The QuillBot Grammar Checker: Friend or Foe of ESL Student Writers?

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ABSTRACT
The use of automated written corrective feedback applications in the writing classroom has been widely researched. However, as the QuillBot grammar checker was newly launched, no studies had been conducted on its accuracy and usability among English as a Second Language (ESL) student writers. To address this gap, a small-scale sentence- and paragraph-level test was carried out to determine whether it would be a useful tool for ESL students to obtain feedback in real-time instead of waiting for teacher corrective feedback. The new, freely available grammar checker was tested along with the free version of two other popular grammar checking tools, Grammarly and Ginger. Actual writing samples from second-year diploma students were used. The results indicate that the QuillBot grammar checker outperformed the other two software. However, this tool is not perfect and users will still have to manually check for undetected errors and decide if suggestions should be accepted or ignored. Therefore, it is recommended that QuillBot should be used to supplement and not replace teacher feedback. With students using the QuillBot grammar checker in their writing tasks, teachers do not only save time on checking language errors but also have more time to provide feedback regarding global writing concerns, namely, content and organization.

INTRODUCTION

Teaching English composition is not an easy task. Teaching composition to English as a Second Language (ESL) learners is even more challenging, so a wealth of research has focused on this area. To help students develop writing skills, providing feedback is an essential task of a writing instructor (Bitchener & Ferris, 2012; Ellis, 2009). Chickering and Gamson (1987) asserted that giving prompt feedback to students is one of seven cardinal principles that enhances student learning. This assertion is still generally agreed to by current educators (Lemley et al., 2007). Providing fast feedback is considered a very important part of the job of a teacher because the impact of grammar feedback on student writers has been found to be positive (Cavaleri & Dianati, 2016). Research has shown that students value immediate grammar feedback (Huang, 2011) and in fact, they expect immediate feedback especially in an online environment (Vrasidas & McIsaac, 1999). Therefore, although the author teaches 16 to 18 hours a week in a university branch campus in Malaysia, she strives to provide feedback on writing in a timely manner, usually a week after submission.

Content, organization and language accuracy are important aspects of writing (Hyland, 2001). It is the author's practice to give personalized, comprehensive feedback on these three concerns to facilitate writing improvement although it is time-consuming and requires intensive effort. Unfortunately, when dealing with large classes, it is not always possible to respond to each student's work in detail within a short time frame. Therefore, the author usually opts to give content-related responses for first drafts. Comments on language use are kept for later drafts. This writing pedagogy follows Zamel (1985) who suggested that using a process-writing approach makes writing development more manageable and effective.

Providing feedback on language accuracy is not only a time-consuming task but it is also energy-intensive. Instead of becoming a "proofreading slave" (Geiller, 2014) correcting every grammar or sentence-level error, the author would choose a few common language errors to be highlighted in class such as subject-verb disagreement, vague pronoun reference, tenses, run-ons, sentence fragments, comma splices, faulty parallelism, misplaced or dangling modifiers and commonly confused words followed by targeted practices to help her students work on their problematic areas. This kind of selective error feedback is effective particularly for grammatical errors which can be resolved by teaching the rules such as subject-verb agreement, tenses, and incomplete sentences (Bitchener & Knoch, 2009; Ferris, 2012).

As giving written feedback on sentence-level errors was not an easy task due to time constraints and class size, the author searched for more efficient ways to help her student writers improve their grammar accuracy in writing. The author came cross online grammar checkers or also known as automated written corrective feedback (AWCF) software. She had hoped that these online teacher's assistants would reduce her workload as well as make her students become better independent self-editors. However, the early versions were disappointing. Research found such proofreading software often failed to detect many errors, flagged correct writing, and suggested wrong corrections (Vernon, 2000) as well as provided complex explanations that were too difficult for ESL student writers to understand (Macarthur, 1999). As the early versions were unreliable, the author continued to spend much time and energy giving written feedback as

quickly as possible.

Fortunately, with the advent of artificial intelligence (AI), the current online grammar checking software are much improved. The integration of such tools in the writing classroom is supported by recent research. For example, Lim and Phua (2019) who investigated the use of a leading linguistic feedback tool in Singapore schools found that the tool was not only well received by both teachers and students, but it was also a time-saver for the teachers concerned. Zhang et al., in their 2020 study involving ESL students in American universities, highlighted that the participants preferred to use both an online grammar checking application and face-to-face tutoring. This finding corresponds with the result of a 2019 research by O'Neill and Russell that students in an Australian university preferred receiving feedback from both an online grammar checker and their academic learning advisors. Other studies have shown that these tools are as good or even better than teachers in detecting grammatical errors (Hutchinson 2007; Wang & Brown, 2007).

It should be noted, however, that for a software that has both a free and a premium version, the free option offers fewer features than the premium subscription. Some of the current popular tools include Grammarly, Ginger and ProWritingAid (Subham et al., 2020). Although these newer applications are much better at detecting grammar errors, some studies have concluded that these online grammar checkers still do fail to catch errors and provide faulty feedback and suggestions (Cavaleri & Dianati, 2016; Perelman, 2016)). Nevertheless, as existing studies indicate that these tools have a role in the writing classroom (Im, 2021; John & Woll, 2020; Nabi et al., 2021; Woodworth & Barkaoui, 2020; Zhang et al., 2020), the author continued searching for a freely available grammar checking application that is reliable. Reliability is an important factor that determines the extent of student engagement with the tool (Ranalli, 2021). In other words, students will only use a grammar checking tool which they trust will provide accurate and explicit feedback.

Recently, the author came across a new software, the QuillBot grammar checker released in March 2021 (QuillBot team, 2021). This free software is the third tool offered by QuillBot.com, a one-stop writing platform which started with its flagship paraphraser and summarizer. In August 2021, QuillBot launched another tool, its citation generator (Perry, 2021). As the QuillBot grammar checking tool is still new, there is scarce literature on its quality. Although it is able to provide prompt feedback, is it comprehensive and accurate at detecting and correcting spelling, grammar, and punctuation errors? How does it compare with current popular grammar checkers?

TESTING THE QUILLBOT GRAMMAR CHECKER

To evaluate the robustness of the QuillBot grammar checking software, the author decided to compare it with the free version of two popular online grammar checkers, Grammarly and Ginger (Subham et al., 2020). Authentic writing samples were used. The samples were ten original sentences and nine unedited paragraphs submitted online by the author's Malay students who were in their second year of study for a diploma. These sample sentences and paragraphs

contained common errors in terms of grammar such as subject-verb agreement, noun-pronoun agreement, articles, tenses and punctuation.

Sentence-level Test

For the sentence-level test, ten unedited sentences were carefully copied and pasted in the text box provided in all three grammar checkers. Each error which was identified by the tool was replaced with the suggested option.

The sample sentences and the corrections given by the three grammar checkers as well as the author's suggestions are as follows:

1. **Student stress** due to (**?**) **covid-19** pandemic because they have **many works** to do.	6 errors
Author's suggestions	*Students feel stressed* due to *the COVID*-19 pandemic because they have *a lot of work* to do.	
QuillBot	*Students are stressed* due to *the COVID*-19 pandemic because they have *a lot of work* to do.	All errors detected
Grammarly	**Student stress** due to (?) **covid**-19 pandemic because they have **many works** to do.	**All errors undetected**
Ginger	**Student stress** due to (**?**) **covid**-19 pandemic because they have **many works** to do.	**All errors undetected**

2. First **thing** first, eat a **health** and nutritious diet. **It's** can give the **student** energy to do their study.	5 errors
Author's suggestions	First *things* first, eat a *healthy* and nutritious diet. *It* can give the *students* energy to do their *studies*.	
QuillBot	First **thing** first, eat a *healthy* and nutritious diet. *It* can give the **student** energy to do their *studies*.	**2 errors undetected**
Grammarly	First **thing** first, *eats* a *healthy* and nutritious diet. **It's** can give the **student** energy to do their **study**.	**4 errors undetected;** 1 incorrect suggestion
Ginger	First **thing** first, eat a *healthy* and *nutrition* diet. **It's** can give the **student** energy to do their **study**.	**4 errors undetected;** 1 incorrect

		suggestion

3. We as **a student is** learning online, **we** can maintain **a** good mental health by **do** exercises at home.		5 errors
Author's suggestions	W*e, as students who are* learning online, can maintain good mental health by *doing* exercises at home.	
QuillBot	*As* *a student* learning online, we can maintain good mental health by *doing* exercises at home.	1 incorrect suggestion
Grammarly	We as **a student is** learning online**, we** can maintain good mental health by *doing* exercises at home.	**3 errors undetected**
Ginger	We as **a student is** learning online**, we** can maintain **a** good mental health by *doing* exercises at home.	**4 errors undetected**

4. **Get** enough sleep also **help** to reduce stress.		2 errors
Author's suggestions	*Getting* enough sleep also *helps* to reduce stress.	
QuillBot	*Getting* enough sleep also *helps* to reduce stress.	All errors detected
Grammarly	**Get** enough sleep also **help** to reduce stress.	**All errors undetected**
Ginger	**Get** enough sleep also **help** to reduce stress.	**All errors undetected**

5. **An** enough sleep, keeping our **body stay** fit and **(?)** a good diet **is** important to maintain good mental health.		5 errors
Author's suggestions	*Getting* enough sleep, keeping our *bodies* fit and *eating* a good diet *are* important to maintain good health.	
QuillBot	**(?)** Enough sleep, keeping our *bodies* fit and **(?)** a good diet *are* important to maintain good mental health.	**2 errors undetected**

Grammarly	**(?)** Enough sleep, keeping our **body stay** fit_, and **(?)** a good diet *are* important to *maintaining* good mental health.	**4 errors undetected;** 1 unnecessary suggestion
Ginger	**An** enough sleep, keeping our **body stay** fit and **(?)** a good diet **is** important to maintain good mental health.	**All errors undetected**

6. It **(?)** important to **doing the** regular exercises. [30 minutes of physical activity].		4 errors including fragment
Author's suggestions	It *is* important to *do* regular exercises. *Do* 30 minutes of physical activity *daily.*	
QuillBot	It *is* important to *do* regular exercises. [30 minutes of physical activity].	Fragment undetected
Grammarly	It *is* important to *do* regular exercises. [30 minutes of physical activity].	Fragment flagged but not corrected
Ginger	*It's* important to *do* **the** regular exercises. [30 minutes of physical activity].	1 **error** and fragment undetected

7. For example, [reading a book, listening to **song**, playing **a** football and other].		3 errors including fragment
Author's suggestions	For example, *read* a book, *listen* to songs, *play* football *or any other activities*.	
QuillBot	For example, [reading a book, listening to *songs*, playing football and *others*].	Fragment undetected
Grammarly	For example, [reading a book, listening to *a* song, playing football_, and *others*].	1 unnecessary suggestion; fragment undetected
Ginger	For example, [reading a book, listening to *a song*, playing **a**	2 **errors** and

	football and **other]**.	fragment undetected

	8. **Its** normal to **(?)** stressed and worry about our **study**.	3 errors
Author's suggestions	It is normal to *be* stressed and worry about our *studies*.	
QuillBot	*It is* normal to *feel* stressed and worry about our *studies.*	All errors detected
Grammarly	*It is* normal to *stress* and *worries* about our *studies.*	2 incorrect suggestions
Ginger	*It's* normal to *stress* and worry about our **study**.	1 **error** undetected; 1 incorrect suggestion

	9. I hope life **return** to normal as soon as possible. [So that **student** can reduce their stress].	3 errors including fragment
Author's suggestions	I hope life *returns* to normal as soon as possible *so* that *students* can reduce their stress.	
QuillBot	I hope life *returns* to normal as soon as possible. [So that students can reduce their stress.]	Fragment undetected
Grammarly	I hope life *to* return to normal as soon as possible**.** [So that **student** can reduce their stress.]	1 **error** and fragment undetected; 1 incorrect suggestion
Ginger	I hope life **return** to normal as soon as possible. So that **student** can reduce their stress.	**All errors undetected**

	10. This **covid-19 (?)** has **impact everyone** lives **(?)**	5 errors

Author's suggestions	This *COVID*-19 *pandemic* has *impacted everyone's* lives**.**	
QuillBot	This *COVID-19* **(?)** has *an* impact *on everyone's* lives**.**	**1 error undetected**
Grammarly	This **covid**-19 **(?)** has **impact everyone** lives **(?)**	**All errors undetected**
Ginger	This **covid**-19 **(?)** has *impacted* **everyone** lives **(?)**	**4 errors undetected**

As an experienced English language lecturer with more than 30 years of experience teaching diploma and degree students, the author carefully noted a total of 41 errors and as expected, none of the three free automated grammar analysis tools were able to detect all the errors. Only QuillBot managed to detect all errors in three sentences, specifically, sentences 1, 4 and 8. Table 1 summarises the performance of the three online grammar checking software at sentence level.

Table 1
Performance of QuillBot, Grammarly and Ginger at Sentence Level

Online Grammar Checker	No. of undetected errors	No. of undetected fragments	No. of sentences with all errors detected	No. of sentences with all errors undetected	No. of incorrect suggestions	No. of unnecessary suggestions
QuillBot	5	3	3	0	1	0
Grammarly	12	2	0	3	4	2
Ginger	16	2	0	4	2	0

As indicated in Table 1, QuillBot was able to detect the highest number of errors while Ginger was the poorest performer with the greatest number of undetected errors (16). It consistently failed to detect obvious errors. The finding that Ginger is worse than Grammarly is in contrast with that of Daniels and Leslie (2015) who found Ginger to be the most accurate grammar checker compared to Grammarly and Microsoft Word.

The free version of Grammarly offered the highest number of fallible feedback (4). This finding aligns with the results of a recent research by Nova (2018) who found that Grammarly provided wrong feedback on the correctly identified errors. Furthermore, it is interesting to note

that in contrast to QuillBot and Ginger, Grammarly also gave the unnecessary recommendation regarding the use of the Oxford or serial comma.

Another interesting finding is that QuillBot and Ginger were unable to detect and therefore correct fragments (sentences 6, 7 and 9) which is unfortunately, a common error committed by ESL student writers (Zheng & Park, 2013). The free version of Grammarly failed to detect the fragments in sentences 7 and 9 but did flag sentence 6. However, it did not suggest a correction because this feature is only reserved for premium users. As for the finding that Ginger failed to identify incomplete sentences, it is in line with Subham et al. (2020) who found that the full (paid) version of Ginger did not flag even a single fragment and run-on error.

Overall, the results of the sentence-level test reveal that QuillBot is the best performing free AI grammar checker among the three with the least number of unflagged errors while Ginger fared the worst. The finding that QuillBot outperformed Grammarly raised the author's hope that she had finally found a free and useful grammar checking tool that could be suggested to her students. So far, the author has been hesitant to recommend Grammarly because research has shown that although it is currently the top-rated application, it was only 44 per cent accurate when 500 sentences with common errors were fed to this tool (Subham et al., 2020).

Paragraph-level Test
Nine original paragraphs which consisted of introductions, body paragraphs and conclusions were extracted from the author's diploma students' work. These paragraphs were tested using the same three online grammar checkers. All the nine paragraphs were carefully copied and pasted in the text box provided in the grammar checking tools. The following are the corrections suggested by these free AI-powered grammar checkers together with the author's own suggestions:

Introduction 1 In a period of just **few** months, **the** COVID-19 has profoundly changed the lives of masses of individuals around the world, including students. This **causes** all students around the world **are** affected **by** their studies. The **covid-19** pandemic has changed my life as a student such as changing **learning** style, learning environment and time management.		7 errors
Author's suggestions	In a period of just *a* few months, COVID-19 has profoundly changed the lives of masses of individuals around the world, including students. This *has caused* all students around the world *to be* affected *in* their studies. The *COVID*-19 pandemic has changed my life as a student such as changing *my* learning style, learning environment and time management.	
QuillBot	In a period of just *a* few months, COVID-19 has profoundly changed the lives of masses of individuals around the world, including students. All students around the world are affected **by** their studies. The *COVID*-19 pandemic has changed my life as a student, such as changing *my* learning style, learning	**1 error undetected;** 1 unnecessary suggestion

	environment**,** and time management.	
Grammarly	In a period of just *a few* months, **the** COVID-19 has profoundly changed the lives of masses of individuals around the world, including students. This **causes** all students around the world *to be* affected **by** their studies. The **covid**-19 pandemic has changed my life as a student such as changing *my* learning style, learning environment, and time management.	**4 errors undetected**
Ginger	In a period of just *a few months*, **the** COVID-19 has profoundly changed the lives of masses of individuals around the world, including students. This **causes** all students around the world **are** affected **by** their studies. The **covid**-19 pandemic has changed my life as a student such as changing **learning** style, learning environment and time management.	**6 errors undetected**

Introduction 2 This **pandemic** Covid-19 has changed the **lives** of almost every person. **After that**, this problem also directly **affecting** the education system and it gives many bad impacts to **their** studies. **This** Covid-19 has changed my **student's** life in many ways such as **learning** process, education cost and time management.		8 errors
Author's suggestions	This Covid-19 *pandemic* has changed the *life* of almost every person. This problem also directly *affects* the education system and it gives many bad impacts to *students'* studies. Covid-19 has changed my *student* life in many ways such as *my* learning process, education cost and time management.	
QuillBot	This **pandemic** Covid-19 has changed the **lives** of almost every person. **After that,** this problem also directly *affects* the education system and *has* many bad impacts *on students'* studies. **This** Covid-19 has changed my **students' lives** in many ways*,* such as**the** learning process, education cost*,* and time management.	**4 errors undetected;** 2 incorrect suggestions
Grammarly	This **pandemic** Covid-19 has changed the **lives** of almost every person. **After that**, this problem also directly **affecting** the education system and it gives many bad impacts **on** **their** studies. **This** Covid-19 has changed my **student's** life in many ways, such as **the** learning process, education cost, and time management.	**7 errors undetected;** 2 incorrect suggestions

Ginger	This **pandemic** Covid-19 has changed the **lives** of almost every person. **After that**, this problem also directly **affecting** the education system and it gives many bad impacts to **their** studies. **This** Covid-19 has changed my **student's** life in many ways, such as *a* learning process, education cost and time management.	**7 errors undetected;** 1 incorrect suggestion

Introduction 3 Covid-19 is a big problem that our country needs to **fighting** right now. This has been **troublesome the** students nowadays. They need to change their **study** lifestyle **from** many **sides** such as time management, finance and leisure time.		6 errors
Author's suggestions	Covid-19 is a big problem that our country needs to *fight* right now. This has been troublesome *for* students nowadays. They need to change their *student* lifestyle *in* many *ways* such as time management, finance and leisure time.	
QuillBot	Covid-19 is a big problem that our country needs to *fight* right now. This has been troublesome *for* students nowadays. They need to change their **study** lifestyle **from** many **sides**, such as time management, finance, and leisure time.	**3 errors undetected**
Grammarly	Covid-19 is a big problem that our country needs to **fighting** right now. This has been troublesome *for* **the** students nowadays. They need to change their **study** lifestyle **from** many **sides** such as time management, finance, and leisure time.	**5 errors undetected**
Ginger	Covid-19 is a big problem that our country needs to *be fighting* right now. This has been **troublesome the** students nowadays. They need to change their **study** lifestyle **from** many **sides** such as time management, finance and leisure time.	**5 errors undetected**

Body Paragraph 1 Firstly, **covid 19** has changed the lives of **student** in terms of financial cost. Many students feel burdened when they have to spend money to buy internet data to enable them to attend online classes, online exams and submit **assignment**. In **additional**, to enable students to attend online classes, **it required** a fast internet connection. Students have to spend a lot of money to enable them to take online classes more effectively.		6 errors
Author's suggestions	Firstly, *Covid-19* has changed the lives of *students* in terms of financial cost. Many students feel burdened when they have to	

	spend money to buy internet data to enable them to attend online classes, online exams and submit *assignments*. In *addition,* to enable students to attend online classes, a fast internet connection *is required*. Students have to spend a lot of money to enable them to take online classes more effectively.	
QuillBot	Firstly, *COVID 19* has changed the lives of *students* in terms of financial cost. Many students feel burdened when they have to spend money *on buying* internet data to enable them to attend online classes, *take* online exams, and submit *assignments.* In *addition,* to enable students to attend online classes, **it** ***requires*** a fast internet connection. Students have to spend a lot of money to enable them to take online classes more effectively.	**1 error undetected;** 2 incorrect suggestions; 1 unnecessary suggestion
Grammarly	Firstly, **covid 19** has changed the lives of *students* in terms of *the* financial cost. Many students feel burdened when they have to spend money to buy internet data to enable them to attend online classes, online exams, and submit *an* assignment. In *addition*, to enable students to attend online classes, **it required** a fast internet connection. Students have to spend a lot of money to enable them to take online classes more effectively.	**3 errors undetected;** 1 incorrect suggestion; 1 unnecessary suggestion
Ginger	Firstly, **covid 19** has changed the lives of *students* in terms of financial cost. Many students feel burdened when they have to spend money to buy internet data to enable them to attend online classes, online exams and submit *assignments*. In **additional**, to enable students to attend online classes, **it required** a fast internet connection. Students have to spend a lot of money to enable them to take online classes more effectively.	**4 errors undetected**

Body Paragraph 2 Firstly, **(?)** Covid-19 pandemic has changed my learning method. Nowadays, I **had** to study online and this has caused some problems **to** me. **The** problem **such as** bad internet connection when **I** in online classes **and** it is very difficult for me to focus and understand the topic that my **lecture discusses** in online classes. This probably will cause me **left** behind **in** that topic.	11 errors
Author's suggestions	Firstly, *the* Covid-19 pandemic has changed my learning method. Nowadays, I *have* to study online and this has caused some problems *for* me. *A* problem *is* bad internet connection

	when *I am* in online *classes, so* it is very difficult for me to focus and understand the topic that my *lecturer is discussing* in online classes. This probably will cause me *to be left* behind *on* that topic.	
QuillBot	Firstly, *the* Covid-19 pandemic has changed my learning method. Nowadays, I *have* to study online and this has caused some problems *for* me. The *problems* such as bad internet connection when I *am* in online classes, *make* it very difficult for me to focus and understand the topic that my **lecture discusses** in online classes. This probably **cause** me *to be* left behind *on* that topic.	**2 errors undetected;** 1 incorrect suggestion
Grammarly	Firstly, *the* Covid-19 pandemic has changed my learning method. Nowadays, I **had** to study online and this has caused some problems *for* me. **The** problem *is* **such as** bad internet connection when I *am* in online classes **and** it is very difficult for me to focus and understand the topic that my **lecture discusses** in online classes. This probably will cause me **left** behind *on* that topic.	**7 errors undetected**
Ginger	Firstly, **(?)** Covid-19 pandemic has changed my learning method. Nowadays, I **had** to study online and this has caused some problems *for* me. **The** problem such as *a* bad internet connection when **I** in online classes **and** it is very difficult for me to focus and understand the topic that my **lecture discusses** in online classes. This probably will cause me **left** behind **in** that topic.	**9 errors undetected**

Body Paragraph 3 Covid-19 has greatly affected **student's finance**. It is because **we** need to spend more money **for the** online learning. For example, **[cost** of buying internet **(?)** every **monthly**.**]** Furthermore, **we** also have to purchase reference books from outside book suppliers. **In** summarize, the cost of learning **carry** by students **increases** due to this virtual learning technique following Covid-19.	13 errors including fragment	
Author's suggestions	Covid-19 has greatly affected *students' finances*. It is because *they* need to spend more money *on* online learning. For example, *they need to bear the* cost of buying internet *data* every *month*. Furthermore, *they* also have to purchase reference books from outside book suppliers. *To* summarize, the cost of learning *borne* by students *has increased* due to this virtual learning technique following Covid-19.	

QuillBot	Covid-19 has greatly affected *students' finances*. It is because **we** need to spend more money *on* online learning. For example, [*the* cost of buying **the** internet **(?)** every *month*.] Furthermore, **we** also have to purchase reference books from outside book suppliers. In *summary*, the cost of learning **carried** by students *has increased* due to this virtual learning technique following Covid-19.	**4 errors** and fragment undetected; 1 incorrect suggestion
Grammarly	Covid-19 has greatly affected **student's finance**. It is because **we** need to spend more money *on* online learning. For example, [*the* cost of buying internet **(?)** every *month*.] Furthermore, **we** also have to purchase reference books from outside book suppliers. *To* summarize, the cost of learning **carry** by students **increases** due to this virtual learning technique following Covid-19.	**7 errors undetected** and fragment flagged but not corrected
Ginger	Covid-19 has greatly affected *student *financial**. It is because **we** need to spend more money **for the** online learning. For example, [*the* cost of buying internet **(?)** every **monthly**]. Furthermore, **we** also have to purchase reference books from outside book suppliers. *To* summarize, the cost of learning **carry** by students **increases** due to this virtual learning technique following Covid-19.	**8 errors** and fragment undetected; 1 incorrect suggestion

Conclusion 1 To conclude, Covid-19 **gives the** impact to many people **(?)** especially **the student.** As **the** student, I should overcome this problem and **adapt** the new norms. Although I do not know when this pandemic will end **(?) but** I have to survive to **archive** my dream. Lastly, I hope we can find **the** cure **so** I can become **the** normal student again.		13 errors
Author's suggestions	To conclude, Covid-19 *has given an* impact to many people, especially *students*. As *a* student, I should overcome this problem and adapt *to* the new norms. Although I do not know when this pandemic will end, I have to survive to *achieve* my dream. Lastly, I hope we can find *a* cure so *that* I can become *a* normal student again.	
QuillBot	To conclude, Covid-19 *has an* impact *on* many people, especially *students*. As *a* student, I should overcome this problem and adapt *to* the new norms. Although I do not know when this pandemic will end, I have to survive to **archive** my	**2 errors undetected**

	dream. Lastly, I hope we can find *a* cure **so** I can become *a* normal student again.	
Grammarly	To conclude, Covid-19 **gives** *an* impact *on* many people **(?)** especially **the student**. As *a* student, I should overcome this problem and *adopt* the new norms. Although I do not know when this pandemic will end **(?) but** I have to survive to **archive** my dream. Lastly, I hope we can find **the** cure **so** I can become *a* normal student again.	**8 errors undetected;** 1 incorrect suggestion
Ginger	To conclude, Covid-19 **gives the** impact to many people, especially **the student.** As **the** student, I should overcome this problem and **adapt** the new norms. Although I do not know when this pandemic will end, **but** I have to survive to *achieve* my dream. Lastly, I hope we can find **the** cure **so** I can become **the** normal student again.	**10 errors undetected**

Conclusion 2 **As** conclusion, **(?) covid-19** pandemic **gives** an impact to many people **(?)** especially **the** students **in** financial cost, learning method and time management. However, students must find the solution **on** how to survive and prove that **we** can **adapt** this pandemic. **We** must show that this pandemic can't stop **us** from being **success** in **our** studies despite the various challenges **we will** face.	16 errors
Author's suggestions	As *a* conclusion, *the C*ovid-19 pandemic *has given* an impact to many people, especially students in *terms of* financial cost, learning method and time management. However, students must find the solution to survive and prove that *they* can adapt *to* this pandemic. *They* must show that this pandemic can't stop *them* from being *successful* in *their* studies despite the various challenges *they have to* face.
QuillBot	*In* conclusion, *the COVID*-19 pandemic *has an* impact *on* many people, especially students, **in** financial cost, learning methods and time management. However, students must find *a* solution *to* how to survive and prove that **we** can adapt *to* this pandemic. **We** must show that this pandemic can't stop **us** from *succeeding* in **our** studies despite the various challenges **we will** face.	**7 errors undetected**
Grammarly	*In* conclusion, *the* **covid**-19 pandemic **gives** an impact *on* many people **(?)** especially **the** students **in** financial cost,	**11 errors undetected;**

	learning *methods*, and time management. However, students must find the solution **on** how to survive and prove that *they* can adapt *to* this pandemic. **We** must show that this pandemic can't stop **us** from being *a* success in **our** studies despite the various challenges **we will** face.	1 incorrect suggestion
Ginger	As *a* conclusion, **(?)** **covid**-19 pandemic **gives** an impact to many people, especially **the** students **in** financial cost, learning method and time management. However, students must find the solution **on** how to survive and prove that **we** can **adapt** this pandemic. **We** must show that this pandemic can't stop **us** from being *successful* in **our** studies despite the various challenges **we will** face.	**13 errors undetected**

Conclusion 3 In conclusion, these are the **affect** I felt the most during the **covid-19 (?)**, **that** my learning was disrupted, **also** it was quite difficult for me to interact with friends and of course **(?)** my assignments increased. **For all that, this cause** me to **be lost** a lot of my focus during the online **class** and it **is** so hard **to** me to **catch up** all the learning. I hope that someday this disease will be gone and **can** live my normal life as before.		15 **errors**
Author's suggestions	In conclusion, these are the e*ffects* I felt the most during the *Covid-19 pandemic*: my learning was disrupted, it was quite difficult for me to interact with friends and of course, my assignments increased. All these caused me to *lose* a lot of my focus during the online *classes* and it *was* so hard *for* me to catch up *with* all the learning. I hope that someday this disease will be gone and *I* can live my normal life as before.	
QuillBot	In conclusion, these are the *effects* I felt the most during **(?)** COVID-19 **(?)**. *My* learning was disrupted, it was quite difficult for me to interact with friends**,** and**,** of course, my assignments increased. **For all that, this** *caused* me to *lose* a lot of my focus during the online **class,** and it **is** so hard *for* me to catch up *with* all the learning. I hope that someday this disease will be gone and *I will be able to* live my normal life as before.	**6 errors undetected;** 2 unnecessary suggestions
Grammarly	In conclusion, these are the **affect** I felt the most during the **covid-**19 **(?)**, **that** my learning was disrupted, **also** it was quite difficult for me to interact with friends and of course **(?)** my assignments increased**. For all that, this cause** me to **be lost** a lot of my focus during the online **class** and it **is** so hard	**All errors undetected**

	to me to **catch up** all the learning. I hope that someday this disease will be gone and **can** live my normal life as before.	
Ginger	In conclusion, these are the *effect* I felt the most during the **covid**-19 **(?)**, **that** my learning was disrupted, **also** it was quite difficult for me to interact with friends and of course **(?)** my assignments increased. **For all that**, **this** *causes* me to **be lost** a lot of my focus during the online **class** and it **is** so hard *for* me *catching* up **(?)** all the learning. I hope that someday this disease will be gone and **can** live my normal life as before.	**10 errors undetected;** 3 incorrect suggestions

On checking the nine student paragraphs, the author identified 95 errors in total. Again, none of the three grammar checking tools was able to detect all errors. This is not surprising because all three software were also unable to identify all of the 41 errors at sentence level. A summary of the performance of the three free grammar checkers at paragraph level is shown in Table 2.

Table 2
Performance of QuillBot, Grammarly and Ginger at Paragraph Level

Online Grammar Checker	Undetected errors (n)	Undetected fragments (n)	Paragraphs with all errors detected (n)	Paragraphs with all errors undetected (n)	Incorrect suggestions (n)	Unnecessary suggestions (n)
QuillBot	31	1	0	0	6	4
Grammarly	52	0	0	1	6	1
Ginger	72	1	0	0	5	0

It is evident from Table 2 that QuillBot again outperformed the other two grammar checkers. It had failed to flag the least number of errors and Ginger was the worst performing software. As Ginger had the lowest rate of error detection, it would not be surprising if its number of incorrect recommendations were low as well. However, it actually provided almost the same number of inaccurate suggestions as the other two grammar checkers. The finding that Grammarly, the leading grammar checking tool provided wrong feedback echoes previous studies (Nova, 2018).

Similar to the sentence-level test results, both QuillBot and Ginger failed to flag the sentence fragment in sample body paragraph 3. The finding that the free version of Grammarly flagged the incomplete sentence but did not correct it is not surprising because this error is categorized as a serious error which is corrected only for users of its paid version, Grammarly Premium. This is possibly also the same reason why the free version of Ginger did not flag the fragment error and thus no feedback was provided.

It is interesting to note that QuillBot which had not suggested the use of the Oxford (serial) comma at sentence level, did however, offer this suggestion at the paragraph level. Another surprising result is the 15 errors in sample conclusion 3 were altogether missed by the free version of Grammarly. This is unexpected as in a recent study by Subham et al. (2020), Grammarly was found to be the top performing tool compared to Ginger, ProWrittingAid, LanguageTool and After the Deadline. In contrast, the free version of the Ginger software managed to detect four errors in the same paragraph but unfortunately, only one suggestion was correct while the other three were not.

Overall, based on the results of the paragraph-level tests, QuillBot is the most reliable grammar feedback program but it still is not completely accurate. Among the pitfalls noted are it missed errors and provided incorrect feedback. These shortfalls of QuillBot are similar to those of other automated feedback tools (Cavaleri & Dianati, 2016; Park, 2019).

CONCLUSION AND RECOMMENDATIONS

The purpose of this paper was to report on the robustness of a new tool, the QuillBot grammar checker using authentic writing samples from the author's second-year diploma students consisting of ten sentences and nine paragraphs. The free version of two popular online grammar checking tools, Grammarly and Ginger were also tested for comparison purposes.

The findings from the sentence- and paragraph-level tests on actual student writing indicate that the new free QuillBot grammar checker is the best performer compared to the free versions of Grammarly and Ginger. The tests also confirm that all three tools are not 100 per cent accurate. The finding that the leading Grammarly software is not flawless is consistent with those of recent research. In a study to evaluate the accuracy of Grammarly, Dodigovic and Tovmasyan (2021) concluded that second language users should not depend on its feedback alone due to its inaccuracy. As the current automated feedback programs are not sufficiently accurate, they should be used to supplement teacher feedback instead of being used independently (O'Neill & Russell, 2019; Woodworth & Barkaoui, 2020). Therefore, when integrating grammar checkers in an ESL context, teachers should warn students that they cannot rely on such tools blindly by accepting all suggested revisions. Furthermore, these applications may miss errors, so it is advisable for students to manually check their work for undetected errors. As Ranalli (2018) found that students may not know how to correct a sentence when the automated feedback is general, for example, *Consider revising this sentence*, students should not just ignore the vague feedback but seek teacher guidance to rewrite the sentence.

Even though grammar checkers are not comprehensive, previous studies have shown that the use of these automated corrective writing tools has a positive impact on language development. In a recent study, John and Woll (2020) found that grammar checking tools can be effectively utilised to help students identify selected grammar errors in their written work. Thus, in the upcoming semesters, the author will require her students to incorporate the free QuillBot grammar checker while writing to enhance their grammatical accuracy. As students will receive

individualized, just-in-time feedback, it should be beneficial to them in terms of greater self-directed learning (Daniels & Leslie, 2015). This means that students would learn to self-edit their own written work without having to wait for teacher corrective feedback.

With students using this helpful software, less of the author's time will be spent checking for correct grammar. More importantly, she will have more time to focus on giving feedback on two other important writing concerns: the content and the organisation of a piece of written work. Hopefully, students will be motivated to produce better quality writing output with the combined written corrective feedback from QuillBot and their lecturer.

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