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Using concordancing and word processing to improve EFL graduate students' written English

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*This study aims to investigate the effect of using concordances and word processors on **EFL** graduates' performance in academic writing. To achieve this aim, the subjects were asked to use linguistics corpora and word processors to correct their grammatical and spelling mistakes in their written papers in a course that lasted for sixteen weeks. The sample of the study consisted of 48 **MA** students. Quantitative and qualitative measures were used to gain possible results of the effect of using concordances and word processors on the learners' achievement and performance in writing. Ratio gain relations were estimated, too. To find the participants' achievement, pre- and post-tests were used; semi-interviews and answers to a questionnaire were also analyzed to investigate their attitude toward using concordances and word processors in writing. The findings indicated that their performance improved due to the effect of using concordances; however, spelling and grammar word processor had a slighter effect on their achievement. Recommendations were included for further research.*

Introduction

Theoretical background

The emergence of technology has solved many linguistic problems of students, teachers, translators, and linguists. With the help of computers, it has become possible for them to correct grammatical and spelling mistakes, calculate and compare the frequency of words in different registers, detect word collocations, and analyze and translate written texts easily but not accurately. Focus on corpus linguistics studies

for educational application has been urged parallel to technological innovations. In writing, for example, using the computer for academic purposes can take over most of the work of correcting grammar and spelling, freeing learners to concentrate on some other parts of the task they are working on. Special writing tools can also help in developing the writing processes, such as idea generators, spelling checkers, and sentence completion models. Krieger (2003) in his article "What is Corpus Linguistics?" points out, "One specific area on the computer frontier which still remains quite open to exploration is corpus linguistics" (p.1). He is very interested in investigating more corpus studies that may offer the English language teacher a feasible solution to implement to improve students' writing.

It is claimed (e.g., see Aijmer, 2009; Aston, 2000; Chambers, 2005; Chambers, 2007; Johansson, 2009; Johns, 2002) that there is a dearth of empirical research in the field of data-driven learning (**DDL**), especially outside the restricted environment of higher education. Hence, the researchers' concern is now geared towards concordances and **DDL**, and the use to which these concordances are put in the learning and teaching context. A number of studies have attempted to evaluate some aspects of this **DDL** approach. In a survey of 20 such research projects, Boulton (2010) finds that the results are generally encouraging, but rarely overwhelmingly positive. Hunston (2002) and Sinclair (2004) ascertain that for a variety of reasons, corpus-based pedagogical materials are not widely available or used by teachers and learners in either **ESL** or **EFL** contexts. Partially because of the scarcity of materials, teachers are often unaware of how to effectively incorporate the benefits of corpus-based concordances into their instructional modules.

Meanwhile, the wide use of computer corpora does not mean that it is an ideal tool for use without difficulties or constraints. Some researchers were concerned with the difficulties users face. Granath (1998) concludes that a number of investigations in which corpora and concordances were used in teaching reported that students found it difficult to work with concordances. Boulton (2009) indicates that lower intermediate learners obtained higher mean scores with key words in contexts than with full sentence contexts. Learners interacting with the corpora directly on computers sometimes claim it is frustrating (Farr, 2008), as they have difficulty thinking of appropriate questions, formulating them appropriately, choosing relevant corpora, interpreting the results, and refining their queries with subsequent searches (Kennedy & Miceli, 2001). Therefore, the present study intends to find out if using concordances for a range of purposes such as correcting spelling and grammatical errors is helpful for overcoming graduate **EFL** learners' linguistic problems. This may gear the learning situation towards being more learner-centered than teacher-centered. Brown (2005) confirms that corpus studies have probably had an even bigger influence on language teaching, of which the most important is that the learners are nowadays encouraged to make use of corpora on their own, in order to increase their language awareness.

Computer corpora and word processors

Computer corpora coupled with software, hardware and lexicographic software have turned learning into an awesome and attractive process. The first computer corpus consisted of a million words, and the latest projects are certainly more ambitious. The British National Corpus, for instance, contains a 100-million-word sample of modem English, and the Cobuild project has 211 million words of text. "It has no final extent because, like the language itself, it keeps on developing" (Sinclair, 1991, p. 25). Francis (1992) describes "a linguistic corpus

as a collection of texts assumed to be representative of a given language, dialect, or other subset of a language, to be used for linguistic analyses" (p. 17). Conrad (2000) asserts that "it is the empirical study of language relying on computer-assisted techniques to analyze large, principled databases of naturally occurring language" (p. 548). Aarts (1991) demonstrates that the corpus has double functions; namely, serving as a database for linguistics studies related to the corpus language structure, and 2) using it in corpus linguistics to test hypotheses about the language expressed in correct grammar.

Bowker (1999) argues that very few studies have actually added anything to using corpora in learning. In another study focusing at the development of learner concordance studies, Cobb (1997) points out that second language concordancing is an area which is under-researched. There is a lack of substantial information about any learners' ability to learn from concordancers, intermediate learners' ability to benefit from task description or interface adjustment, and advanced learners' ability to use concordancers. However, Hunston (2002) reports that corpora and concordances have become a main topic in applied linguistics and language teaching.

The Spell Checker-net, on the other hand, is a program which one does not need to download. Several researchers have indicated major applications for the word processor in writing and improving learning English (see, for example, AbuSeileek, 2006; Brierley & Kemble, 1991; Hinkle, 2004). One can check his/her grammar and spelling in different languages online. Another advantage of using this checker is the built-in thesaurus which the user can readily use when he/she is at a loss for the word in mind. Spelling and punctuation correctors are in fact a "personal" proofreading and writing tool. English writing is a powerful tool; if used properly, it will enable users to achieve many of their goals whether for personal or business purposes. A punctuation and spelling corrector automatically proofreads writing for basic grammar, punctuation, and spelling errors. These are some benefits of computer tools which are always being updated. Actually, these tools are bringing handy and easy solutions that help in improving English writing.

Literature review

The effectiveness of the use of corpora and concordances in language teaching has also been proven by research (see, for example, Breyera, 2009; Cobb, 1999; Hunston, 2002; Koosha & Jafarpour, 2006;; Varleya, 2009; Weber, 2001). Research about the effect of using concordances has focused on different issues. For example, Al-Lawati (2011) reports on a study which investigated the learning strategies used and observations made by **EFL** students while working on concordance-based grammar activities. The results showed that observing the concordance data involved the use of combinations of learning strategies, which mostly included four learning strategies: association/elaboration, deductive reasoning, paying selective attention, and using linguistic clues. The results also showed that the strategy of monitoring was a major strategy used when revising the observations made against concordance data. Other studies focused on motivation to learn using concordances. For example, Rapti (2010) investigated the effect of using concordances in the classroom on a group of students in Greece, seeking to examine the degree of motivation in grammar learning when they were involved in **DDL** and the impact of **DDL** in grammar learning and teaching. The qualitative results from interviews and questionnaires showed that most learners admitted the potential and contribution of corpora. However, the degree of motivation in grammar studying varied. The majority of the participants also preferred learning using

concordances, rather than regular instruction. They said that they liked to access corpora along with using a conventional grammar textbook. The qualitative analysis was based on post-test performances of the two groups. It showed that most students in the experimental group outperformed their peers in the control group in each post-test. These findings suggested that there are important gains in corpus-based grammar learning, and they represented a major step toward the development of corpus-based teaching for **EFL** learners.

Other studies are concerned with learner-centeredness and error-correction. Lee and Swales (2006) described an experimental corpus-based course where non-native English students were required to compare between their writing and between their own writing and those of more established writers in their field. They adopted the "decentering" corpus-based approach because it allowed participants to make discoveries and consult texts which were written by different authors instead of depending exclusively on a single writer. Using the "decentering" approach, students could answer their language questions without receiving help from a native speaker. Research shows that the integration of corpus-based studies into teacher training is a very important development initiative that is beginning to emerge (e.g., Amador Moreno, Chambers, & O'Riordan, 2006; Davies & Russell-Pinson, 2004; Wilson & McEnery, 1994). Gabrielatos (2005) is convinced of the potential importance of concordances in language teaching. He also outlined the changes in knowledge, skills and attitudes that are needed for learners and teachers to take advantage of the opportunities offered by the availability of concordances. He reported that concordances are proving increasingly influential in language teaching as sources of language descriptions and pedagogical materials. Other studies reveal that there is a positive tendency towards using concordancing in teaching and learning grammar. Hegelheimer (2006) examined the effect of using an online grammar resource to enhance advanced learners' performance in writing. He investigated the participants' use of concordancing by means of interviews, questionnaires, writing samples, and records of use. Results revealed that the learners could use the resource and considered it functional for lessening their writing errors. Moreover, Changa and Suna (2009) and Gaoa (2011) found that there was significant improvement in students' proofreading performance with the support of a concordancer. Finally, the bilingual collocation concordance, **TANGO**, was considered a useful tool for learning synonyms and their collocations (Yeha, Lioua & Lia, 2007).

On the other hand, there are a number of problems related to the methodology of using corpora in language learning and teaching (Mishan, 2004; Tribble, 1997 and Widdowson, 2003). Some of them are related to using corpora as a resource in learning and teaching. Though corpora may provide authentic and motivating materials, Widdowson (2003) argues that there is a difference between the communicative and interactive nature of language learning and the textual and discourse nature of corpora. Corpora contain records of texts of different discourse situations and their recontextualization. This is very important in pedagogy and needs pedagogical mediation. However, some of the corpus-based tools do not meet pedagogical purposes, and they were created just as linguistic tools. A study by Sun (2000) examined Taiwanese **EFL** students' feedback on web-based concordancing by using a questionnaire approach. The students also expressed concern about the slow speed of Internet connections and the time involved in conducting an analysis of concordance data. Qualitative data obtained through open-ended questions likewise showed that students perceived data analysis of concordance output as problematic due to the huge amount of data available and difficulties in adjusting to the inductive learning style fostered by corpus pedagogy.

Teachers usually correct their students' works which are written for the teacher, not for themselves. Language teachers mostly focus on correcting spelling and grammar errors as they want their students to completely avoid them, which may enhance their linguistic development. However, the view of writing has now changed. Students' awareness is now geared towards other areas, as correcting spelling and grammar has been solved via using computer checkers. Research in computer-assisted language learning illustrates a multi-faceted picture in terms of the effectiveness of technology in various aspects of language learning like writing, vocabulary, and grammar. Chien and Liou (2008) claim that a few studies have targeted academic writing related to technology-enhanced language-teaching, of which one example is the genre of research articles.

Many studies have investigated learners' attitudes toward computer-assisted language learning (**CALL**) and word processors and have reported that they are useful for **EFL** learners, especially in writing (Greenfield, 2003; Warden 1995; Warschauer, 1996). Research has investigated the effectiveness of word processors on developing learners' language abilities, especially writing. For example, AbuSeileek (2006) investigated the effect of using word processors on **EFL** learners' writing performance. Results showed that the word processor was a functional method in teaching/learning writing. Students in the treatment condition who studied writing via word processors significantly outperformed the control group which studied using regular instruction. The findings of the study also revealed that participants in the treatment condition had a positive attitude towards using computer in writing. Moreover, Stevens (1999) recommended using the computer-based method in learning / teaching writing. He argues that the word processor is a very helpful tool that may develop students' writing performance. Cunningham (2000) also studied the usefulness of the word processor for language learners. He reported that students found studying writing via computer to be comfortable and challenging. The participants think that the word processor is supportive for them in improving their writing performance. They also said that word processing helped them in focusing their attention on certain features of their writing, including grammatical rules, organization, and word choice. The results reported by Cunningham revealed that the word processor contributed to improving their writing abilities through increasing their willingness to revise and write, and exchanging ideas with others. Finally, Adair-Hauck, Willingham-McLain, and Youngs (1999) found that the word processor is more useful for learning and teaching writing than the traditional method.

The review of research literature has shown that there is a dearth of studies related to the effectiveness of using concordances and word processors for developing the learners' writing and investigating participants' attitudes toward the benefits of these tools. It also seems that there are no studies which have compared the effectiveness of concordances and word processors, especially their effects on developing graduate **EFL** learners' performance in different writing aspects. This area is underreported, and the present study attempts to bridge this gap.

This study

Purposes and research questions

Using concordances in writing English is expected to serve three main goals: It supports a learner-centered classroom without diminishing the role of the instructor. Secondly, it

encourages the learner's autonomy with regard to error correction by using concordances in the EFL classroom; and finally, it exposes the language learner to analyzing authentic written texts instead of reading fabricated EFL ones. In order to investigate the effectiveness of using concordances on graduate students' performance in writing English, this study attempts to answer the following four research questions:

1. Are there any significant differences between the two experimental groups (concordance and word processor) and the control group on EFL students' overall performance in academic writing at the graduate student level?
2. Are there any significant differences between the two experimental groups due to effect of technique (concordance vs. word processor) on EFL students' overall performance in academic writing at the graduate student level?
3. Are there any significant differences between the treatment conditions on EFL students' performance in aspects of academic writing at the graduate student level?
4. What are students' perceptions towards the use of concordances and word processors regarding their EFL writing aspects?

Participants and study design

The participants were 48 MA EFL students enrolled in a language course in the Department of Curricula and Instruction in the Faculty of Educational Sciences at Al al-Bayt University. They all came from similar public schools and obtained their BAs from Jordanian universities. They all have almost the same academic background. There were 36 females and 12 males. However, the groups were balanced in their composition. They were assigned randomly into three groups: concordance, word processor and control. Each group consisted of 16 students, 12 females and 4 males. As a prerequisite for entry into the MA program, each of them had to succeed in the TOEFL test with an average of 450–500, which shows that they were equivalent in their pre-test linguistic proficiency. The pre-test showed there were no significant differences between the participants in all treatment conditions in the overall mean scores and all academic writing activities (see Table 1). For the purposes of this study, they were trained to use a free online concordance in their class. Besides, they were asked to keep in touch with their instructor via e-mail to get guidance in doing tasks and activities using concordances, especially when it was difficult for them to attend some classes. All of them did more practice and sent reports and summaries to their instructor via e-mail for feedback. They were happy to receive comments on their performance.

Instruments

A test was designed by the researchers to find out the subjects' achievement in academic writing. The test aimed at measuring participants' performance in eight academic writing aspects, including grammar, synonym use, preposition choice, word collocations, word connotations, phraseology, spelling, and writing. The test consisted of eight questions about these aspects marked out of eighty. Ten points were allocated for each question. Each of the first seven questions included 10 sub-questions; five were recognition multiple-choice questions where the student was required to choose the correct answer; the other five were to measure production where each student was required to identify the error and correct it. Half a point was given for each item. However, the eighth question (writing an essay) asked the students to write an essay of 200–250 words about the benefits of the course. The

Table 1: Means and standard deviations of the student's scores on the pre-test in academic writing aspects

Writing Aspects	Group	N	Mean	Std. Deviation	*F*	Sig.
Grammar	Concordance	16	4.20	0.84	2.25	0.15
	Word processor	16	4.20	1.30		
	Control	16	5.40	0.89		
	Total	48	4.60	1.12		
Synonym use	Concordance	16	4.20	0.84	0.86	0.45
	Word processor	16	4.20	0.84		
	Control	16	4.80	0.84		
	Total	48	4.40	0.83		
Preposition choice	Concordance	16	4.20	0.84	1.13	0.36
	Word processor	16	4.80	0.45		
	Control	16	4.20	0.84		
	Total	48	4.40	0.74		
Writing	Concordance	16	4.20	0.45	2.00	0.18
	Word processor	16	4.80	0.45		
	Control	16	4.60	0.55		
	Total	48	4.53	0.52		
Word collocations	Concordance	16	4.60	0.55	0.46	0.64
	Word processor	16	4.20	0.84		
	Control	16	4.40	0.55		
	Total	48	4.40	0.63		
Word connotations	Concordance	16	4.60	0.55	0.00	1.00
	Word processor	16	4.60	0.55		
	Control	16	4.60	0.55		
	Total	48	4.60	0.51		
Phraseology	Concordance	16	4.60	1.14	0.05	0.95
	Word processor	16	4.40	1.14		
	Control	16	4.40	1.14		
	Total	48	4.47	1.06		
Spelling	Concordance	16	4.32	1.67	0.44	0.43
	Word processor	16	4.17	1.23		
	Control	16	4.41	.89		
	Total	48	4.30	1.34		
Total	Concordance	16	30.60	1.14	1.02	0.39
	Word processor	16	31.20	1.92		
	Control	16	32.40	2.70		
	Total	48	31.40	2.03		

marking scale used by AbuSeileek (2006) was adopted in this study. It had a range between 1–10 points: coherent and clear ideas 1–3, effective use of vocabulary 1–2, correct spelling 1, correct grammatical rules 1–2, mechanics, organization, and punctuation marks 1–2. The

test was verified by a team of two raters who were applied linguists. They were required to verify the test with regard to the clarity of instructions and appropriateness to the goals of the course. They presented some suggestions, including giving questions about eight writing aspects. Their comments and suggestions were taken into consideration. They also scored the students' papers. Each scored them independently, and neither knew the score given by the other. The inter-rater reliability was found to be .88, which is acceptable for the purposes of this study. The test re-test was administered to a pilot sample of 15 graduate students who were not included in this study with a two-week period between tests. The inter-rater coefficient reliability was found to be .91, which is acceptable statistically. Students were informed that they were participating in a study, and they agreed to participate. They were also informed that their grades in the course would not be affected by their participation in the study.

The second tool was a questionnaire and a semi-structured interview which aimed to investigate the participants' attitudes toward using concordance/word processor programs. The questionnaire and the semi-structured interview items were based on those used in Yoon & Hirvela (2004) who conducted a study that investigated ESL students' attitudes toward language corpus use in L2 writing. However, they were modified to suit the present study. The questionnaire included six areas: "The concordance/word processor is easy to use," "The concordance/word processor is useful in checking spelling errors," "The concordance/word processor is a helpful reference for grammar during writing production," "The concordance/word processor is a useful reference resource for vocabulary use during writing production," "The concordance/word processor is helpful during writing production," and "I like using the concordance/word processor." The respondents were asked to tick their degree of agreement on a scale of 1–5 (1: strongly disagree, 2: disagree, 3: neutral, 4: agree, 5: strongly agree). For the analysis of this Likert-type data, the mean scores of the students' responses were computed relative to the 5-point scale employed. Reliability of the instrument was checked by using Cronbach's Alpha which was 0.89, indicating an acceptable level. The questionnaire and the semi-structured interview were administered during the last week of the semester. In the semi-structured interview, students had to answer the open-ended question: What are the dis/advantages of the concordance/word processor in language skills/areas?

Procedure

The study was conducted in a computer lab, where a technician was available all the time for technical help. The subjects of the study met with the instructor once a week for 3 hours each session for 16 weeks. The first session was a short introduction about concordances, the framework, and the steps to be followed in use. To achieve the aims of this study, the subjects in the experimental groups (concordance and word processor) were trained to perform ten processes using concordances and word processors. The students were assured that this test was only for research purposes; hence it would not affect their marks in their course; on the contrary, they were informed that this experiment might improve their English. The researchers explained to the participants, through giving online examples, the steps that they would follow so as to give training using correctors and concordance programs. The instructor of the course (one of the researchers) trained the students on the use of concordances, mainly using the Coca Concordance program. The pre-test was administered in the first week of the study and it lasted for two hours after which the students

were randomly assigned into three groups: the first group which used concordances, the second group which used word processors, and the control group which used neither a concordance nor word processor.

Students in the first group were given some examples of words and some phrasal verbs by using the Coca Concordance (http://corpus.byu.edu/) (see Figure 1) to become familiar with the work of concordances. This had been chosen because it is readily accessible through the internet and because of the rich variety of functions that demonstrate many features of full concordances. The teacher also gave examples about how to use the concordance for checking word collocations, word connotations, phraseology, preposition choice, and spelling. The teacher distributed a file for students containing models of these aspects and students used the concordance as a reference resource for checking and correcting these aspects. After they became familiar with this part, they started to type parts of their reports, summaries, and papers and check their use, and other relevant alternatives of their chosen topics.

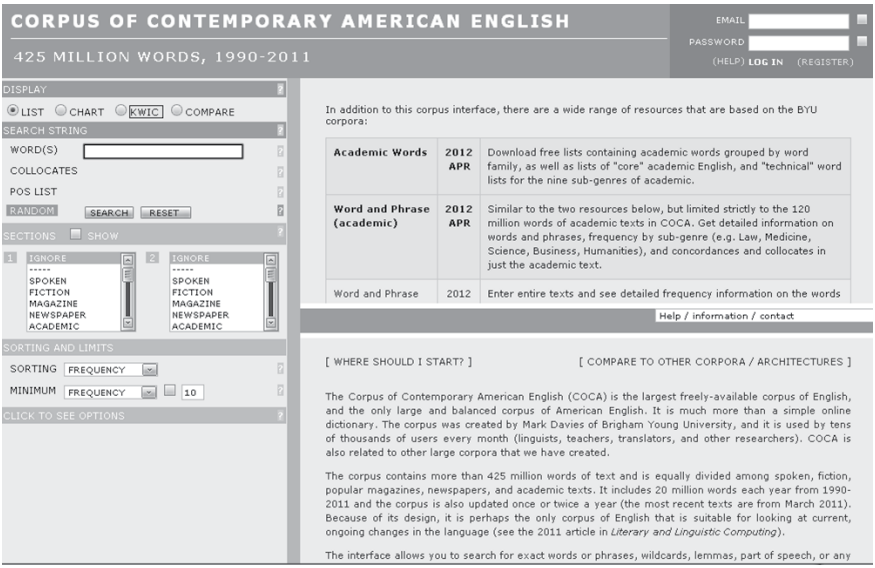

Figure 1. A Screenshot of Coca Concordance

The second group used a word processor, MS Word 2010, to check spelling and grammar errors. The researchers trained the group members to use the software. They gave them examples about how grammar and spelling errors are checked and corrected. They sent each student in the group a file with grammar and spelling errors, and they worked using the word processor to check the errors and correct them. Students were also trained to use the "Synonym" function, where they were trained to find synonyms of words. Finally, students started using the word processor to check grammar and spelling errors in their papers and correct them.

Statistical analyses

Three groups, using three different methods (concordance, word processor, and control) to improve their writing, participated in this study. Descriptive statistics including means and standard deviations for checking the method and writing aspect (grammar, synonym use, preposition choice, word collocations, word connotations, phraseology, spelling, and writing) were calculated. To find whether the findings were significant, ANOVA and a Post hoc Scheffe test were found for these variables, with the correction method (concordance, word processor, and control) as the independent variable and the students' mean scores on the writing post-test in different writing aspects as the dependent variable.

Results

The first question sought to investigate if there were significant differences between the experimental groups (concordance and word processor) and the control group on EFL students' overall performance in academic writing at the graduate student level. Table 2 shows means and standard deviations of graduate students' performance in writing for the experimental groups and the control group. According to Table 2, there was a significant effect in the overall mean scores of students on the writing post-test between the experimental groups and the control group at the $p < .05$ level. This shows that the computer-based method significantly outperformed the non-technology method on EFL performance in writing. As all experimental conditions were similar between the different treatment conditions except the different checking methods, it can be concluded that the large significant effect achieved by the experimental groups is attributed to the computer-based method used in checking and correcting errors.

The second question focused on whether there were significant differences between the treatment conditions due to the effect of technique (concordance vs. word processor) on EFL students' overall performance in academic writing at the graduate student level. Means and standard deviations for the groups in technique were calculated to answer the question. Table 2 shows that the concordance group significantly outperformed the word processor in the overall mean scores of the writing post-test, suggesting that the concordance is more effective than the word processor on the overall mean scores of the writing post-test ($p < .05$). As the instructor worked to ensure that all students in the two treatment conditions had the same conditions except the technique, it can be inferred that the main significant effect made by the sample here is attributed to the effect of the concordance rather than word processor.

The third question asked whether there were significant differences between the treatment conditions on EFL students' performance in aspects of academic writing at the graduate student level. To answer the question, ANOVA analysis for the three groups (concordance, word processor, and control) per each writing aspect (grammar, synonym use, preposition choice, word collocations, and word connotations, phraseology, spelling, and writing) was calculated as shown in Table 2. According to the table, the word processor group received higher mean scores than the concordance group and the control group in grammar, spelling and synonym use writing aspects. The post hoc Scheffe shows that the word processor group significantly outperformed the other two groups on the writing post-test in the following writing aspects: grammar, spelling, and synonym use. Similarly, there was a significant effect for the mean scores of the concordance group compared with the control

Table 2: Means and standard deviations of the student's scores on the post-test in writing aspects

Activity	Group	N	Mean	Std. Deviation	*F*
Grammar	Concordance	16	7.20	0.84	18.07*
	Word processor	16	9.20	0.84	
	Control	16	5.60	1.14	
	Total	48	7.33	1.76	
Synonym use	Concordance	16	7.40	0.71	14.70*
	Word processor	16	9.00	1.14	
	Control	16	6.00	0.71	
	Total	48	7.47	1.51	
Preposition choice	Concordance	16	9.00	0.71	14.70*
	Word processor	16	8.00	1.00	
	Control	16	6.20	0.84	
	Total	48	7.73	1.44	
Writing	Concordance	16	9.00	0.71	21.29*
	Word processor	16	6.80	0.84	
	Control	16	6.00	0.71	
	Total	48	7.27	1.49	
Word collocations	Concordance	16	9.00	0.71	21.00*
	Word processor	16	6.60	0.89	
	Control	16	6.00	0.71	
	Total	48	7.20	1.52	
Word connotations	Concordance	16	9.00	0.71	14.18*
	Word processor	16	7.00	1.00	
	Control	16	6.20	0.84	
	Total	48	7.40	1.45	
Phraseology	Word processor	16	8.80	0.84	21.29*
	Concordance	16	5.80	0.94	
	Control	16	5.80	0.84	
	Total	48	6.80	1.51	
Spelling	Concordance	16	6.47	1.63	18.57*
	Word processor	16	8.34	0.97	
	Control	16	5.64	0.87	
	Total	48	7.15	1.72	
Total	Concordance	16	65.87	1.41	268.63*
	Word processor	16	60.74	0.84	
	Control	16	49.17	1.92	
	Total	48	58.69	9.15	

* p. < .05

group; see Table 3. This seems to indicate that the use of a word processor and concordance is more effective as a reference resource for grammar and spelling than not using them. In addition, the word processor is found to be more functional than a concordance as a tool

Table 3: Scheffe Post Hoc Comparisons

Dependent Variable	GROUP		Mean Difference	Sig.
Grammar	Word processor	Concordance	2.00	0.02
		Control	3.60	0.00
	Control	Concordance	-3.60	0.00
Synonym use	Word processor	Concordance	1.60	0.04
		Control	3.00	0.00
	Control	Concordance	-3.00	0.00
Preposition choice	Concordance	Word processor	1.00	0.22
		Control	2.80	0.00
	Word processor	Control	1.80	0.02
Writing	Concordance	Word processor	2.20	0.00
		Control	3.00	0.00
	Control	Word processor	-0.80	0.28
		Word processor	-0.80	0.28
Word collocations	Concordance	Word processor	2.40	0.00
		Control	3.00	0.00
	Word processor	Control	0.60	0.49
Word connotations	Concordance	Word processor	2.00	0.01
		Control	2.80	0.00
	Word processor	Control	0.80	0.37
Phraseology	Concordance	Word processor	2.87	0.01
		Control	3.00	0.00
	Word processor	Control	3.00	0.00
Spelling	Word processor	Concordance	2.00	0.01
		Control	3.00	0.00
	Concordance	Control	3.00	0.00
Total	Concordance	Word processor	13.20	0.00
		Control	21.20	0.00
	Word processor	Control	8.00	0.00

used as a reference resource. As students had the same chance to write except for using language correctors or not, it can be inferred that the main significant effect here is attributed to using a word processor rather than its absence.

However, the other writing aspects did not follow a similar pattern. The findings in the table reveal that the concordance group obtained higher mean scores than the word processor group and the control group in the other writing aspects, including preposition choice, writing, word collocations, word connotations, and phraseology. The post hoc Scheffe test shows that there were significant differences between the concordance technique and control group. This appears to indicate that students who used the concordance could develop these writing aspects better than students in the control group who did not use a tool for checking and correcting errors. Similarly, the multiple comparisons post hoc analysis revealed that there were significant differences between the mean scores of students in the concordance group and the word processor group in favor of the concordance group in

Table 4: General students' attitude toward concordance and word processor (5 = strongly agree – 1 = strongly disagree)

		5		4		3		2		1			
Item	**Tool**	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	**Mean**	**SD**
1	Concordance	12	75.0	4	25	0	0	0	0	0	0	4.75	0.45
	Word processor	12	75.0	4	25	0	0	0	0	0	0	4.75	0.45
2	Concordance	16	100	0	0	0	0	0	0	0	0	5	0.00
	Word processor	12	75.0	4	25	0	0	0	0	0	0	4.75	0.45
3	Concordance	16	100	0	0	0	0	0	0	0	0	5	0.00
	Word processor	12	75.0	4	25	0	0	0	0	0	0	4.75	0.45
4	Concordance	9	56.3	7	43.7	0	0	0	0	0	0	4.56	0.55
	Word processor	16	100	0	0	0	0	0	0	0	0	5	0.00
5	Concordance	7	43.8	3	18.8	3	18.8	3	18.8	0	0	3.88	0.55
	Word processor	12	75.0	4	25	0	0	0	0	0	0	4.75	0.45
6	Concordance	10	62.5	3	18.8	3	18.8	0	0	0	0	4.44	0.89
	Word processor	12	75.0	4	25	0	0	0	0	0	0	4.75	0.45
Total		146	76.05	37	19.28	6	3.13	3	1.57	0	0	4.69	4.69

writing, word collocations, word connotations, and phraseology while these findings were insignificant for preposition choice; see Table 3. As the instructor worked to ensure that all students had the same opportunities to write except for using or not using concordances and word processors, the main significant effect in writing production by the participants in this study may be attributed to the concordance technique rather than to the word processor or the absence of these tools.

Question number four sought to investigate graduate EFL learners' attitudes toward concordances and word processors. In order to identify the students' attitudes toward the use of a concordance and word processor, a six-item questionnaire (see Table 4) was administered to students who used the concordance and word processor. Table 2 presents the results of the six items in addition to the general attitudes section of the questionnaire. As can be seen in Table 4, the general students' attitude was quite positive toward the concordance. The overall mean for all the items included in this section was 4.76 on a five-point Likert scale, which means that students who had been recently exposed to concordances in their language learning experience have a general positive attitude toward their new experience in general. However, certain items had lower and higher means when compared with the general students' attitude mean. For example, Item 4 "The concordance/word processor is a useful reference resource for vocabulary use during writing production" had the highest mean score (5). For this item, all students "strongly" agreed that the concordance is a useful reference resource for vocabulary use during writing production. Similarly, Item 1 "The concordance is easy to use" and Item 6 "I like using the concordance" had lower means

compared to other items on the questionnaire. However, the lowest means were for Item 2 and Item 3 "The concordance is helpful in learning spelling" and "The concordance/word processor is a helpful reference for grammar during writing production."

The findings related to the "word processor" group did not follow a similar pattern. The highest means were for Item 2 "The concordance/word processor is useful in checking spelling errors" and Item 3 "The concordance/word processor is a helpful reference for grammar during writing production." All students strongly agreed that the word processor is useful as a resource reference for spelling and grammar. The other items obtained a lower mean score. However, they show a quite positive attitude toward the easiness and usefulness of the word processor, and toward using it for vocabulary use during writing production. Similarly, the open-ended questionnaire revealed that students have a positive attitude toward the concordance and word processor. They reported that they are useful as reference tools in checking errors during writing production. They also reported that both tools are easy to use, and they have no difficulties in using them.

Discussion

Based on the findings of this study, there was a significant effect for the overall mean scores of students on the writing post-test between the experimental groups (concordance and word processor) and the control group. This result seems to suggest that using concordances and word processors in writing English may have an effect on students' achievement in writing. Other studies about the usefulness of computer-based tools for improving writing skills lent support to this finding (see, for instance, AbuSeileek, 2006; Cunningham, 2000; Stevens, 1999). This could be attributed either to the easy use of the word processor and concordance which do not require much effort by the users, or to the fact that the sample was graduate EFL learners at an advanced level who may not need more help in using those tools. Besides, they were fully aware of improving their English, as they are EFL graduates. There are also other factors that could have had some influence on the findings of this study; such as the limited number of participants in each group; the limited time spent using the tools; and the participants' total dependence on the output of using these tools, avoiding other components of writing processes and techniques and without checking the appropriateness of the output of their work. This shows the obvious effect of the concordance technique on the participants' writing performance. The results also revealed that the concordance group outperformed the other two groups with regard to the effect of using a concordance on the participants' academic writing aspects (grammar, synonym use, preposition choice, word collocations, word connotations, phraseology, spelling, and writing). This proves that teaching writing should be geared towards practical use of both concordances and word processors that include many writing aspects. Such findings may decrease the main concern of EFL teachers who focus on teaching grammar and correcting grammatical mistakes for writing purposes. This indicates more positive results than Cunningham's (2000) study which reported the importance of teaching grammar for writing purposes through using a word processor. It is necessary then to mention that this is the first study that attempted to investigate the effect of e-tools on eight aspects of academic writing at the graduate level.

To ascertain this result, all the participants reported in the semi-structured interview that they were not fully aware of their grammar and spelling mistakes, so the word processor and the concordance were very helpful in providing models which were supportive for

their writing production. The word processor was very helpful in checking errors, suggesting correct forms, and providing feedback about them. They added that the use of this tool facilitates the process of writing without any required effort. The interviewees assured that thanks should go to these tools as they freed them from more work, and actually enhanced their confidence to go ahead. It could be concluded that the students were more engaged in learning when they were given a chance to use technical facilitators. Furthermore, using an electronic corrector saves time, encourages learning in a low-anxiety setting and in an interesting environment.

To check the effect of using concordances on the learners' performance in writing English, a questionnaire was administered at the end of the semester to which the participants answered the items. The findings show that both concordances and word processors were easy to use and useful in writing production. The concordance was more preferable for vocabulary while students preferred to use the word processor for spelling and grammar. This finding was expected as the word processor focuses on finding spelling, style, and grammar errors, correcting them and providing feedback about them. However, the concordance is concerned with vocabulary use, including word collocations and use.

Semi-structured interviews show that students' visits to the websites were relatively high. They reported that despite difficulties, they like the sites of concordances. One reported that she found it an interesting way to spend time while writing reports and summaries in English. Another admitted that she visited the sites frequently to check spelling and grammar as these correctors are easy to use and no effort or time is wasted. A third said, "self-confidence when using the concordance not only in writing, but at the same time reading, grammar, pronunciation, and vocabulary." Two other students tried to discuss the philosophy of spreading such technical facilitators among all teachers and students at the university level. The participants stated that they became very attached to making use of the concordance software of the Coca Concordance program. All the respondents agreed that using a concordance helps to identify useful phrases in context. Some of the responses and comments in the interviews further supported the findings of the questionnaire. They agreed that a concordance uses authentic language in authentic contexts of different corpora. Corpora present words in real contexts. Corpus use strengthens their awareness of the art of writing. The respondents could also see different meanings of the phrasal verbs used in different contexts. They reported that at the beginning, they found it difficult, complicated and time consuming. However, after undergoing training, their attitudes became positive toward using concordancing for writing purposes. Such attitudes may result from the increased confidence which was developed through repeated training. These comments are inevitably in harmony with the findings of several previous studies mentioned in the literature review.

Conclusions and implications

In summary, the findings of this study are a great contribution to the move from theory to practice in the field of teaching writing skills in the following aspects: how to use e-tools to enrich correct use of context; how to skip delivering instructions on how to accurately and correctly write an essay and instead use available technologies to write; and how to fulfill this generations' demand for high quality innovations. The findings of the present study are of practical importance to EFL teachers and university English language learners on the use of concordances, especially those who so far are not familiar with such tools.

The study also revealed that concordances more than word processors can enhance EFL learners' use of technology for linguistic purposes. The results of the study do emphasize the superiority of concordancing over word processing in improving EFL learners' academic writing. Therefore, concordance applications or DDL is now opening a new track and an efficient guide for learners to scrutinize the effect of different contextual uses of sentence components. Moreover, the findings of this study may present a practical computer-based tool other than the word processor that can be used in checking errors, which may be helpful in improving EFL students' problems in writing. Concordance programs can allow more emphasis on the learners' self–centeredness and independent learning to develop their performance in academic writing, too.

Finally, the researchers realized that the advantages of having a small number of participants are more than expected. First, all students received equal opportunities to participate and practice in a comfortable academic environment. Second, the learner-centered strategy prevailed almost all the time. Third, electronic activities make it fun for the students to follow up and gain experience in some skills. Finally, it was easy and enjoyable for the instructor to follow up and give a hand closely. The participants had access to more sites that inevitably helped them in writing a good report on a study in TEFL. They also got the basics in writing a summary and analysis of a relevant study in the TEFL area. It could be concluded that the learners found it useful, efficient and motivating.

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