INCORPORATION OF THE COMPUTER-ASSISTED WRITING PROGRAMME IN TEACHING WRITING TO ENGINEERING STUDENTS.

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ABSTRACT

Effective English writing has long been a challenge in English language teaching and learning. Computer-assisted language learning (CALL) has provided another perspective for ESL writing. A writing software application is useful to assist the teachers in assessing the students’ writing as well as to enhance learner autonomy. This study explores the perceptions of a computer-assisted writing programme implemented among engineering students. It also investigates the effectiveness of using the selected online software in ESL writing. 37 participants were introduced to the online writing software; ProWritingAid. Pre-test and post-test written essays were also used to examine the effectiveness of computer-assisted writing programme implemented to the students. A survey was conducted to gain the students’ feedback while the data obtained from pre-test and post-test was analysed by using Statistical Package for Social Sciences (SPSS). The results of this study show positive effects in the post-test and majority of the students have gained the benefits by using the computer-assisted writing programme to revise their essays.

Keywords: Computer-assisted writing programme; computer-mediated feedback; learner autonomy; engineering students.

INTRODUCTION
In recent years, Malaysian industries demand engineers who are not only proficient in technical and communication skills but also have the ability to write well. It is imperative for the engineering students to master the writing skills as it is the most essential and common form of professional communication as they are responsible to transmit the results of their findings, research and application to other people (Reddy, 2016). However, writing has for a long time been claimed as a very difficult skill to acquire and dreaded by ESL students (Gupta, 1998). This is because it does not only involve a representation of words, but also development and organization of thoughts in a structured way (Maryam & Hamid, 2012).

Today, ESL researchers and teachers are still looking for new and better ways to assist their students learn to write effectively and accurately. Educators in the field of language teaching always try to find ways to make language learning more enjoyable and attractive for the learners (Kilickaya, 2009). Various activities, games, stories and other engaging materials have been designed with so much energy and time spent in order to help these language teachers to achieve this aim. Later, the approaches have evolved as at the beginning of 1960s, computers have been used for language teaching (Warschauer & Healey, 1998).

The growth of advanced information and communication technology (ICT) in Malaysia has been seen in teaching and learning ESL writing as variety of computer software applications and tools can be used for example: emails, websites, blogs, word processors and online discussions. Besides that, computer-assisted language learning (CALL) has also played an increasingly important role in writing instruction and research, and researchers of both native and non-native language learning have paid close attention to how computers have transformed the writing process in the classroom (New, 1999; Otolowski, 1998).

Reid (1997) suggested all L2 writers, and especially those having challenges in accuracy, need additional linguistic instruction, careful analyses of their writing weaknesses by professionals in the field of teaching EFL, and consistent support and resources to improve their writing skills. ESL writing teachers often face the problem to spend their time on teaching the accuracy in writing but since a student’s difficulty with form will not automatically diminish over time, these teachers do not wish to neglect accuracy completely (Lim, 2010). Thus, the advancement of technology can be useful to assist the teachers in assessing the accuracy of the students’ writing as well as to enhance learner autonomy. According to Williams (2005), if the use of the computer software is carefully modelled, it can offer students both assistance and autonomy in the writing process. Furthermore, Milton (1997) suggested the use of computer programmes to serve the aim of the autonomous development of writing skills, particularly for EFL writers.

A study conducted by Warschauer, Turbee & Roberts (1996) concluded that the use of computer in language teaching have the potential to empower students when they are used appropriately and provides some pedagogical suggestions for the effective use of computer networking in ESL/EFL.
classrooms. Besides that, Fang (2010) showed that the majority of students benefited by using the computer-mediated feedback to revise their essays while Yang (2004) reported students’ positive attitudes toward the automated essay grader tool, in terms of the rapid speed feedback. A research by Kilickaya (2009) found that the teachers participated in the study were interested to make use of the CALL tools in their future career.

On the other hand, other studies have shown negative effects for novice writers (Brock, 1990; Pennington & Brock, 1990). Pennington and Brock (1990) noticed that when ESL students used a text analyser alone without teacher feedback, the results were the writers tended to accept the analyser’s suggestions, even when those alternatives were inappropriate. A study conducted by Brock (1990) suggested that L2 writing errors are more idiosyncratic and harder to classify than L1 errors. Besides that, Chen & Cheng (2006) reported the students’ dissatisfaction with the computerised feedback as it failed to offer specific feedback concerning the essay content.

Despite the increasingly popular use of computer for language teaching and learning, an investigation into the effect of using writing software to help engineering students learn writing is scarce. Therefore, the present study focuses on obtaining a clearer understanding of the students’ perceptions and the effectiveness of the selected computer-assisted writing programme in order to serve the aim of autonomous development of writing skills among engineering students in a Malaysian university.

LITERATURE REVIEW

Computer-Assisted Language Learning (CALL)

Education is facing a paradigm shift. It cannot be denied that the amazing development of computer technology has led to a much greater attention paid to educational technologies in teaching and learning. It is useful to integrate CALL in the teaching and learning experience. ESL learners often think that writing is a difficult task due to its complexity compares to the other language skills. According to Scarcella (1984), the writer needs to utilize high-order thinking skills as well as communication skills including conceptualisation, inference, creativity, organisation and the summarisation of complicated ideas. Therefore, it is essential for teachers to employ effective writing instruction for L2 learners. Recently, a variety of writing softwares have been used widely in and outside of the classroom to improve the students’ writing skills (Warschauer and Grimes, 2008). Thus, Hubbard (2011) asserted that writing was “revolutionized” for everyone with word processing and the addition of spell checkers has been quite useful. Technology revolution in CALL should allow students to read, write, and rewrite the world in their English classes as never before, “but only if we too enable our students to use the full power of these technologies” (Warschauer, 2004). Fidaoui et al. (2010) proposed that CALL should be implemented within the writing classroom taking into consideration that students should learn how to access reliable websites for
location and selection of relevant information and be guided to accomplish the requirements of their written tasks.

**Computer Mediated Feedback**

A developing body of research has begun to clarify a growing relationship between types of feedback and second language learning in face-to-face interaction (Ammar & Spada, 2006). With the instruments of technology, feedback is delivered via written computer mediated communication which holds particular promise for the learning of language. Regardless of the potential advantages of computer mediated communication to facilitate the language learning, research on learning outcomes following computer mediated feedback is still limited (Loewen & Erlam, 2006). Some studies (Caws, 2006; Duff & Li, 2009) have emphasised on investigating the effect of computer mediated feedback method using WebCT, email and Word on participants’ attitudes, and reported that it was quite helpful for the development of students' writing. Besides that, other researchers compared the effectiveness of computer mediated feedback and traditional feedback. For example, Yeha and Lob (2009) created an online feedback and error analysis system called Online Annotator for EFL Writing. The findings showed that students revealed significantly better performance on recognizing writing errors with the feedback given online. They discovered that the feedback delivered via computer was quite useful for the development of students' writing abilities. Similarly, Ho and Savignon (2007) found out that computer mediated feedback has the ability to promote language learning and to help learners in finding errors and correcting them. Oskoz and Elola (2011) also stated that computer mediated feedback helped learners in refining the organization of their essays, thus becoming better writers.

**Learner Autonomy**

One of the challenges faced by language teachers is to generate students to become self-reliant, autonomous learners who can pursue their own learning and survive outside the sheltered environment of the classroom. Learner autonomy in language learning is not new. The significance of learner autonomy in language learning is long established and well-documented (Dam, 1995). One important principle of learner autonomy is the emphasis on the role of the learner rather than the role of the teacher. The teacher functions as a counselor and a facilitator whose position is to manage the activities in the classroom and maintain learning environment that encourage learners to view learning as a lifelong process (Jacobs & Farrell, 2001). The learner’s role is to take control of their learning (Holec, 1980). If learners are to become more self-directed and autonomous, it is vital to create scaffolding activities which they can work on and benefit from, so as to eventually reach the desired goals. Jones (2001) stated that teachers play a huge role in developing learner autonomy in Computer-Assisted Language Learning (CALL). This appears to be resonant with Blin’s (2004) point of view that technology may be used to promote certain aspects of learner autonomy such as learning at one’s own pace, freedom to choose materials, and the opportunity to exercise some
control over the learning process. Therefore, students are able to learn well using technology that “even with minimal intervention from the teacher, the students participated actively and learnt better (Nor Fariza Mohd Nor et al., 2012).

**An overview of the writing software used in this study.**

The use of ProWritingAid software was implemented to 37 pre-degree engineering students in their Communicative English course offered by Centre for Language Studies at a technical university in Malaysia. The instructor decided to adopt ProWritingAid to supplement classroom instruction as it is convenient for the students since it provided free online version for them. This was the first time computer-based writing software had been applied to any pre-degree students in this university.

ProWritingAid is developed by Orpheus Technology served as the students’ online editor and personal coach to improve the writing skills by analysing the consistency, plagiarism, acronyms, clichés, redundancies and grammar mistakes. The free version runs on the first 500 words of the students’ essays. Full reports were available by purchasing the premium version, or if the students sign up for a 14-day free trial. In order to assist the students, ProWritingAid also does the following:

- Check for consistency of spelling, hyphenation, and capitalisation;
- Eliminate clichés and redundancies;
- Check for plagiarism and unoriginal content;
- Online grammar and spelling checker;
- Improve readability;
- Find overused words;
- Improve dull paragraph structure;
- Find repeated words and phrases;
- Eliminate vague, abstract, and complex words from your writing;
- High quality copy-editing and proofreading services;

The students were exposed on the user-friendly features of the writing software and were asked to do their independent learning for the writing tasks given.

**RESEARCH OBJECTIVES**

1. to examine the effectiveness of using a selected computer-assisted writing programme by comparing the performance in pre-test and post-test.

2. to explore the students’ attitudes of using the writing software in ESL writing.

**RESEARCH QUESTIONS**
Scope: Nationalism, Community Development and Ethnic Relations

1. To what extent does the computer-assisted writing programme give effects in learning writing among the engineering students?

2. What are the students’ attitudes of using the writing software in ESL writing?

METHODOLOGY

Research Design

This research study utilized a quantitative method design. The participants were 37 pre-degree engineering students enrolled in Communicative English course offered by Centre of Language Studies at a technical university in Malaysia. The participants were volunteered to take part in the study. The students were from various educational backgrounds as some of them had completed their diploma, Sijil Tinggi Pelajaran Malaysia (STPM) and Matriculation. Their English proficiencies were between Band 2 and 3 according to Malaysian University English Test (MUET).

Sampling

The study made use of a convenience sampling which was one of non-probability sampling techniques. It was a statistical method of drawing representative data by selecting people because of the ease of their volunteering or selecting units as they were available or an easy access to the researcher. However, it should be noted that the sample might not represent the population as a whole.

Data Collection Method

In this study, several instruments were used which included questionnaire distributed to the participants and writing tests for pre and post-test. The questionnaire were used to explore the participants’ attitudes regarding their experience in using the computer-assisted writing programme while the marks obtained from the tests and the writing scripts were used to analyse the performance of the students.

The questionnaire utilised two types of question namely, likert scale and checklist. There were 10 items and based on their experience, they were asked to give feedbacks on the use of the writing software in ESL writing. The survey was carried out anonymously to reduce the potential of uncomfortable feelings among the respondents. All the items took between 5 to 7 minutes to be answered.

Besides that, pre- and post-tests were implemented in this study. The tests were used to measure the performance of the students before and after the application of ProWritingAid software in the students’ writing tasks.

The pre-test
A pre-test was carried out to the students before the experiment was done to compare the results after the writing software was implemented in their writing activities. They were not informed of the purpose of the experiment so as to confirm that their writing abilities were at the same level. The pre-test was an in-class writing test in which students were given respectively 50 minutes to write an essay within 350 words based on the information given in the rubric. Then, implementation of using the ProWritingAid software was done in teaching and learning writing session to find any significant effect of the treatment.

The Implementation of ProWritingAid Software in Writing Activities

The researchers adopted ProWritingAid software in teaching and learning writing for 3 weeks. Students were exposed and guided to the functions and the features of the software for examples, how to paste and upload the essay, how to read the report summary provided by the software as well as to check the grammar, writing style, overused words and redundancies in their essays. A few demonstrations were done to ensure the students understand how to use the software independently. They were also encouraged to discuss with their peers about the results they obtained from the software analysis after they had completed their tasks.

The Post-test

The researchers employed a post-test to evaluate the participants’ performance in writing and to find any significant effects from the treatment given to the group. As conducted in pre-test, the post-test was an in-class writing test in which students were given respectively 50 minutes to write an essay within 350 words. Different rubric was used but it contained the same difficulty level as it changed only the situation of the topic.

Data Analysis Method

In this study, comparison was done on the performance in pre-test and post-test of the students. The scores of the writings were calculated to find the mean scores. The results were then analysed by using t-test application in SPSS (Statistical Package for the Social Sciences) to find the mean score, standard deviation, t-value and p-value. The researcher used Independent-sample t-test as the comparison was made based on the results of the group for example, comparing the pre and post-test.

The next stage was to obtain feedbacks from the participants regarding their experience using ProWritingAid software in completing their writing tasks. The students were given the questionnaire link through online which was made available for two weeks to respond. The data was later calculated and presented in percentages except for the open-ended type of question.
FINDINGS & DISCUSSION

The effects of the implementation of ProWritingAid software in writing

In order to examine the effectiveness of the use of ProWritingAid software in writing among engineering students, the researchers analysed the scores for both the following instruments in the quantitative analysis.

The hypothesis

Based on Research Question 1, a null hypothesis was formed and the results of the findings could be referred in the following table.

Ho: There is no improvement in the students’ writing performance when they use ProWritingAid software.

Table I: Results of pre-test and post-test scores.

<table>
<thead>
<tr>
<th>Paired Samples Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Pair 1</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

Table II: Summary of the pre-test and post-test scores.

<table>
<thead>
<tr>
<th>Paired Samples Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paired Differences</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>-0.54054</td>
</tr>
</tbody>
</table>

8
Comparison of Pre-test and Post-test Scores

The analysis was done by using SPSS version 20.0. The researcher adopted t-test application to measure the writing performance among the students. Pair 1 in the Table I shows the mean scores of pre-test and post-test for the group. The mean score of the post-test (18.8378) is higher than the pre-test (18.2973). This result indicates that the treatment has given positive effects on students’ writing performance.

Besides that, a comparison was made to measure the performance of the group between their pre-test and post-test. It can be said the group shows improvement after the pre-test. It can be referred in Pair 1 Table II where the results show significant difference between the pre-test and post-test ($t= -2.275$, $p= .029<0.5$). As it shows significant difference, it rejects the H null. This evidence concludes that the implementation of writing software helps the students to perform better in their ESL writing compared to normal approach (without using the software).

Students’ attitudes toward using ProWritingAid as an essay analyser and writing tool.

Items 1 to 5 relate to the use of ProWritingAid as an essay analyser (see Table III) while items 6 to 8 relate to the use of the software as a writing tool (see Table IV). The questionnaire was designed with a minimum of 80 percent as benchmark of the overall results to indicate the degree of students’ agreement about the use of the writing software. We consider agree and strongly agree as positive feedback while disagree and strongly disagree as negative feedback.

Table III: Students’ attitudes toward using ProWritingAid as an essay analyser.

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel satisfied with the automated analysing system of ProwritingAid software.</td>
<td>0%</td>
<td>6.9%</td>
<td>37.9%</td>
<td>55.2%</td>
</tr>
<tr>
<td>2. I feel satisfied with the computer feedback to the organisation of paragraphs offered by the automated analysing system.</td>
<td>0%</td>
<td>3.4%</td>
<td>48.3%</td>
<td>48.3%</td>
</tr>
<tr>
<td>3. I feel satisfied with the computer feedback to the content of my essay</td>
<td>0%</td>
<td>0%</td>
<td>42.9%</td>
<td>57.1%</td>
</tr>
</tbody>
</table>
The results in Table III show that majority of the students give positive feedbacks as 93.1 percent are satisfied with the automated analysing system of the software, while 6.9 percent of them disagree with this. Next, the table shows 96.6 percent are satisfied with the computer feedback to the organisation of paragraph offered by the software while 3.4 percent were not satisfied. On the other hand, all of the students (100 percent) are satisfied with the computer feedback to the content of their essays, English vocabulary analysis as well as the English grammar analysis offered by the writing software.

Table IV: Students’ responses to the use of ProWritingAid as a writing tool.

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. I will read the computer feedback and revise my essays after using Prowritingaid.</td>
<td>0%</td>
<td>0%</td>
<td>37.9%</td>
<td>62.1%</td>
</tr>
<tr>
<td>7. I will correct my grammar and revise my essays after using Prowritingaid.</td>
<td>0%</td>
<td>3.4%</td>
<td>37.9%</td>
<td>58.6%</td>
</tr>
<tr>
<td>8. Writing essays with Prowritingaid helps me to improve my English writing.</td>
<td>0%</td>
<td>3.4%</td>
<td>44.8%</td>
<td>51.7%</td>
</tr>
</tbody>
</table>

Based on Table IV, the results show that all of the students (100 percent) give positive responses to read the computer feedback and revise their essays after using the writing software. Nearly 97 percent of them agree to correct their grammar mistakes and believe that the software has helped them to improve their English writing. There are only 3.4 percent of them disagree with these statements.
Figure 1. Learners’ preferences of the functions of the writing software.

This item was designed as a checklist question where the students were asked to choose the functions useful for the feedback of their writing. The results confirm that most of the students; 89.7%, opt for the grammar checker offered by the software followed by writing styles checker; 48.3%, overused word checker; 41.4%, sentence length checker; 37.9% and the least preferred is redundancies checker; 17.2%.

**Reasons for using the writing software**

This item was designed as an open-ended question where the students were asked to give their opinions if they prefer to use the writing software in the future. Their feedbacks were then grouped into several themes.

Firstly, the students found the software helped them to learn writing skills and do their exercises independently. This was due to the fact that the functions provided in the software was user-friendly as they requires less assistance from their instructor. Secondly, the students favoured the software as it improve their writing especially when it highlighted spelling and grammatical mistakes. These particular functions helped them to write better sentences as they could correct their spelling and grammatical mistakes thus producing better piece of writing. Thirdly, the students preferred using the software as it gave immediate feedback once the writing was uploaded compared to manual feedback given by the instructor. Lastly, the software was available online, making it convenient to be accessed outside of class.

**Conclusion and Recommendation for Future Research**

Based on the findings presented, it can be summarised that ProWritingAid is able to help the participants in the writing process in terms of analysing their grammar, sentence length, writing styles, overused words and redundancies of their essays. The findings of this research corroborate with other studies
(Fang, 2010, New, 1999) which showed overall positive effects of using CALL on ESL writing performance. However, several limitation have to be noted here. First, the subjects of this study were only 37 students enrolled in Communicative English class at a technical university in Malaysia. The findings are limited to subjects with a background similar to those participating in this project thus, the findings cannot be generalised to students of different levels. Moreover, to better understand the effects using CALL on ESL writing performance, future research studies may focus on examining the effects of adopting the writing software between an experimental group and control group by using a pre-test and post-test approach. It would also be interesting to look into the challenges faced by both teachers and learners during the implementation of the writing software in the class.

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