One of the pitfalls of electronically submitted assignments is the relative ease of various forms of cheating. Using both

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WriteWords's phrase frequency counter and Grammarly's plagiarism detection tools, instances of cheating can be reduced.

Regarding Grammarly's category for sentence structure, it seems that most errors here were direct translation errors. Often mistakes appeared as sentences created in object-subject-verb order or subject-object-verb order—in other words, according to Japanese sentence structures.

### **Teaching Implications**

There are a variety of ways to improve student writing making use of these tools. Beginning with word frequency and spelling, teachers can gain a better understanding of their students' lexical abilities. At the sentential level, preposition and article use as well as punctuation and capitalization errors can be addressed. Moreover, with concentrated practice on these problem areas, the data gathered by using computer-based correction software can certainly assist across a broad spectrum of learner errors.

Word choice, word frequency, and spelling are perhaps the easiest errors to monitor and target using these applications. These errors are quantifiable and are easily discovered by any grammar checking program. By gathering the class list of most frequently repeated words, the teacher can design lesson plans or homework focusing on finding synonyms for vocabulary expansion. It may be of use to remind students to double check their spelling before submitting the form. Lessons and quizzes centered on the class's most frequently misspelled words may address these errors.

Apart from regular study to build vocabulary, Tozcu, A. & Coady, J. (2004) and Bailey and Davey (2011) report positive findings regarding the use



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of computer assisted language learning programs to enhance vocabulary acquisition and retention. These studies focused their vocabulary corpus on high-incidence English words and content-based curriculum. Peter Groot, P), created the CAVOCA program in order to tackle the major problems of studying L2 vocabulary, mainly "...selecting the relevant vocabulary (which and how many words) and creating optimal conditions for the acquisition process." Generating a corpus and using (computer based software to study) problematic phrases, misspelled words, and common synonyms of frequently used words could have a beneficial impact on student vocabulary retention.

### **Conclusion**

These applications' abilities to process large amounts of data gathered from students can help educators notice writing patterns which otherwise may have been too time-consuming to observe. Gearing classes toward an internet-based assignment system has clear advantages; it organizes homework efficiently, it is easy to view and manipulate data, and, most importantly, it is easy for teachers and students to use. I advise that teachers not rely on these programs as flawless grammar checkers; however, they can act as valuable tools in a teacher's arsenal. They can help illuminate problematic areas that tend to be missed in the typical routine of grading a large number of submissions per week.

Using these reports in conjunction with individual meetings with students to discuss their work has helped to improve the standard of writing and raise awareness regarding the students' most common mistakes in class. In the second semester of course work, each student has received an

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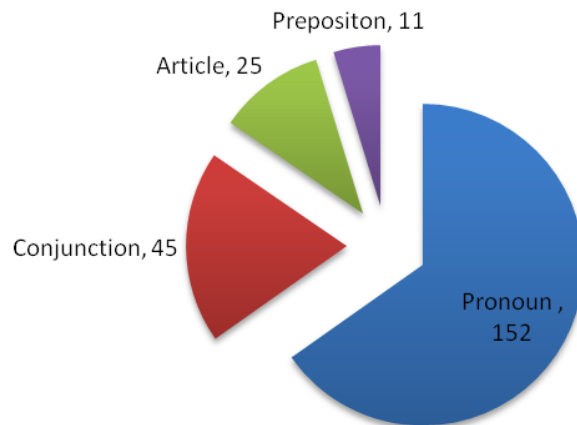
individually tailored report focusing on areas of their first semester writing that had been analyzed using these error correction applications. In upcoming semesters, I plan to do more extensive research to see what sort of discernible impact this focused error correction will have and other ways in which to implement this data in the classroom.

### References

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**Appendix A: Data from Online Services**

**Most Common Parts of Speech Used to Start Sentences**



**Top Five Mistakes According to Grammarly**



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### **Appendix B: Information Gathered**

Average Book Summary Length Per Student: 47 words

Top 5 Mistakes According to Grammarly.com

- 1) 178 Punctuation Mistakes
- 2) 79 Spelling Errors
- 3) 55 Issues with Sentence Structure\*
- 4) 45 Errors using the Passive Voice
- 5) 45 Errors using Articles

Most Commonly Used Verb: Be (107 is) (92 was) (33 were)232, Go/Going/Gone/Went-63, Have, had, having(33),

Most Commonly Used Noun: Story (33) one(31) (28 day)

Most Commonly Used Pronoun: He 111 She 76 71 His

Most Commonly Used Adjective: Old 20, Big 17, Strange 13

Most Commonly Preposition (to) 138, 92 (in), 51 (of)

Most Commonly Adverb Very 23, About 17, Finally 9,

Sentence beginnings:

pronoun (152) interrogative pronoun (5) article (25)

subordinating conjunction (7) conjunction (45) preposition (11)

The word usage counts are intended to help identify excessive use of particular parts of speech.

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## Appendix C - Book Report Form

**Name (First Name and Last Name) \***

**Today's Date**

For example (4/24/13)

**What section are you in? \***

Economics, Law or Business Hospitality

- Economics
- Law
- Business Hospitality

**Book Title \***

**What Level was your book? \***

- Pink
- Red
- Yellow

**Author \***

**How many pages does this book have? \***

**How many pages did you read? \***

**How long did it take to read this book? \***

For example: 2 hours

**Please summarize this book in 3 or 4 sentences \***

What is it about? What happens?

**Respond to the book in your own way. Please write 3 or 4 sentences. \***

Did you like the book? Why? What did it make you think about?

**Please write three new words you learned**

Write the English word, the Japanese meaning and the English meaning