Efficiency of Online Grammar Checker in English Writing Performance and Students' Perceptions

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Yang, Hyejin. 2018. Efficiency of online grammar checker in English writing performance and students' perceptions. *Korean Journal of English Language and Linguistics,* 18-3, 328-348. This study investigated efficiency of feedback from an online grammar checker, SpellCheckPlus, by examining (1) efficiency of feedback from the grammar checker in improvement of grammar accuracy in L2 students' writing and (2) students' perceptions towards the grammar checker as a language learning tool. A mixed-methods approach was employed to collect data by using multiple instruments, such as linguistic analysis of three major assignments and students' responses to the pre- and post-treatment questionnaires. The findings determined grammatical error rates significantly decreased between the first and second drafts for Assignments 2 and 3. No significant differences in error rates were noted between the first and second drafts for Assignment 1. Students' perceptions towards feedback from the grammar checker found incorrect writing feedback and students' lack of proficiency influenced error correction. Questionnaire responses determined students displayed relatively positive attitudes toward the grammar checker, while incorrect feedback hindered the level of the trustworthiness toward this feedback. This study implied the grammar checker could serve as a useful pedagogical tool to help grammar uses for low-proficient L2 learners' writing.

Keywords: feedback, grammar checker, writing classes, grammar accuracy

1. Introduction

Advanced writing skill is the critical qualification required for college students to show their intelligibility and comprehension of current issues pertinent to their majors in a more sophisticated way, constantly underscored in higher education. Vygotsky (1962) defined writing as a medium reflecting the development of one's language and critical thinking processes. However, despite constant emphasis on improving writing skills in academia, students' inadequate writing ability has been recognized as a serious problem. Hinkel (2004) asserted writing skills of nonnative speakers of English are still unacceptable to meet the criteria of higher education contexts. One of the main factors associated with students' poor writing skills may be their inaccurate grammar

use or lack of linguistic knowledge relevant to academic writing. Therefore, a majority of universities provide students with a variety of English writing classes equipped with grammar instruction to improve their writing skills in preparation of their future job market or academic achievement. With concerns about the importance of writing quality required in higher education, a growing number of studies have been conducted to explore how technology is employed to promote learners' language learning—particularly in L2 writing. Although Microsoft Word (MS Word) enables users to identify and correct spelling and minor grammar errors, its functions are confined to underline the problematic parts with some possible replacements, which lack educational comments. Distinguished from MS Word, recently other commercially available grammar checkers provide users with more informative feedback on these errors, such as SpellcheckPlus, Gingersoftware, Grammarly, and so forth.

However, use of grammar and spelling checkers in writing classes was not positively conceived in the early 1990s because grammar checkers during this period were confined to detect spelling or language errors rather than to offer constructive comments on contents and organization in essays. Hawisher, LeBlanc, Moran, and Selfe (1996) asserted "using grammar checkers resists meaningful change by using computers to reinforce older and often conventional ways of thinking about learning" (p. 205). Furthermore, the technical limitations of grammar checkers, such as inaccurate feedback and an imperfect error detecting function, resulted in pessimistic perceptions from users toward the software programs in language classrooms (Vernon 2000). Yet, continuous development and usage of grammar checkers in practice calls for a need to examine effectiveness of grammar checkers on students' writing performance. Thus, this study investigated (1) the efficiency of an online grammar checker, SpellCheckPlus, in improvement of grammatical accuracy in L2 writing and (2) students' perceptions towards it. Two research questions were addressed as follows:

1) The extent to which does feedback from a grammar checker contribute to the enhancement of grammar accuracy in students' writing assignments?
2) What are students' perceptions towards feedback from the grammar checker?

2. Literature Review

2.1 Significance of Grammar Accuracy in L2 Writing and Feedback

Although the pedagogical approach in Second Language Acquisition (SLA) shifted from the traditional grammar-centered approach to the communicative approach in the 1970s (Hegelheimer and Fisher, 2006), grammatical accuracy in L2 learners' writing is still seen as a crucial indicator of students' language proficiency and their intelligibility in academic settings (Hartshorn, Evans, Merrill, Sudweeks, Strong-Krause and Anderson 2010, Hinkel 2004, Silva 1993). Especially, the increasing needs for English writing ability required students to complete academic writing tasks on different genres, such as technical reports, article summarization, or course project papers in English as a Foreign Language (EFL) context (Woo 2015).

However, previous research revealed the lack of grammar accuracy in EFL students' English writing and the necessity of appropriate revision of grammar errors. (Ellis 1994, Ferris 2003, Lee 2005, Hyland and Hyland 2006). Especially in the Korean context, Lee (2005) argued against the views that neglected the necessity of grammar instruction in English education. He emphasized communicative language instruction should be well-balanced with grammar instruction considering students' lack of competence in grammar accuracy and writing skills. In an attempt to promote improvement in grammar accuracy in English writing, previous studies presented positive aspects of grammar-focused feedback in writing classes. Ferris (2004) claimed grammar error correction assists adult learners to become aware of their errors and to prevent fossilization of mistakes, which subsequently leads to enhancement of their linguistic competence. Ferris and Roberts' (2001) study showed the students' group, who received error feedback, outperformed and showed better self-correction skills in writing classes than those of the control group, who received no error feedback. Chapelle (2001) asserted feedback on grammar errors draws students' attention to grammar errors in their English usage. Given this, feedback has been considered as effective medium to foster language accuracy in writing.

2.2 Role of Grammar Checkers on Grammar Accuracy

With the advancement of technology, English learners have easy access to free, online grammar checker programs, such as SpellcheckPlus, Grammarly, Ginger

Software, etc. A recent tool, called Turnitin, allows students to check not only automated generated feedback from the system, but also instructors' embedded feedback on their writing. The aforementioned grammar checkers are devised to detect linguistics errors in students' essays and provide automated and prompt feedback to users. Especially, one of the practical merits of the automated, prompt feedback is it reduces teachers' burdens on grading, which subsequently contributing to consistency in students' grades (Chen and Cheng 2006, Kim 2014). Cotos (2011) found the strength of automated feedback from "its individualization, time, and cost effectiveness" (p. 421). She surmised automated feedback could encourage students to improve writing quality as they draw more attention to grammar errors in their writings.

Despite continuous development of English grammar checker, few studies have investigated the efficiency of grammar checkers. Furthermore, existing studies showed controversial results for the influence of a grammar checker on errors in students' writings. In earlier studies on grammar checkers, Fischer and Grusin (1993) found no significant differences in terms of grammar accuracy in students' texts between the control group, which did not use a grammar checker, and the experimental group, which used a grammar checker. A study by Issacs and Zhang (2009) examined the influence of grammar checker usage on the quality of EFL students' revisions. Students revised two different texts with and without the target grammar checker. Results showed error frequencies in the revised texts did not significantly decrease, even when the grammar checker was available for revision. In contrast to these studies, Domeij, Knutsson, and Eklundh (2002) explored how users interacted with a Swedish grammar checking tool, Granska, when they revised a given text containing 37 grammar errors. Results showed students revised 85% of the errors with a grammar checker, compared to 60% of the error corrections without the tool. The result supported potential effect of the checker to improve accuracy. To summarize, the existing studies determined a grammar checker improved grammatical accuracy in students' writings. This is worth further investigation to explore its potential because less research has been conducted with regard to current grammar checkers. Especially, little discussion was made to link the potential use of grammar checkers to quality of writing accuracy taught in English education in Korean contexts.

3. Method

3.1. Participants

  Sixteen participants (15 Chinese and 1 Korean) were undergraduate students majoring in diverse academic disciplines, such as business, engineering, finance, etc. They had learned English as a foreign language (EFL) for eight years on average in their respective countries. They were required to take an ESL writing class from a mid-western university in the USA as a result of an institutional English placement test (EPT). The EPT results indicated these students had problems with using appropriate English grammar in their writing performance. Thus, the students were required to take a fifty-minute writing class which aimed to help them enhance grammar accuracy in English writing. For one semester (16 weeks), students were required to complete three major writing assignments on three different genres in terms of exploratory, descriptive, and response essays. The details for the writing assignments are presented in the following section (Table 1).

3.2 Instruments

3.2.1 Online grammar checker

  The online grammar checker, SpellCheckPlus, was chosen for this study because it does not charge any fee for access and operates with most types of web-browsers, such as Internet Explorer, Safari, Chrome, and Firefox. To check grammar and spelling errors, students simply entered texts into the checker, which detects errors and provides prompt feedback. As shown in Figure 1, spelling errors are underlined in red color and grammar errors are highlighted in yellow color.
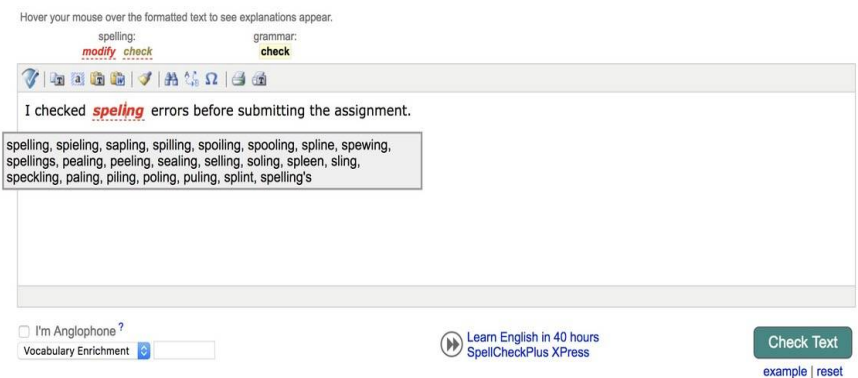
[Spelling errors]
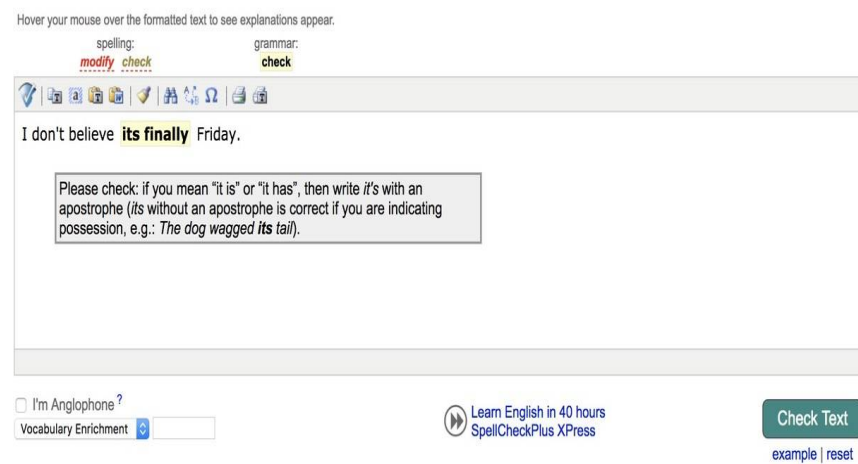
[Grammar errors]

Figure 1. Example of Errors Detected by SpellCheckPlus.

When students hovered a computer mouse over the detected errors, detailed feedback on the target errors was provided in the pop-up windows. In this study, students used the grammar checker to check and edit grammar and spelling errors in their writing assignments during the revision process.

3.2.2 Prompts for writing assignments

Students were required to complete three writing assignments over the semester. The genres for each assignment were not identical, namely expository writing for

Assignment 1, process writing for Assignment 2, and response writing for Assignment 3. Table 1 displays specific topics and prompts for each assignment. Students composed all drafts for the writing assignments using Microsoft word software (MS Word), and submitted all drafts to the online classroom management system, called Moodle.

Table 1. Guidelines for the Three Major Assignments

	Assignment 1	Assignment 2	Assignment 3
Topic (Genre)	Changing Attitudes (Expository)	New Product / Invention (Process writing)	Why study abroad? (Response essay)
Detail	As we mature, our attitudes (beliefs, values, personal characteristics, etc.) often change and we learn to view things differently. Think about an important change in your attitude toward a person, a group of people, or a set of ideas, values or traditions. Write an essay in which you contrast your earlier attitudes with the attitudes you now hold. Explain why change has occurred.	If you could invent something new, what product would you develop? Please specify a step-wise procedure to use the product.	Many students choose to attend schools or universities outside their home countries. Why do some students study abroad? Use specific reasons and details to explain your answer.

3.2.3 Pre- /post-treatment questionnaires

The pre-treatment questionnaire, consisting of 11 questions, aimed to explore students' background information (Questions 1-4) and previous experiences in grammar checkers (Questions 5-11) before participating in this study. Especially, the level of students' trustworthiness for a grammar checker was asked based on a five-point Likert-type question (Q10). Appendix A provides details for the pre-treatment questionnaire.

The post-treatment questionnaire, consisting of 12 questions, aimed to examine students' experiences and perceptions after using the online grammar checker. Students' perceptions towards the target grammar checker were measured on four five-point Likert-type statements (Q1-3, and Q8) in terms of ease, helpfulness of the grammar checker, and students' trustworthiness towards feedback of the checker. Students' opinions about helpfulness of the grammar checker (Q4) and its influence on their grammar use (Q5) were also examined. In open-ended questions (Q6-12),

students shared their opinions about the grammar checker in open-ended questions. Appendix B provides details of the questionnaire.

3.3 Data Collection Procedures

Data were collected in the following order. During the third week of the semester, students participated in a training session that aimed to learn how to access and use the different features of the target grammar checker. After an introduction to the grammar checker, students practiced finding and editing grammar errors with the sample texts provided by the teacher-researcher. At the end of the training session, students completed the pre-treatment questionnaire administered via an online classroom management system. Over the semester, students completed three major assignments and submitted the drafts for each assignment. During data collection, students revised the first drafts of each assignment using the grammar checker in the computer lab. They were not allowed to use other resources, such as online dictionaries or other websites in an attempt to prevent construct-irrelevant variables. Students revised the first drafts only using the grammar checker in a computer lab during the regular class session. All drafts were submitted to the class management system, called Moodle. At the end of the semester, the post-treatment questionnaire was administered via the classroom management system in the computer lab.

3.4 Data Analysis

Data included (1) the first and second drafts of three major assignments and (2) 16 students' responses to the pre- and post-treatment questionnaires. The types of grammar errors in the first and second drafts were identified and coded, based on sixteen error types adapted from Ferris (2004), and Vann, Meyer, and Lorenz (1984). In Table 2, the error types contained spelling, article, subject and verb agreement, noun agreement, tense, verb form, sentence fragment, punctuation, run-on sentences, word choice, preposition, relative clause, word order, conjunction, word form, and general expression. Examples and legends for each error type is displayed in Table 2.

The inter-coder reliability was calculated based on Cohen's Kappa (Cohen 1960). Substantial agreements were observed, $k = .78$ ($p = .000$). After coding the error types, frequencies of the errors were counted for drafts of each assignment, and converted to error rates per 100 words to make them comparable. A paired samples

t-test was conducted to examine any differences in grammar error rates per 100 words between first and second drafts of the three assignments, using SPSS22.

Table 2. The Types of Errors

Types of Errors	Legend	Example
Spelling	sp	Spelling errors
Article	arti	Absence of article: e.g., I bought car yesterday. Incorrect use of article: e.g., I bought an car yesterday.
Subject-Verb agreement	agsv	e.g., Everyone like to watch movie. (likes)
Noun agreement	agdn	Use of singular or plural nouns appropriately.
Tense	tense	Incorrect use of tense. e.g., When I visited Europe, I do not have enough money. (did not have)
Verb form	vf	e.g., I want have some coffee. (to have) e.g., I have wrote a letter to my friend. (written)
Sentence Fragment	sf	Arrange short chunk of sentences without using appropriate conjunctions. e.g., I went to school. I had lunch with my friends. Then, I worked out in the gym.
Punctuation	punc	Absence of punctuation; Incorrect use of punctuation. e.g., After writing the first draft I brought it to TAs to get some advice. : After writing the first draft, I brought it to TAs to get some advice.
Run-on sentences	run-on	Arrange several sentences without pausing.
Word choice	wc	Wrong word choice, which is not appropriate for the context.
prepositions	prep	Absence of preposition or incorrect use of preposition e.g., I am interested for math. (in)
Relative clause	rc	e.g., I enjoyed reading the book whom my father bought to me. (which)
Word order	wo	e.g., I don't know what should I do. I don't know what I should do.
Word form	wf	Incorrect use of word form Or using 'a verb' instead of using 'a noun' e.g., I want to success in the future. (X); succeed
Expression	exp	Expressions that do not make sense e.g., Even the farthest distance, our hearts are no longer afraid; and then a long way again, it is not hard to go out.
conjunction	conjuc	Wrong conjunction

4. Results and Discussion

4.1. Efficiency of Feedback from the Grammar Checker

The first research question investigated the extent to which the grammar checker led significant chances in error frequencies in students' writing. The normalized error rates per 100 words were obtained for the first and second drafts of each assignment. Table 3 shows the means of the normalized error rates per 100 words for the first and second drafts of the three assignments.

Table 3. Means of the Normalized Error Frequencies for the Three Assignments

Assignments (n=16)	First draft		Second draft	
	M	SD	M	SD
Assignment 1	7.00	2.97	7.36	2.10
Assignment 2	6.21	2.88	4.60	1.55
Assignment 3	6.75	2.94	4.17	1.77

Results of the paired samples t-test showed significant changes between the first and second drafts for Assignments 2 and 3. No changes were shown for assignment 1. To recapitulate, there was a significant difference in the first (M=6.21, SD=2.88) and second drafts (M=4.60, SD=1.55) for Assignment 2; t(15)= 2.94, p= .01∗ (p<.05). The same results were found for Assignment 3 as follows. The first (M=6.75, SD=2.94) and second drafts (M=4.17, SD=1.77) for Assignment 2; t(15)= 4.62, p= .00∗ (p<.05). However, no significant difference in error rates was determined between the first (M=7.00, SD=2.97) and second drafts (M=7.36, SD=2.10) for Assignment 1; t(15)= −.57, p= .57 (p<.05). In conclusion, the results indicate the grammar checker contributed to a significant decrease in error rates between the drafts for Assignment 2 and Assignment 3, but not for Assignment 1.

Although the error rates were reduced for Assignments 2 and 3, this could be a result of other possible factors, such as learning effects from class instruction and differences in assignment genres, to yield this result. Therefore, further studies may be worthwhile to discover potential factors, such as class instruction or different essays genres to confirm the effectiveness of the grammar checker on reduction of error rates. In brief, results showed potentials for grammar checkers to improve grammar accuracy in spite of this ambiguity.

4.2. Students' Perceptions towards Feedback from the Grammar Checker

The second research question examined students' perceptions towards feedback from the grammar checker, focusing on its helpfulness and students' trustworthiness towards feedback from the grammar checker.

4.2.1 Helpfulness of feedback from the grammar checker

Fourteen students expressed positive response to the helpfulness of the grammar checker in the post-treatment questionnaire. Students' opinions about helpfulness were also measured on two five-point Likert-type statements. Students' perceptions on the grammar checker leans towards positive sides as shown in Table 4.

Table 4. Students' Perceptions towards Helpfulness of Grammar Checker

Questions (n=16)	Mean (SD)
Q2. After using the grammar checker, do you think it is helpful for you to revise the errors in your essay?	3.75 (.66)
Q8. To what extent did the experience in using the grammar checker affect your attitudes towards checking grammar errors in your essays?	3.87 (.69)

*1 refers to negative; 5 refers to positive views.

In addition, the following excerpts from the post-treatment questionnaire showed students' positive perceptions towards the helpfulness of the checker. They stated the grammar checker helped them find their weaknesses in English grammar use.

I think it's very helpful because I can check my grammar mistakes and I also can correct it because of grammar checker. [Student 1]

When I finish the paper, the grammar checker knows this kind of mistakes I usually make… I know which one is my weakness. [Student 1]

It figures out the errors and it has the explanations, so I can know why I was wrong. [Student 2]

The grammar checker improved my verb form and tense. [Student 3]

Learn more English grammars, make my essay more accurate. [Student 7]

On the other hand, students indicated pessimistic views on the helpfulness of the grammar checker. For example, Student 5 expressed improvement of writing was attributed to continuous practice to write during the class, rather than using the grammar checker. Students reported the limitations of the grammar checker since it could not detect all error types as shown in the following excerpts.

No, I don't think so. As I become to write lots of paper for classes, my writing skills naturally improved. [Student 5]

Sometimes it couldn't fix the problem like whole sentence order. [Student 14]

It cannot find all mistakes. [Student 11]

Grammar checker helps me check SOME mistakes. [Student 13]

In the post-questionnaire, students were asked to indicate which types of grammar aspects the grammar checker helped them detect. Results in Table 5 showed the grammar checker was the most helpful to find errors on verb tense (10 students), followed by verb form (8 students), subject-verb agreement and word form (7 students), word choice (4 students), word order (3 students), and punctuations (2 students).

Table 5. Types of Grammar Aspects Assisted by the Grammar Checker

Grammar aspects	Frequencies
Tense	10
Verb form (e.g., to-intinitives or gerunds, etc.)	8
Subject-verb agreement	7
Word form (e.g., nouns, adjectives, and adverbs, etc.)	7
Word choice	4
Word order	3
Punctuation (e.g., comma, period, etc.)	2

Overall, results provided evidence to support the helpfulness of feedback from the grammar checker on students' writing assignments.

4.2.2 Students' trustworthiness towards the grammar checker feedback

The level of students' trustworthiness was measured with a five-point Likert-type statement for the pre-treatment questionnaire (Q10) and post-treatment questionnaire (Q3). As shown in Table 6, students' responses to their trustworthiness on the grammar checker slightly lean towards the positive side before using it in the pre-questionnaire. However, the level of trustworthiness among the students decreased from 'Slightly' to 'Neutral' in the post-treatment questionnaire. Paired-samples t-test indicated no significant differences in students' trustworthiness between the pre- and the post-questionnaires; t(15), p=.65.

Table 6. Students' Level of Trustworthiness towards the Grammar Checker

Question: Please indicate your level of trustworthiness on language (grammar) checking tools.	Mean (SD)
Pre-treatment questionnaire (n=16)	3.43 (.89)
Post-treatment questionnaire (n=16)	3.31 (.79)

*1 refers to low level of trustworthiness; 5 refers to high level of trustworthiness

Students' responses to the open-ended questions in the questionnaires supported a moderate level of trustworthiness. The reason for the decrease in the level of trustworthiness might be attributed to false feedback. Eight students in the post-questionnaire pinpointed the incorrect feedback and the limited capability of detecting all errors as weaknesses of the tool in the post-questionnaire.

The detected error is not sometimes correct. [Student 1]

The grammar checker cannot check all the errors in my essay. Sometimes, it is not an error, but the checker consider it as an error. [Student 6]

It often finds wrong error that makes me confused. [Student 8]

Table 7 describes an example of inaccurate feedback in Student 2's essay. In the first draft, Student 2 wrote "To enter good universities, I had to ...." In this sentence, the grammar checker recognized a word 'enter' as a verb; thus, it suggested replacing 'good' with 'well', an adverb.

Table 7. Example of Inaccurate Feedback from the Grammar Checker

The first draft	Feedback from the grammar checker
To <u>enter</u> good universities, I had to...	You should probably use the adverbial form 'well'; e.g., she works well.

Despite the limitation of the grammar checker, 13 students expressed they were willing to continue usage of the grammar checker even after the course was completed, when asked a question regarding their willingness to use the grammar checker in the post-questionnaire (Q9: Will you continuously use other grammar/spelling checkers to revise your essay?). In response to the question asking for their overall opinions (Q11: Please write short opinions about using grammar checker based on your experiences), eight students revealed positive impressions for the grammar checker. For example, Student 10 mentioned, "before using grammar checker, thought it is just a software like Microsoft Words, however when I use it, I find it is more useful than my expect. It can tell a lot of mistakes that Microsoft Words cannot tell, although it does not work sometimes, overall it is quite a good software."

In a nutshell, although the grammar checker sometimes either provided wrong feedback or failed to detect all errors, the students agreed the grammar checker was beneficial to assist them to notice their errors, as well as offer suggestions to correct the error. In addition, the false feedback seemed to mainly affect the reduction of the level of trustworthiness toward the feedback, which addressed the necessity to improve the quality of the grammar checker, especially to detect errors more precisely. Previous studies also noticed incorrect grammar feedback and lack of students' willingness to read the provided comments may also prevent the effective use of the feedback (Kepner 1991, Polio, Fleck and Leder 1998, Robb, Ross and Shortreed 1986, Semke 1984, Sheppard 1992). This finding call for technical improvement in the future grammar checkers.

5. Conclusion and Implications

This research explored the efficiency of the grammar checker in students' enhancement of grammar accuracy in English writing and their perceptions. The results for the first research question presented relatively positive influence of the grammar

checker feedback on enhancement in grammar accuracy of L2 writing. Significant differences in error rates were observed between the first and second drafts of Assignments 2 and 3, but not those for Assignment 1. The students' perceptions toward the grammar checker were analyzed in terms of helpfulness and students' trustworthiness for the checker. The majority of students revealed their positive opinions about the helpfulness of the grammar checker to enhance grammar accuracy. The grammar checker appeared to check errors on verb tense, verb form, and subject-verb agreement the most frequently. Students showed a moderate level of trustworthiness for the grammar checker. Students' responses to the questionnaires pointed out inaccurate feedback and limited scope of error detection for the grammar checker, which resulted in a moderate level of their trustworthiness.

The present study included some limitations to improve in future research. First, the participants' limited language proficiency could influence the results of the current study. If advanced learners participated in the study, the results could differ in terms of error rates, their attitudes, and responses to the grammar checker. Another limitation is that the present study did not include any control group which could compare with the treatment group using the grammar checker. Although the error rates in Assignment 2 and 3 decreased consistently, there could be potential influence of practice effect on the findings of this study. Therefore, it calls for a need to conduct a comparative study between the control and the treatment group in order to further explore to what extent the grammar checker could enhance linguistic accuracy in students' writing assignments. Furthermore, the study relied on a sole grammar checker. Depending on different types of existing commercial grammar checkers, results in error detection rates and students' responses could vary. Comparative study of different types of grammar checkers could be the potential topics for future research. At last, the results indicated changes in overall error rates across the three assignments over the semester, which did not suggest influence of the grammar checker on certain error types such as subject-verb agreements, verb tense, and word forms, and so forth. To further support potential usefulness of the grammar checker, therefore, the future study needs to examine the extent to which the grammar checker could detect specific types of grammar and spelling errors.

The findings from this study presented a potential for grammar checker usage as a supplementary tool in L2 writing classes. For pedagogical implications, teachers should recognize weaknesses of the grammar checker and provide appropriate guidance to students. Especially, students with low-proficiency can be fooled by incorrect feedback

from the grammar checker. Several scholars have asserted effective pedagogical practices should be taken into consideration to hinder possible negative effects of technology on students' language learning rather than merely focusing on the effectiveness of technology itself (Beatty 2003, Chapelle 2003, Levy and Stockwell 2006, Warshauer and Ware 2006). As for teachers' instruction, Chapelle and Jamieson (2008) highlighted the significance of teachers' consistent support for students to assist them in appropriate use technology for language learning. In the EFL context, where students relatively lack grammar accuracy, teachers need to provide extra instruction or in-class activities that guide students to respond appropriately to inaccurate feedback from grammar checkers. Another pedagogical suggestion is that teachers can encourage their students to use the grammar as a medium to preliminary check grammar accuracy in their early writing drafts. Initial check of grammar accuracy could draw students' more attention to accurate grammar use during the writing process. Finally, findings and interpretations can be meaningful information to developers of grammar checkers to enhance technical capability of error detection and accuracy of feedback.

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Examples in: English
Applicable Languages: English
Applicable Level: Tertiary

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Appendix A. Pre-treatment Questionnaire

1. Which country are you from?

2. What is your mother tongue (Native Language)?

3. What is your major?

4. How long have you been in USA?

   Less than 1 year   1 year - 2 years   2 year - 3 years

   3 year - 4 years   More than 4 years

5. Have you ever used language checking tools like grammar checker (e.g., Microsoft word checker, Other word processing software, Spellchecker, AbiWord, Language Tool, Grammar Slammer, etc.)?

   Yes   No

6. If you said 'yes', what grammar checkers have you used before? Please specify the types of the checker that you have used.

7. If you have, how often do you use them when you write / revise essays?

   Every time when I write an essay   Once a week

   2 - 4 times per week   Once a month

   2 -3 times a month   4 times a month

   Seldom use   Never

   No answer

8. If you have 'never' used grammar checker, what makes you not to use the checkers? Please express your thought briefly.

   I prefer to revise it by myself

   I prefer to check the grammar errors with people's (e.g. teachers, colleagues) help rather than using computer-based grammar checkers

   I just do not have many chances to use the checkers

   I do not quite believe the computer-based grammar checker due to its limitation of checking grammar

   Other reasons

9. When do you usually use language-checking tools?

Writing essays   Emails   Instant Messages

Others   Nothing

10. Please indicate your level of trustworthiness on language (grammar) checking tools.

    1   2   3   4   5

I don't trust   strongly trust

11. What do you think of grammar-checking tools? If you have never used it, what is your expectation toward grammar-checking tool?

Appendix B. Post-treatment Questionnaire

1. How easy is it to use the grammar checker?

1   2   3   4   5

strongly difficult   strongly easy

2. After using the grammar checker, do you think 'language checker' is helpful for you to revise the errors in your essay?

 1   2   3   4   5

not helpful   strongly helpful

3. After using the grammar checker, how much do you trust the language-checking tool regarding checking grammar errors?

   1   2   3   4   5

I don't trust   strongly trust

4. Overall, do you think using the grammar / spelling checker helps you improve grammar accuracy in your essays?

Yes   No

5. Which part of the grammar do you think you improve the most while using the grammar checker?

Tense

Subject-verb agreement

Punctuation (e.g., comma, period, etc.)

Word order

Word choice

Word form (e.g., noun, adjective, adverbs, etc.)

Verb form (e.g., to infinitives or gerunds)

6. Please briefly describe the merits (that you can benefit from) of the grammar checker.

7. Please briefly describe the weaknesses of the grammar checker.

8. To what extent did the experience in using the grammar checker affect your attitudes towards checking grammar errors in your essays?

    1   2   3   4   5
Did not affect   Did affect

9. Will you continuously use other grammar/spelling checkers to revise your essay?

Yes   No

10. Please write short opinions about using grammar checker based on your experiences.

11. Do you have any suggestions for the future use of the grammar checker in English writing classes?

12. Do you have any suggestions for further improvement on language-checking tools?