



UNIVERSITI PUTRA MALAYSIA

***EFFECTS OF GRAMMARLY APPLICATION ON ESL STUDENTS'
CONSTRUCTION OF GRAMMATICALLY CORRECT SENTENCES IN
ESSAY WRITING***

KALPANA JAYAVALAN

FPP 2018 10



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WRITING**

By

KALPANA A/P JAYAVALAN

**Thesis submitted to the School of Graduate Studies, Universiti Putra Malaysia, in
Fulfilment of the requirements for the Degree of Masters of Science**

October 2017

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

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October 2017

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The purpose of this study is to investigate how a grammar checker application that is, Grammarly helps the students in constructing grammatically correct sentences in writing essays. In the Malaysian context of English language learning, the major difficulty that the students encounter is writing and it has always been the reason why students cannot excel in the examination (Chuo, 2004). Thus, this study explores the effects of Grammarly, a grammar checker computer application, in aiding secondary students' in constructing grammatically accurate sentences. The research is guided by the theories and principles of Vygotsky's (1978) Zone of Proximal Development (ZPD) and Knowles' (1984) Self-Directed Learning approach. This study employs a quantitative research methodology, which is quasi experimental approach with the non-equivalent control group design. Participants in this study were 60 Form Four students from two different classes in a public secondary school in a state in western part of Peninsular Malaysia. They were divided equally into an experimental and a control group and the students came from the same age group and English language, particularly English writing proficiency. The data was gathered for research through pre-and post-tests which were then analysed using paired sample T-test. Continuous quantitative type of observation data (i.e., scores from writing exercises) were also obtained from their engagement with series of treatment using the Grammarly grammar checker application. The findings revealed that the grammar checker aids the students in order to construct sentences which are grammatically accurate in essay writing. The results of this study revealed that at $P < .001$ alpha level the grammar checker does aid sentence construction which are grammatically correct when it comes to writing essays among the Form 4 students, particularly on their use of correct grammar functions (namely subject-verb agreement, sentence structure, spelling, and punctuation). The researcher calls for more future research on the grammar checker as it holds an opportunity for the students to progress in their various types of essay writing. It might be a great shift from a traditional learning approach to a more independent self-directed learning approach among students.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia Sebagai memenuhi keperluan Ijazah Master Sains

**KEBERKESANAN PEMERIKSA TATABAHASA ATAS TALIAN DALAM
MEMPERTINGKATKAN PENULISAN KARANGAN JENIS NARATIF
BAHASA INGGERIS PELAJAR SEKOLAH
MENENGAH**

Oleh

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Oktober 2017

Pengerusi : Abu Bakar bin Mohamed Razali, PhD
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Tujuan kajian ini adalah untuk menyiasat samada aplikasi 'grammar checker', iaitu, 'Grammarly' mempunyai kesan positif terhadap penulisan penceritaan pelajar sekolah menengah. Dalam konteks pembelajaran Bahasa Inggeris, kesukaran utama yang dihadapi oleh pelajar adalah penulisan dan selalunya adalah faktor mengapa pelajar tidak cemerlang dalam peperiksaan (Chuo, 2004). Justeru, kajian ini menerokai keberkesanan 'Grammarly' dalam membantu penulisan karangan jenis naratif pelajar Sekolah Menengah. Kajian ini berteraskan dua theory, iaitu theory ZPD (Zone of Proximal Development) oleh Vygotsky (1978) dan 'Self-Directed Learning' atau pembelajaran sendiri oleh Knowles (1984). Kajian ini menggunakan kaedah kuantitatif, iaitu kuasi-eksperimental kumpulan 'non-equivalent'. Sampel untuk kajian ini terdiri daripada 60 pelajar Tingkatan 4 dari dua kelas berbeza di sebuah sekolah menengah di Semenanjung Malaysia. Mereka dikategorikan kepada kumpulan kawalan dan eksperimental yang berteraskan kepada kumpulan umur serta kefasihan Bahasa Inggeris yang sama tahap. Data kajian diperolehi daripada ujian pra dan pasca yang kemudiannya dianalisa menggunakan ujian 'paired T-test. Pemerhatian yang berterusan (iaitu dari skor latihan penulisan) juga diperolehi daripada penglibatan pelajar dengan penggunaan 'Grammarly'. Hasil dapatan kajian membuktikan bahawa 'grammar checker' membantu dalam penulisan karangan jenis naratif terutamanya dari segi pembinaan ayat. Ia juga membuktikan bahawa tahap $P < .001$ dan ini menjelaskan keberkesanan 'grammar checker' dalam penulisan pelajar Tingkatan 4 khususnya dalam penggunaan tatabahasa yang betul (subjek dan predikat, ejaan, struktur ayat dan tanda bacaan). Pengkaji menjelaskan bahawa kajian lanjutan mengenai 'grammar checker' adalah penting dalam peningkatan tahap penulisan karangan jenis penceritaan dan anjakan paradigma dalam pengajaran Bahasa Inggeris yang tradisional kepada kaedah yang lebih berkesan.

ACKNOWLEDGEMENTS

A big number of people have contributed to the thesis to be a reality. I would like to express my greatest thanks and gratitude to each and every one of them. Firstly, I would like to my supervisor and co supervisor who were the greatest reason to the completion of my study and thesis. They are Dr. Abu Bakar Mohamed Razali and Dr. Noreen Noordin who had never given up with me and always guided and gave moral support for me to continue with my research. I would like to express my gratitude to School of Graduate Studies (SGS) for always being helpful and good guidance especially during registration. Not only that, it was also a great help especially dealing with documentations and registration of courses. In addition, I would like to thank God for blessing me with the greatest parents who have the greatest passion to encourage me to complete the thesis. Next, is my beloved husband who had never given up hope and provided me with sheer strength during the tough time. His confidence and the hope he had actually guided me in the journey of reaching success.

I certify that a Thesis Examination Committee has met on date to conduct the final examination of name on her thesis entitled " Effects Of Grammarly Application On Esl Students' Construction Of Grammatically Correct Sentences In Essay Writing" in accordance with the Universities and University College Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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LIST OF ABBREVIATIONS

CALL	Computer assisted language learning
CLT	Communicative Language Teaching
ESL	English as Second Language
EFL	English as Foreign Language
ICT	Information and Communication Technology
SDL	Self-Directed Learning
ZPD	Zone of Proximal Development



CHAPTER 1

INTRODUCTION

This chapter introduces the background of the study followed by the statement of problem, research objectives, research questions, significance of the study, research limitations, and the operational definitions of terms.

1.1 Background of Study

English is an international language and is used globally all over the world. In Malaysia particularly, English is considered the second most important language, next to the Malay language or Bahasa Melayu. The Ministry of Education of Malaysia has set English language as a compulsory subject in all primary and secondary schools. The ministry aims to extend learner's English language proficiency in order to meet the students' needs in everyday life and for knowledge acquisition (KPM, 2001). The English language subject, particularly in primary education, aims at providing students with the essential English language skills, namely foundational knowledge in listening, speaking, reading and writing and knowledge of grammar to enable them to communicate in speaking and in writing (KPM, 2005).

In the KSSM, or known as the Standard School Based English Language (2017), emphasis is given on modular in focus approach. This approach ensures that all the language skills, such as Listening, Speaking, reading and Writing and the elements of Grammar and Literature in Action are given due focus and attention. All the 4 language skills are linked through a topic of a selected theme. Grammar is infused during the teaching of these language skills and it also gives emphasis in a separate and specific grammar lesson. This new curriculum is geared towards sustaining the use of English within and beyond classroom. Another focus is the 21st century learning where the lessons and activities are student-centered and more to inquiry based activities. ICT skills which involves interacting with electronic software and courseware is inculcated in this new syllabus.

Also, in the Standard School Based English Language (2017), out of the four English skills, the writing element is given emphasis as it is an essential skill for the students compared to the other three skills which are reading, listening, and speaking. The aspect that is focused most in writing is the ability to construct grammatically correct sentences to profess the student's mastery of the English language particularly in the written format. In this sense, writing, or more specifically constructing grammatically correct sentences in writing, is given the most emphasis in the Malaysian schools because low stakes and high stakes English examinations throughout Malaysia require students to write their responses in the English language with correct grammatical sentences. Success in their high school examinations, particularly in English language subject—and more particularly in the writing section if and whether they are able to write sentences grammatically correctly, due the fact that it carries the most mark in the national

examination—is really important as this success indicates opportunities for entrance into higher education institution and thus better job prospects (Wahidah, 2012).

For instance, students in the upper secondary level need to sit for 2 English papers that is 1119/1 and 1119/2 for Sijil Pelajaran Malaysia (SPM). The main concern of the researcher in this study is the writing paper, 1119/1 which consists of two sections, to which students need to write both papers with correct grammatical sentences to not only show their mastery of English writing, but more importantly their mastery of the English grammar that can be seen through their writing. The first section is guided writing and the second one is continuous writing. The allocation of sections and the marks are shown in Table 1.1

Table 1.1: Allocation of Marks for Writing Sections in SPM English Paper 1 (1119/1)

1119	Sections	Marks
Paper 1	Section A: Guided Writing	35
	Section B: Continuous Writing	50

From Table 1.1, the allocation of marks are clearly shown which is involving the writing paper which is the main focus in this study. Section B of the writing part is Continuous writing which contributes a large proportion for the overall marks. In this part, the types of essays tested are narrative, expository, factual, argumentative and reflective. Students are given 5 options of questions, they need to choose only one from the topic and write for 350 words of length. Nevertheless, this section is scored poorly by the students due to low proficiency and lack of idea generation (Fauzee Selamat, 2002).

Paper 1 from the 1119/1 paper is a reliable indicator whether the students would obtain a higher or lower grade for the overall English paper. Research has shown that narrative discourse is easier to master (Sabariah Md Rashid & Chan, 2008). Students have more experience in narrative writing. According to Malaysian Secondary School English Curriculum (KBSM) already showed that the main discourse for teaching of writing for the first four years of secondary school focuses on narrative and descriptive mode of discourse. As the Form Four students are already trained to answer the sections in the English paper according to SPM standard, students have certain foundation of what is a narrative essay all about. As writing paper, especially continuous writing has a major contribution to the overall grade for English paper, the need to find methods to enhance good writing is essential. More importantly, what is pertinent in both of these writing papers is the students ability to write correct grammatical sentences to show their mastery of not only writing skills, but also mastery of the English grammar and thus the English language per se.

Good grammar knowledge and good writing skills are important for students to excel academically and for career opportunities (Graham & Perin, 2007; Chow, 2007). The lack of success in ESL students' grammar knowledge especially in their writing would spell difficulties for them as they enter the universities. In higher education, the

democratization of universities has allowed English to play a more prominent role in teaching and learning language, in which many undergraduate programs are taught in English. However, students who enter universities are the product of an education system that emphasizes Malay language in its curriculum. Therefore, it is difficult for students to grasp the English language as they attend lectures and tutorials (Wahidah, 2012).

Furthermore, English is an important language in schools or in the universities because these learning institutions prepare them for the employment sectors. A student's mastery of the language not only help them to excel in their studies but also secure them better jobs after graduation as employers prioritize hiring graduates who are competent in English. A study on the Academic Achievements and Employability of Graduates in Institutions of Higher Learning (Morshidi et al., 2004) revealed that English language skills have significant effects on employability. For students to be able to be successful in learning institutions such as schools and universities as well as in work force, it is really important for them to master these writing skills early on—as early as the primary and secondary education level—particularly and preferably with masterful proficiency in the English grammatical knowledge.

In Malaysia, English is accorded as a second language as stated in Article 152 in the Federal Constitution of Malaysia (Nor Hashimah Jalaluddin et al., 2008) and to be part of globalization, it is important that one is equipped with a good command of English in order to make it well in global market. Besides, the ability to write in English and construct grammatical correct writing work is also considered one of the crucial skills required to insure one's employment in the current job market. (Siti Hanim Stapa, Tg. Nor Rizan Mastum & Saadiyah Darus, 2008). As this ability is vital, writing grammatically correct sentences in English plays very important part in students' performance, and it starts from primary till secondary level. One of the purpose and objective of English Language Instruction in Malaysian Education System is to enable the learners to produce and write essays with correct grammatical sentences besides increasing their writing skills in English. Writing in Malaysian schools are being assessed as part of examination of the English paper and a necessity and requirement in furthering education at college and universities.

Writing correct grammatical sentences is one of the tools to directly and indirectly measure the students' proficiency level in second language, particularly in their writing abilities and their grammar knowledge. Writing correct grammatical sentences is especially important for the instruction of second language learners for 3 reasons. First, writing correct grammatical sentences is a vital skill for academic or occupational success (National Commission on Writing, 2004). Second, writing correct grammatical sentences can be an effective tool for the development of academic language proficiency as learners are more readily explore advanced lexical or syntactic expression in their written work (e.g., Warschauer, 1996; Weissberg, 1999). Third, writing correct grammatical sentences across the curriculum can be invaluable for mastering diverse subject matter, as written expression allows learners to raise their awareness of knowledge gaps.

Although English grammar knowledge particularly through writing activities is the most widely taught skill in Malaysian primary and secondary schools (Hassan & Selamat 2002), students still find it difficult to master. Silva (1993) as cited in Brown (2001) finds that students think writing correct grammatical sentences in second language (L2) is trivial. In addition, Silva (1993) demonstrated in a survey of L2 writing that L2 writers were “less fluent, less accurate, did less planning and were less effective in stating goals and objectives” (p. 339).

There is growing concern about the level of English Proficiency in Malaysia, particularly on their grammatical knowledge and their writing proficiency. The 2004 School Certificate Examination Report on English Language 2 revealed that majority of the candidates have yet to master the writing skills in English (Laporan Prestasi SPM, 2004) particularly due to their poor mastery of the English grammar knowledge. In the 2013 English Lab initiative under the Government Transformation Program conducted by the Performance Management and Delivery Unit (PEMANDU) of the Prime Minister’s Department, 1191 secondary schools were identified with Sijil Pelajaran Malaysia (SPM) English failure rates exceeding 23% (New Straits Time, 2015). PEMANDU also cited that English is students’ weakest core subject in national assessments, in which 25% of candidates failed at UPSR, 23% at PT3, 22% at SPM. They also perform poorly in International English examinations with 50% of the candidates failing the 1119 paper due to their poor mastery of the English grammar which could be seen in their poor English writing.

Malaysian candidates also perform badly for the Malaysian University Entrance Test (MUET) where 62% of them achieve only Bands 1 and 2 placing them under the categories of ‘limited user’ and very ‘limited user’ of English, which means that not only their writing skills are poor, but their writings are full of grammatical mistakes which means the grammar knowledge that they used when writing has not been mastered. Data from the Malaysian Examination Board showed almost consistent failure rate for English in the SPM examinations since 2011. In 2011, 23.2% failed, 22.9% in 2012, 20% in 2013 and 22.7% in 2014 (Malaysian Examination Board, 2014). These statistics, among others and the fact that 450,000 candidates sit the SPM annually led to the postponement of making English compulsory pass subject in the exam. It is estimated that 25% of failures will disqualify the students from getting the certs for SPM (Datin Shawal, 2013).

Writing correct grammatical sentences is a basic skill that needs to be mastered by all the students in Malaysian English Language Curriculum (Ministry of education, 2000). Despite learning English for many years, many of these students remain weak in English language, especially writing skills (Rashidah, 2005) and grammar knowledge. Chitravelu, Sithamparam and Teh (2005) pointed out that writing correct grammatical sentences is the skill most Malaysian students are less proficient in and they do not know how to accomplish the written tasks in satisfactory ways, not to mention their writing are full of grammatical mistakes. Various studies have attempted to explain why Malaysian students have continuously been unable to achieve a reasonable English grammar competency level and decent writing skills in English despite learning it for 11 years in schools (Naginder, 2006; Nor Aslah Adzmi, 2009; Jalaludin, Awal & Bakar, 2008; Tan, 2006). Some of these research found that the constraint of the examination-oriented instruction creates problems for the students from becoming effective users of the

English language. For example, Tan (2006), conducted a study on English essay writing among Malaysian school students. She found that, apart from having many grammatical mistakes, their writing performance is only as much as to “meet evaluation criteria”, (Tan, 2006, p. 29) and this causes disinterest and difficulty among the students to learn writing and to display proper grammar knowledge when writing.

In fact, ESL students’ anguish and apprehension towards writing correct grammatical sentences seem to worsen at the university level because a higher level of writing performance is expected of them (Nor Aslah Adzmi 2009). One of the concerns for this problem is that the traditional method of teaching or rather giving feedback on students’ English writing, which would be marking errors in the students’ essays, which does not give much input to students’ learning of writing or use of correct English grammar. According to Chow (2007), traditional grammar and writing instruction remains dominant due to the teachers’ attitude. Writing in the Malaysian classroom remains structural and teacher-centered, and there are no strong efforts in supporting the students learning of English grammar usage apart from just giving feedback on their mistakes without explaining why or how they can improve on their grammatical mistakes in their writing. Semke (1984) in her article “Effects of the Red Pen”, found that the typical heavy mark ups made by teachers were not effective and, in many cases, had a negative effect.

As a second language learner in Malaysia, writing correct grammatical sentences in the English language is one of the toughest tasks to accomplish. Many ESL learners have experienced the difficulty in producing a piece of writing in the English language with correct grammatical sentences. Writing itself is not a simple process and it even becomes a more complicated process when it is learned as a foreign language (Hemabati Ngangbam, 2016), especially in Malaysia. Grammar is regarded as the most fundamental element of language learning for second language learners. In Malaysia, possessing knowledge of grammar is important for learners in all schools for the fact that English is a subject taught in the curriculum. Previous studies have proposed that in written form especially, English as a Second Language (ESL) learners committed common grammatical errors that showed their incompetency in some grammar aspects. As achieving competency in second language is a progressive process, common grammatical errors are continuously dealt by both learners and teachers using various techniques to improve learners’ competencies especially in producing the written form of the language.

In a Malaysian context study done by Annie Gedion, 2016, it indicated that most frequent errors done in the learners’ writing samples was associated with the verbs (18-90%), spelling (11.86%) and sentence fragments (10.56%). The fourth highest ranking error found was the use of punctuation in writing (9.93%). The samples in the study were 50 ESL learners who were currently studying Communicative English course in Semester One in a Politeknik in Sabah. They were expected to produce descriptive essays within 200-250 words.

Under the more traditional way of correcting students' mistakes in punctuation and grammar, teachers characteristically marked errors in a complex and often distant manner (Osternolm, 1986; Zamel, 1985). The large number of written comments made by teachers, often in a technical sort of short hand, tend to confuse students. Grammar is the sound, structure and meaning system of a language (Beverly, 2012). As grammar forms the foundation of the language, students must acquire the basic grammar foundation as they are writing.

Research strongly suggests that the most beneficial way of helping students improve their command of grammar is to use the students' writing as the basic for discussing grammatical concepts. Researchers agree that it is more effective to teach punctuation, sentence variety and usage in the context of writing than to approach the topic by teaching isolated skills (Calkins, 1990; Distefano & Killian, 1984; Harris, 1962). English teachers in Malaysia are concerned with the task of producing learners with high English competence.

A challenging question that exists in Malaysian English teachers is which methods of language teaching can help their students to be more proficient in English grammar so that they can produce correct grammatical sentences their English writing. Some teachers believe that traditional language teaching methods, like Grammar Translation Method and Audio Lingual Method still work well and seem effective for their pedagogical purposes. But some other teachers believe on modern language teaching approaches, like Communicative Language Teaching (CLT) and Task Based English Teaching (TBC) which can help the students more in enhancing their grammar knowledge (Reza, 2010). Another learning approach that is vital is Self-Directed Learning which has very essential ties with the online grammar checker.

Self-Directed Learning or SDL is listed as a key component for the 21st century skills among our Malaysian students particularly. As mentioned, the new KSSM and KSSR curriculum which is to be implemented by the Ministry of Education in 2017 has highlighted students-centeredness in its blueprint, where by teachers are facilitators and students will be responsible for their own learning. SDL is intricately linked with lifelong learning which has been listed as a demand for modern society by International organizations such as UNESCO and OECD (Flint, 2011). According to Gibbons (2002), "Self-Directed Learning is any increase in knowledge, skill, accomplishment, or personal development that an individual selects and brings out by his or her own efforts using any methods in any circumstances at any time" (p. 2). Gibbon stresses the importance of developing ownership of learning as it will motivate a learner to pursue a learning goal and persist in the learning process. This involves challenging activities and developing personal knowledge and skills to pursue the challenges successfully. Thus, this notion of SDL resonates with our new curriculum which puts a great emphasis on students being responsible of what they learn.

The concept of SDL prevails in educational technology as a way of differentiated learning, in which it changes the role of learners and the teacher in the classroom, alters time/place of learning and revolutionizes traditional schooling. New developments in the 21st century education such as online learning opportunities, pedagogical shifts and

availability of Internet on mobile devices have put additional expectations on learners to take more initiative in their own learning. Online grammar checker can promote self-directed learning among the students, especially in helping them learn and understand English grammar better and to be able to write correct grammatical sentences in their English writing. This is where teachers are still present as a guide then gradually shifts away from support to pave way for the learner independence. This is related to scaffolding which was discussed in the notion of Zone of Proximal Development (ZPD) by Vygotsky (1978). Within these concepts of SDL and ZPD, the students would be exploring 'Grammarly' to write correct grammatical sentences and get feedback for their narrative essays. Grammarly creates a path to correct and improvise their essays. The feedback obtained from the online grammar checker will guide the students from committing the same errors in the future and most importantly the students learn grammatical rules indirectly from the grammar checker. Every errors they make will come with explanations in terms of notes and examples of sentences. Students learn at their own pace and they are responsible of they learn, contrast to the traditional classroom. When teachers are explaining grammatical aspects in class, students are mostly listening. When they are doing their work using the grammar checker, they are also learning at the same time correcting their errors.

There are many types of computer software and online services that can aid and help in the teaching and learning of English grammar and writing, such as My Access, E-rater, Microsoft Office and Word 2000. ICT tools, such as the Grammarly grammar checker, have now removed the time and space constraints of class time (Frayer, 1997). Carmen and colleagues (2003) stated that integrating ICT tools in teaching can lead to increased students' learning competencies and increased opportunities for communication. Using computers, such as the Grammarly grammar checker, in developing grammar knowledge and writing skills in second language learners provides a practical introduction to recent developments in grammar learning and writing composition and offers specific guidance to whom wishing to take advantage of them. A number of research studies have emphasized the advantages of computers in writing and all these studies show that technology can positively affect language learning (Nikko & Gorjian, 2012).

English language instruction has changed considerably following the influence of technology in the classroom. Computer technology, more specifically modern information and communication technology (ICT), has been thought to hold great potential for improving second language learning (Chapella, 2001; Egbert et al., 1999). Conventionally, computer technology used in second language acquisition tends to focus on individual language learning tools for example grammar, spelling vocabulary, reading and writing software (Zhao, 2003). However, there are computer-based software used for learning English grammar and writing, such as grammar and spell checkers, used to provide feedback to students' written drafts (Jacobs & Rodgers, 1999). Furthermore, online software are finding its place in educational site due to the many wonders that teachers and students gain from it.

According to Alex Vernon (2000), since commercial word-processing software integrated grammar checkers in the early 1990s, the composition community has scaled back its printed work on this technology to pursue more urgent issues of new technologies (new media, online composition, etc.). With the advent of technology,

students should be exposed to online grammar checkers to enhance their writing particularly to be able to write correct grammatical sentences. William Oates (1987) recognized that grammar checkers can inspire writing, and William Wresch (1989) noted that they attract student interest and have the significant advantage over textbooks and drills in that they offer grammar instruction at its most 'teachable moment', the moment of direct application to student writing (p. 46). Figueredo and Varnhagen (2006) revealed that by using computer students were able to correct grammatical mistakes with the aid of spelling and grammar checkers. A study by Hartley, Sotto, Pennebaker (2003) found out there were significant differences between the average letter length and the number of paragraphs written and the number of sentences used by students who utilized computers and those who did not.

The rapid growth of computer technologies creates a plethora of ways in which technology can be integrated into one of the alternatives to facilitate grammar checking. According to Siti Hanim Stapa, Tengku Nor Rizan Tengku Mohd Maasum, Rosnah Mustaffa and Saadiyah Darus (2008), students should be able to write effectively to meet the standard of the language command by using the correct English grammar. Myles (2002), adds that factors, such as idea development, cohesion, and grammar need to be taken into consideration in essay writing. With the current need to promote educational technology in learning and to promote students learning English grammar and English writing by way of the teacher and by themselves, the study on the effectiveness of grammar checker application (Grammarly) on ESL students' construction of grammatically correct sentences in essay writing is timely and important to be done.

The researcher is of the opinion that all of these objectives that are stated in the Malaysian Education Blueprint 2013-2015, in particular those that aspire to enhance students to have better mastery of English grammar and to attain better writing skills, can be achieved with the use of computer technology, such as the Grammarly grammar checker application. Thus, this study is conducted to study the effectiveness of grammar checker application, specifically the 'Grammarly' application/software, on ESL students' construction of grammatically correct sentences in essay writing and its benefits (if any) to the students and teacher.

1.2 Statement of Problem

In the Malaysian context of learning English, the major difficulty that the students encounter would be writing correct grammatical sentences in their English essays and it has always been the reason why students cannot excel in the examination (Chuo, 2004). The students could score the highest marks in paper 2, 1119/2, which is the reading comprehension section, but not in paper 1119/1 as this paper consist mostly of writing tasks (Surina, 2000) which requires them to write with correct grammatical sentences. Malaysian students' weakness in mastering the English grammar is the fundamental of English writing. According to James (1988), grammatical errors in writing such as tenses, prepositions and weak vocabulary are the most common and frequent type of errors that are committed by learners.

Writing comprises grammatical elements which are vital in constructing sentences. Grammatically correct sentences are essential when the students start writing and this is where our students' are lacking. Malaysian ESL learners usually face difficulties in learning the grammatical aspects, such as subject-verb-agreement, prepositions and correct tenses. Marlyna, Khazriyati and Tan Kim Hua (2005) observed the occurrence of mistakes in subject-verb-agreement and copula 'be'. In subject-verb-agreement, problems occurred when the verb has to be inflected in the present tense to agree with the subject, 46.3% made mistakes on subject-verb-agreement. According to Surina and colleagues (2000), a large number of Malaysian students find subject-verb-agreement problematic in their writing. Even though subject-verb-agreement is one of the first item exposed to students as early as their primary years (Nor Arfah, 1988), students experience difficulties in managing these structures while Munir (1991), finds that subject-verb-agreement is apparently the area in which Malaysian students encounter the most difficulties. This overall scenario prohibits the ESL learners' from producing grammatically correct sentences.

Malaysian students are still weak in English grammar, especially when using correct English grammar in their writing (Carmen, 2003). Lack of English grammar knowledge is the main cause of lots of difficulties that students have their writings tasks. Darus and Subramaniam (2009) investigated the types of errors made by 72 Form Four Malay students in their written work. The results of the study show that errors were basically grammatical. Students had weak vocabulary and committed errors in applying sentence structure rules in English. The study concludes that the students have problems in acquiring grammatical rules in English. In most past researches in analyzing problems of writing in English, the researchers' aims were to identify errors that occurred, analyze the errors to find out the cause and worked out possible solutions for it.

In another study, Lim (1990) analysed grammatical errors made by Malaysian Mandarin speaking students from a community college in Kuala Lumpur. 50 ESL compositions produced in a test were used as main source of data. The researcher used free and guided writing tasks to compare the results. Similar to previous studies, the grammatical errors were classified under eight categories namely tenses, articles, prepositions, spelling, pronouns, wrong choice of words, singular and plural forms and subject-verb-agreement.

Grammar is important in language acquisition and is defined as study or analysis of rules in the language (Huddleston & Geoffrey, 2002). Grammar knowledge is the fundamental foundation for writing (Fearn & Farnan, 2007). In our Malaysian context of writing, the grammatical aspect is where the students had failed to master even being exposed as early as primary level. When the basic English grammar rules are not mastered, once they progress to upper secondary, writing is an uphill task for. Grammar is not something that is necessarily fun or exciting to learn, but learners can only learn to express themselves well using complete sentences (Oldenberg, 2005). The learning of grammar is not just about errors and correctness but to help students to understand how to make meaningful, clear and precise sentences and paragraphs (Haussamen, n.d., p. 1).

Furthermore, all students face a number of complicated problems, which may be either cultural or linguistic ones (Musa, Lie & Azman, 2012). These problem has exist for quite some time and still prevails among our Malaysian students. Thongsongeen (1998) mentioned that cultural and linguistic problems comprises good understanding of the norms and ability to adapt oneself to a different style of learning. Malaysian students are accustomed in learning using Bahasa Melayu all the time and they familiarize themselves in that particular language. When it comes to English, the method of learning is different as grammatical elements are different compared to Malay Language.

To illustrate, in an experimental study done by Razianna (2005), confirmed that by using Bahasa Malaysia in an English class can make learners learn English. In the study, it was found that the learners resorted in explaining incomprehensible or difficult English passage using Bahasa Malaysia and the translation facilitated their comprehension of the English text (Siti Hanim Stapa & Abdul Hameed Abdul Majid, 2006). When this scenario exists in our English lessons, the students would be comfortable using Bahasa Malaysia and use translated language to understand the lesson. This will hinder the mastery of English language because it is different in terms of the grammatical elements. Problems in sentence construction and so forth is because students could not master English grammar compared to Malay Language. Direct translation between these two languages also creates problems in writing because the languages are different in their grammatical rules and applications.

In many instances, negative attitudes towards writing have also been linked to English as a second language (ESL) students' poor performance in writing correct grammatical sentences. Students are also found to be careless and they dislike writing activity (Saadiyah Darus, 2012). The findings also revealed that students' problems on writing stemmed from lack of practice, lack of time being allocated in class, dull writing activities and lack of critical thinking in their writing, all of which affected their writing quality. One of the reasons why students dislike writing especially in English is because of the lack of knowledge on the grammatical elements, which are the foundation of a language. When students have problems in understanding simple subject-verb-agreement and tenses, they would not be able to write because to express their ideas they need the language. Poor and limited vocabulary also leads to the problem where the students are reluctant to write. There is a disparity between writing and the second language of English as a second language/English as a foreign language (ESL/EFL) students. According to Leki (1992), ESL/EFL students are also disappointed with difficulties in understanding word implication and meaning, which are very important aspects in writing.

A review of the related studies in English language learning in Malaysian schools context indicates that the first language, Bahasa Malaysia, interferes considerably with the second language learning. For instance, Maros, Hua, and Khazriayati (2007) (as cited in Musa, Lie & Azman, 2012) who examined students' language learning problems, reported that Bahasa Malaysia interference is a hindrance in the English literacy achievement among secondary school students. The error analyses and contrastive analyses in their study reported all types of grammatical errors among 120 students in three parts of Malaysia. They claimed that Malaysian students were not able to use the correct forms of grammar. Studies by Hamidah, Melor and Nor Zaini (2002), Noreiny

Maarof and colleagues (2003) and Hazita Azman (2006) indicate that the students' weakness in English can be attributed to attitude, geographical location and ethnic.

There are also studies that focus on structural differences between Malay and English language. The structural differences especially in terms of morphology interferes in the learning of English language and hence the acquisition of the language itself. Nor Hasimah, Norsimah and Kesumawati (2008) conducted a study on morphology and syntactical aspect of both Malay and English. The samples were 315 Form 2 students from Johor which involved rural, sub-urban and urban schools. A thorough examination of morphological and syntactical differences between the Malay and English language has been shown to be one of the major factors in students' inability to successfully acquire the English language, to successfully understand and apply their existing knowledge of English grammatical structure.

Research on writing has traditionally explored how students felt about and performed with word-processors. Daiute's (1985) work entitled "Writing and Computers" set the stage for much of what the teachers did with teaching writing in the classroom in the language arts as well as in foreign language teaching. Studies by Neu and Scarcella (1991) and Phinney (1991) found that students had positive attitudes towards writing with computers and less apprehension about writing, respectively. Thaikpakdee (1992) found better attitudes toward writing and computers corresponded with better writing, which is less grammatical mistakes and improvement in the grammatically correct use of the written English language. Chen (1997) points out an interesting result in her study on the use of a grammar checker specifically designed to help Taiwanese students with their writing and grammar knowledge. She found that students who got computerized error feedback did more editing on their grammar mistakes and improved their writing; but those who received more detailed and personalized feedback improved their writing more than those who received only generalized feedback.

Research in the area of Computer assisted Language Learning (Bakar, Gearheart & Herman, 1994) has shown that teachers often regard the use of computers in classroom positively mainly because computers provide a means of interactive and they offer novel ways to present instructional materials using more interesting and efficient ways like word processors, spread sheets and database. Implementation of computer in the language classroom will enable teachers to spend more time individually with their learners' special needs (David, 1991). Technology can enhance teaching and learning (Dwyer, Ringstaff & Sandholtz, 1991) and minimize the need for the teacher's constant directions that paves the way for more individualized instruction. The related literature of technology in classrooms was greatly argued by Schmidt (2008). Computers are claimed to reduce interaction and eye contact between teachers and students. However, these problems can be avoided by using the right form of technology for a given learning-teaching context. In the Malaysian context of English lesson, especially in writing, technology can emerge as a great help as the methods used so far does not give any great impact to them. Students, especially in secondary level are exposed to technology and they would be eager to use it during classes. In this view, the grammar checker will be a good choice as the online application will be appealing to the students compared to chalk and talk method in writing. In this view, learners may find it less difficult to master

grammar if they learn through discovery from the use of technology rather than drill-and-practice (Eloia, 1987).

However, the use of technology in education should always be approached with caution. To illustrate, in Malaysia, in an attempt to integrate technology into teaching and learning of English in schools, the English language teaching courseware was developed in 2003. It included a package of compact disks which consist of several units each has been divided into a number of lessons. Such courseware however, has been criticized by some researchers. For example, Mukundan (2008) warns that the screen-by-screen approach of the courseware gives impression to the learner that she is sitting a lecture rather than taking an English lesson. Be that as it may, educational software may help language learners because they have proved useful for students from content-based subjects and the emphasis was given for listening (Aini Arifah & Norizan, 2008).

In this view and in relation to using technology and online services in teaching English grammar and applying the correct grammar in English writing, there is a need for educational software that can aid our students in writing as this component is far tougher and vital to them. Educational software, such as grammar checker, is one of the most important tools in computer-aided education, especially in teaching writing with correct grammatical sentences. Grammar checkers are “software prepared in computer environment and intended for shortening the teaching process making the topic more visual and audible by taking advantage of computer environment in teaching a certain topic or problem” (Kazu & Yavuzalp, 2008, p. 113). They enable children to control the learning process and through exploration construct concepts and knowledge (Haugland & Ruiz, 2002). These software can open a new horizon of writing thus might be the stepping stone for the improvement of grammar knowledge and in students’ writing.

This has encouraged the researcher to carry out this study, particularly on the use of grammar checker, i.e., Grammarly, and effects of Grammarly application on ESL students’ construction of grammatically correct sentences in students’ essay writing. As narrative essay is something familiar to the Form Four students, the researcher used narrative essay to carry out the study. For SPM 1119/1 paper which comprises of writing, the narrative writing comes under Continuous writing which contributes the majority of the marks for the paper which is 50 marks. If the students are trained and guided to answer this mode of writing, it can help them to score better grades for their English paper. According to Koo (2010) many students seem to lack of confidence in writing. One of the problems that can be seen in the students’ essays is the lack of ideas (Sharifah Nor Puteh et al., 2010). For the students with low proficiency of English, their essay length tend to be problematic. All this goes back to the grammatical aspect, which is the main concern of this research, in which the less the students know or master the English grammar, the less they write for fear of making grammatical mistakes that might affect their writing grades. As writing needs enhancement with the strengthening of students’ grammatical aspect, the researcher believes that the online grammar checker can come into the picture to help alleviate this concern.

With the enhancement that the students would gain from the online grammar checker to further understand the errors in grammatical aspect, narrative writing could be enhanced as well. Among the five options of questions offered in continuous writing section, narrative is a straight forward question where students are free to voice out their thoughts and imagination also plays a vital role in this type of writing. If the students are guided on the right path from the early stage, they can write better narrative essays with correct grammatical sentences for the real examinations.

1.3 Research Objective

1.3.1 General Objective

The general objective of this quasi experimental study is to determine the effects of Grammarly application in ESL students' construction of grammatically correct sentences in their essay writing.

1.3.2 Specific Objectives

The specific objectives of this study are as following:

- a) To identify which aspects of grammar (i.e., subject-verb agreement, sentence structure, punctuation, and spelling) that the secondary schools students have most problems with in writing essays.
- b) To determine effects of using a grammar checker software, i.e., Grammarly, in constructing grammatically correct sentences in essay writing.
- c) To determine which aspects of ESL students' grammar knowledge (i.e., subject-verb agreement, sentence structure, punctuation, and spelling) that are most influenced by the use of a grammar checker software, i.e., Grammarly.

1.4 Research Questions

There are three research questions in guiding this research:

- a) What are the aspects of writing grammar (i.e., subject-verb agreement, sentence structure, punctuation, and spelling) that the secondary schools students have most problems with in writing essays?
- b) What are the effects of using a grammar checker software, i.e., Grammarly, in constructing grammatically correct sentences in essay writing?
- c) Which aspects of ESL students' grammar knowledge (i.e., subject-verb agreement, sentence structure, punctuation, and spelling) are most influenced by the use of a grammar checker software, i.e., Grammarly?

1.5 Significance of Study

Writing is a major part of English language, and the main attribute to successful writing come from mastery of the English grammar. Helpful educational software that can help writing, such as the grammar checker, should be exposed to both the students as learners and to the teachers as educators (Alex Vernon, 2000). The exploration of technology would spark great benefits in the mastery of the English Language grammar knowledge and writing skills. Through the use of current educational technology, such as grammar checker, it would enhance the grammar knowledge and writing skills of students. Students will gain more guidance and be more motivated in writing correct grammatical sentences when they check their writing using the grammar checker software. As secondary school students would be progressing to higher level of writing, the grammar checkers would be a great aid for them, especially to help them in their learning of English grammar and developing their writing skills.

Computer and technology usage through the usage of grammar checker can also promote learner-centered language learning style and self-directed learning style as the teacher will be present as a facilitator and not solely as the provider. The national curriculum assigned by Ministry of Education has great emphasis on the self-learning method being applied to secondary schools students (KSSM, 2017), and the use of educational software like the Grammarly grammar checker can be seen as one of the ways to achieve this aspiration.

In addition, the use of grammar checker software, like Grammarly, which promotes self-directed learning will ease the burden of the educators especially in marking essays and teaching grammar. Marking essays has never been an easy task for the teachers especially with a large enrolment of students (Darus, 2012). Evaluating and grading essays is often a huge task to the teachers, and giving timely and pedagogical feedback is a challenge in many writing classrooms (Tan, 2006). With the advent of information and communication technology (ICT), intelligent machine or software that could reduce their marking load (Whittington & Hunt, 1999; Williams, 2001) can find the solution to their problems in the form of Grammar checkers that can save time and at the same time promote students' self-learning of the English grammar and writing skills to occur without too much dependence on the teachers. On the other hand, teachers can also allocate more time to diversify their methods of teaching using the grammar checkers for different level of students (Nadzrah, 2010). For material developers, the use of educational technology, such as the Grammarly grammar checker would cut down expenses in printing too many activity books as they can use the grammar checkers as a base to develop more creative grammar and writing activities. Grammar checkers are not free, but once they are installed, the usage is for a long duration and could be utilized by many students.

1.6 Research Limitations

Limitations in research are usually areas over which the researcher has no control in the research. Some limitations in research are sample size (e.g., too small a sample size that is not enough for generalization), methodology constraints (e.g., focus of certain research methodology that might not answer other research questions that might arise from research), length of study (e.g., whether or not the time spent in planning, collecting and analyzing data is enough for validity and reliability of research) and response rate from participants or samples of research (Roberts, 2007). As for this research, the researcher did encounter some limitations in terms of the length of the research, in which the researcher took a month to gather the data. In view of the quasi experimental research design, this amount of time might not be sufficient to get a clearer picture of the usage of Grammarly. Research in such a nature should be done in longer duration to obtain a more solid data. In overcoming this obstacle, the researcher managed to organize the time allocated for the study by creating a schedule of what was to be done on the particular week. The researcher also was alert with the school's programs and conducted the study in the constraint time. Most importantly, the duration for both groups could somehow be fulfilled and the results obtained were satisfying.

Secondly, the samples are limited to science stream as these are the only students who were allowed by the school to be involved in the study. In future, students from different courses should be included to get a clearer picture of the benefit of Grammarly. Furthermore, the samples chosen were the based on non –equivalent design whereby the samples were chosen based on the similarities of age, gender, course and most importantly they were of the same level of language. The students in both classes had similar level of language achievement based on the results of their previous examination. In this regard, the PT3 results for writing component for both classes were analysed first before the sampling procedure was done.

This research was conducted in a school in the District of Hulu Langat involving 2 Form 4 classes. The researcher has asked and has been informed by the school administrators and the teachers that the students and the teachers have never used this online grammar checker before this study was conducted. One of the limitations of conducting the research in this particular school is that the bad internet connection in the schools posed some problems. It is a common phenomenon in schools where the internet connections would face interruption. Since Grammarly is an online software, it depends on the internet connection. In order to limit the issues especially in terms of the internet connection, the usage of Grammarly were done after school hours. The lessons involving Grammarly were done in the school computer lab. The computer lab comprised over 30 computers which were important for the samples to use them in this study. The study was scheduled to be done after school as the use of the school wifi was minimal at that hour and Grammarly could be assessed faster. The researcher did try using the school wifi during school hours, and the connection was very poor as many online systems were used in school during the schooling hours itself. The choice of doing the treatment after school hours is to ensure there are no interferences in using the internet because after schooling hours not many usage involving the internet will be done by the students or by the teachers in the school.

The design of the research itself, the non-equivalent group has limitations where by the students were grouped non-randomly. However, measures were taken to ensure the validity and reliability of the research in which the samples were matched according to the age group and based on their PT3 writing results. In doing so, firstly, the researcher asked the students from the both classes to list down their PT3 Writing component results. From the list, the students were from the same level which is equally about the same distribution levels of English proficiency. Each class had only one student each with an 'A' the rest were more to grade C and D. Eventually, random sampling could be applied in the future as it would give a more adequate generalization of the population. The number of samples should be bigger so that the results obtained at the end would comprise a larger population of students. But in reality, experimental designs are not suitable for all studies. For example, in schools, researchers cannot exactly get the samples as they planned as schools have policy on the allocation of the samples to be involved in research purpose. In this case, quasi-experimental is suitable as the researcher used the existing two science classes which were the intact groups. The important condition for the treatment effect to be valid is that the treated and control subjects need to be similar on characteristics related to the treatment assignment and the outcome variable (Shadish, 2002). This was abided by the researcher whereby the two groups did share the similar characteristics and they were not exposed to any online grammar checkers before in their writing classes.

Lastly, the pre-test and post-test marking was done by the researcher, perhaps certain degree of subjectivity might be found. However, it is important to note that the researcher is an experienced SPM 1119/1 paper examiner for the past 6 years. So the requirement and the grading were scrutinized and followed accurately while marking. Most importantly, the samples were not familiar to the researcher, as such the researcher made sure that there was no biasness in grading the students. In future, more teachers or SPM examiners could also be added to increase the objectivity of the findings.

1.7 Operational definitions of terms

1.7.1 Zone of Proximal Development

According to Vygotsky (1978), zone of proximal development is the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. The ZPD is the area between a learner's level of independent performance (often called developmental level) and the level of assisted performance-what the child can do with support. The ZPD construct is a shorthand device capturing the emergence of cognitive development within social interaction when participants are provided assistance from more-competent others (teachers and peers) as they engage in learning activity. In this study, the term ZPD that the researcher operationalizes for this research refers to the initial stage that the students were before they were exposed to the intervention. The students' could write, but they were still weak in constructing grammatically correct sentences in their essay writing. From the stage of what they could initially do, the students moved on to the ZPD zone where now the students were aided with the online grammar checker that is Grammarly.

1.7.2 Scaffolding

Scaffolding learning defined as the mediator's adjusting the complexity and the maturity of the teaching interaction to facilitate the [learner's] mastery of the task; providing support when necessary; and providing encouragement and prompts to the [learner] to move ahead when ready (Lidz, p. 80). Scaffolding is a process through which a teacher or more competent peer helps the student in his or her ZPD as necessary, and tapers off this aid as it becomes unnecessary (Wood et al., 1976). Vygotsky's (1978) Zone of Proximal development can be related to the grammar checker in learning about English writing. Students in the schools, have basic skills of writing but needed extra coaching in terms of constructing sentences. In this study, the term scaffolding refers to the students' ability to write essays but perhaps with not proper grammatical sentences especially involving the grammatical aspects. This means scaffolding is needed from 'more knowledgeable other' to succeed in writing narrative writing. This more knowledgeable other is usually the teachers and peers and in this research, the online grammar checker is acknowledged as the more knowledgeable aspect

1.7.3 Self-Directed-Learning

Knowles (1974) described Self-Directed Learning as a process in which individuals take the initiative without the help of others in diagnosing their learning needs, formulating goals, identifying human and material resources and evaluating learning outcomes. Self-directed-learning or SDL is based on several fundamental concepts. Firstly, all individuals have the capacity to engage and develop SDL skills. Secondly, learners can and should take greater control over the learning skills. Third, SDL habits are transferable from one activity to another. Therefore teachers' role is to assist the students develop SDL skills by providing direction and support based on the needs of the students and the activity involved. In this study, the term SDL that the researcher operationalizes for this research refers to the aspect of discovery learning by the students. The students were actually mastering the grammatical elements in writing by discovering by their own on why the errors were made in their essays. The explanation given by the grammar checker with the examples were actually motivating the self-directed learning.

1.7.4 Narrative Essay

A narrative essay is a text or a piece of writing that students' creatively compose either independently, in a group or with the help of a teacher, in response to a writing exercise or task. As narrative essay is something familiar to the Form Four students (i.e., sample of the study), because for the PT3 examination paper SPM 1119/1 examination paper which comprises of writing, the narrative writing comes under 'Continuous Writing' section which contributes the majority of the marks for the English paper, which is 50 marks. In this study, the term narrative essay that the researcher operationalizes for this research refers to the narrative essay tasks and questions that were taught at secondary schools in Malaysia, and particularly the narrative writing tasks which are based on the narrative essay questions that were asked in the past SPM examinations (i.e., SPM 2015

and SPM 2016). In this study, the narrative essay is used as the dependent variable in the study, to which the results in the students' pre- and post-tests on narrative essays were recorded, evaluated and analysed particularly in regards to the students' ability to write correct grammatical sentences on the grammatical aspects of subject-verb agreement, sentence structure, spelling, and punctuation.

1.7.5 Grammar Checker

Grammar checkers is just one category of a range of technological tools that are available for people using computers for writing. They can detect errors in the mechanics of writing, grammar and the style of writing. Grammar and spell checkers are categorized as software that can aid writing among the students (Robinson, 1996). The face-to-face interaction and the online feedback obtained by the students can help them especially in sentence construction when writing essays (O'Hare, 1973). In this research, the grammar checker that is used for the study is called the Grammarly spell-checker which is an English language writing-enhancement online platform developed by Grammarly, Inc., and launched in 2009. Grammarly's proofreading and plagiarism-detection resources check more than 250 grammar rules. In the study, the effectiveness of the online grammar checker, 'Grammarly' are measured via pre and post -test which involves students' grammatical knowledge in their narrative writing. In this study, the grammar checker is used as the intervention in the study, to which the grammar checker was used as treatment during the study to determine and differentiate the results in the students' pre- and post-tests on narrative essays will be recorded, evaluated and analysed particularly in regards to the students' ability to write correct grammatical sentences on the grammatical aspects of subject-verb agreement, sentence structure, spelling, and punctuation.

1.7.6 Subject-Verb Agreement

According to the Cambridge Dictionary (2013), subject-verb-agreement is defined as the person and number of the subject of the clause that determine the person and number of the verb of the clause. It is one of the independent variable used by the researcher in this study. In this study, the grammar element of subject-verb agreement is used as one of the four the independent variables in the study, to which the results in the students' pre- and post-tests on narrative essays (particularly on their uses of subject-verb agreement) were recorded, evaluated and analysed particularly in regards to the students' ability to write correct grammatical sentences using this particular grammatical aspect when engaging in the pre-test, post-test and writing exercises in the study.

1.7.7 Sentence Structure

According to the Cambridge Dictionary (2015), sentence structure is defined as the grammatical arrangement of words in sentences. In this study, the grammar element of sentence structure is used as one of the four the independent variables in the study, to which the results in the students' pre- and post-tests on narrative essays (particularly on

their uses of sentence structure) were recorded, evaluated and analysed particularly in regards to the students' ability to write correct grammatical sentences using this particular grammatical aspect when engaging in the pre-test, post-test and writing exercises in the study.

1.7.8 Spelling

Spelling is a language sub-skill under writing (Esther, 2015). It is such an essential skill of writing that has to be mastered by all the learners and for the purpose of good communication. In this study, the grammar element of spelling is used as one of the four the independent variables in the study, to which the results in the students' pre- and post-tests on narrative essays (particularly on their uses of spelling) were recorded, evaluated and analysed particularly in regards to the students' ability to write correct grammatical sentences using this particular grammatical aspect when engaging in the pre-test, post-test and writing exercises in the study.

1.7.9 Punctuation

According to the Cambridge Dictionary (2015), punctuation is defined as consisting of both rules and convention. This includes common punctuation marks. In this study, the grammar element of punctuation is used as one of the four the independent variables in the study, to which the results in the students' pre- and post-tests on narrative essays (particularly on their uses of punctuation) were recorded, evaluated and analysed particularly in regards to the students' ability to write correct grammatical sentences using this particular grammatical aspect when engaging in the pre-test, post-test and writing exercises in the study.

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PUBLICATION

Kalpana Jayavalan & Abu Bakar Razali. (2018) Effectiveness of Online Grammar Checker to Improve Secondary Students' English Narrative Essay Writing. International Research Journal of Education and (IRJES), 2(1), 1-6

