

**UNIVERSITI PUTRA MALAYSIA**

***USING WEB-BASED LANGUAGE REFERENCE TOOLS TO SOLVE  
LINGUISTIC PROBLEMS IN ACADEMIC WRITING AMONG IRANIAN  
POSTGRADUATE STUDENTS IN A MALAYSIAN PUBLIC UNIVERSITY***

**SEDIGHEH SHAKIBKOTAMJANI**

**FPP 2017 9**



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By

**SEDIGHEH SHAKIBKOTAMJANI**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,  
in Fulfillment of the Requirements for the Degree of Doctor of Philosophy**

**April 2017**

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## DEDICATION

This thesis work is dedicated to my parents, who have always loved me unconditionally and whose good examples have taught me to work hard for the things that I aspire to achieve. Moreover, this work is dedicated to my husband, Reza Alazmani who has been a constant source of support and encouragement during the challenges of graduate studies and life. I am truly thankful for having you in my life. This work is also dedicated to my lovely children, Aria and Ava. You have made me stronger, better and more fulfilled than I could have ever imagined.



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Doctor of Philosophy

**USING WEB-BASED LANGUAGE REFERENCE TOOLS TO SOLVE LINGUISTIC PROBLEMS IN ACADEMIC WRITING AMONG IRANIAN POSTGRADUATE STUDENTS IN A MALAYSIAN PUBLIC UNIVERSITY**

By

**SEDIGHEH SHAKIBKOTAMJANI**

**April 2017**

**Chairman : Habsah Binti Hussin, PhD**  
**Faculty : Educational Studies**

Electronic literacy plays a major role in the rapidly changing environment of the language learning and teaching. Corpus consultation or learner concordancing has been acknowledged to enhance second language writing and language pedagogy by promoting data-driven learning and providing authentic examples. *Onlineconc.com* website has been developed as the main research instrument. It consists of multiple reference resources such as concordancers, thesaurus, online dictionaries and search engines such as Google and Google Scholar; they act as cognitive tools for solving linguistic problems while writing academically in English. Participants of this study were six postgraduate students. This study is based on a qualitative case study, which was supported by quantitative data. Various sources of data, such as surveys, stimulated recalls, interviews, screen recordings, and query logs were employed to achieve in-depth descriptions of participants' corpus consultation pattern. This study consists of two phases, in the first phase 27 postgraduate students were asked to respond to surveys. They were trained how to use different resources in *Onlineconc* website. Moreover, the researcher raised students' awareness regarding collocation and lexico-grammatical words. In the second phase, six motivated participants volunteered for a case study. All six participants recorded their laptop screens while consulting with *Onlineconc* while composing their research paper or dissertation. The results revealed that the process of composing was facilitated by consulting with the combination of reference resources. The findings of various data sources indicated that participants were able to solve 85% of their lexical and grammatical problems that led to appropriate text formulations and revisions. Findings from interviews and stimulated recalls, revealed that concordancing along with other online resources have resulted in more accuracy. Participants of this study found reference resources as useful cognitive tools to verify their intuitive linguistic hypotheses for negotiating meaning, and acquiring authentic language.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**MENGGUNAKAN ALAT-ALAT RUJUKAN BAHASA WEB BERBASIS  
WEB UNTUK MENGELOLA MASALAH LINGUISTIK DALAM PELAJAR  
AKADEMIK DENGAN PELAJAR PELAJAR IRANIAN DALAM  
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Oleh

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**Fakulti : Pengajian Pendidikan**

Literasi elektronik memainkan peranan yang penting dalam perubahan persekitaran yang pesat bagi pembelajaran dan pengajaran bahasa. Konsultasi korpus atau konkordans pelajar telah diakui dapat meningkatkan penulisan bahasa kedua dengan menggalakkan pembelajaran dipacu data, dan menyediakan contoh autentik. Dalam kajian ini, laman web *Onlineconc.com* telah dibangunkan sebagai instrumen utama. Ia terdiri daripada sumber rujukan berganda, seperti konkordancer, tesaurus, kamus dalam talian dan enjin carian, seperti Google dan Google Scholar; mereka bertindak sebagai alat kognitif untuk menyelesaikan masalah bahasa semasa menulis secara akademik dalam bahasa Inggeris. Kajian ini berdasarkan kajian kes kualitatif dan data kuantitatif telah digunakan untuk menyokong data kualitatif. Pelbagai sumber data, seperti tinjauan, imbas kembali terangsang, temu bual, rakaman skrin, dan log pertanyaan telah digunakan untuk mencapai pendeskripsian yang mendalam tentang pola penggunaan sumber rujukan peserta. Kajian ini terdiri daripada dua fasa, fasa pertama, 27 pelajar pascasiswazah telah diminta untuk menjawab bagi meninjau dan telah dilatih cara untuk menggunakan sumber yang berbeza dalam laman web *Onlineconc*. Selain itu, penyelidik meningkatkan kesedaran pelajar dari segi istilah kolokasi dan kata Leksiko-tatabahasa. Dalam fasa kedua, 6 peserta telah dipilih untuk kajian kes. Semua 6 peserta merakam skrin komputer riba mereka sambil berunding dengan *Onlineconc* semasa mengarang kertas penyelidikan atau disertasi mereka. Keputusan menunjukkan bahawa proses mengarang telah dipermudah dengan rundingan beserta kombinasi sumber rujukan. Dapatan pelbagai sumber data menunjukkan bahawa peserta dapat menyelesaikan 85% masalah leksikal dan tatabahasa mereka yang membawa kepada formulasi teks dan semakan yang sesuai. Dapatan dari temu bual dan imbas kembali terangsang, memperlihatkan bahawa konkordans beserta dengan sumber dalam talian yang lain telah mengakibatkan ketepatan yang lebih. Peserta kajian mendapati sumber rujukan sebagai alat kognitif yang berguna untuk menverifikasikan hipotesis linguistik intuitif mereka bagi tujuan perundingan makna, dan memperoleh bahasa autentik.

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I certify that a Thesis Examination Committee has met on 5 April 2017 to conduct the final examination of Sedigheh Shakibkotamjani on her thesis entitled "Using Web-Based Language Reference Tools to Solve Linguistic Problems in Academic Writing among Iranian Postgraduate Students in a Malaysian Public University" in accordance with the Universities and University Colleges 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 Doctor of Philosophy.

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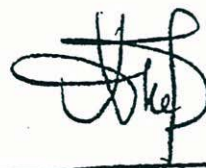
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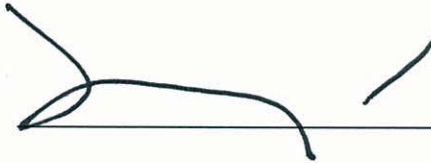
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## LIST OF ABBREVIATIONS

BNC	British National Corpus
COCA	Corpus of Contemporary American
CALL	Computer Assisted Language Learning
DDL	Data-Driven learning
EAP	English for Academic Purposes
ESL	English Second Language
GIPH	Google Informed Pattern Hunting
GIPD	Google Informed Pattern Defining
GALL	Google -Assisted language Learning
GS	Google Scholar
KWIC	Key Word In Context
L1	First Language
L2	Second Language
POS	Part of Speech
SLA	Second Language Acquisition

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the Study

In recent years, innovative technologies such as personal computers and Internet technology have rapidly been changing the processes of foreign or second language writing (Stapleton & Radia, 2009; Warschauer, 2007). In this digital age, an online reference resource is one of the technologies that offers support for second language writers. Particularly, innovations in data processing and storage capacity have changed traditional reference resources such as dictionaries, and thesauri into online resources. They provided abundant and various linguistic information that cannot be available in offline resources due to lack of space. Moreover, they have created innovative reference resources with an excessive potential to assist foreign language writers (Frankenberg-Garcia, 2012; Tono, 2012).

One of these recent reference resources is called concordancing or using corpora. Learners' direct use of corpora has mainly been recommended as a useful tool to supply learners with typical and frequent patterns in which a linguistic item is used (Bloch, 2007; Chambers, 2005; Hyland, 2003; Johns, 1991, 1997; Stapleton & Radia, 2009). Johns (1988, 1991) who coined data-driven learning (DDL) have gradually introduced concordancing as a language pedagogy tool. In recent years, corpus consultation has begun to be empirically studied as a reference tool for second language writing (Chambers & O'Sullivan, 2004; Gaskell & Cobb, 2004; Kennedy & Miceli, 2010; Park, 2012; Sun, 2000; Yoon, 2005, 2008; Yoon & Hirvela, 2004; Yoon, 2014). These previous studies revealed that if motivated non-native second language learners were trained regarding the use of concordancing, they would solve lexical and grammatical problems while writing academically in English. On the other hand, the former studies on concordancing as a reference tool have been largely limited to special corpus tools used only for correcting errors or translation tasks. These studies frequently were performed in classroom settings, and they commonly introduced corpus tools as the only reference resources (Murphy & Roca de Larios, 2010; Stapleton, 2010).

The present study aimed to investigate how and to what extent postgraduate students consult with recently emerging reference resources in combination with more traditional online resources to complete writing task in a university setting. Specifically, the study examined non-native English language writers' reference-resource consultation while engaging in an authentic writing independently (writing a research paper or dissertation) over six months. The role of concordancing in combination with other resources examined as a cognitive tool to increase the participants' cognitive powers to solve the immediate linguistic problems that they encountered while writing an academic paper. The background and justification of the study are discussed as follows.

## 1.2 Concordancing and Language Learning

The terms ‘corpora’ and ‘corpus linguistics’ are accepted terms in applied linguistics. Corpus-based language study has started in the 1960s (Sinclair, 1969). This technology is dependent on computer technology, and applied linguistics expanded the growth of corpora to multi-million words since the 1980s. Corpus linguistics defines a corpus as “a collection of naturally occurring texts compiled for linguistic study” (Biber, Conrad, & Reppen, 1998).

Concordancing refers to a listing of each occurrence of a word (or pattern) in a text or corpus, presented with the words surrounding it. Computer software named a concordancer display concordance lines of a word or phrase in the text by giving a list of instances in the immediate, authentic contexts. A concordancer shows the linguistic item in the center with its immediate context (co-text), which is called *keyword in context* (KWIC). KWIC could be read horizontally to show how certain linguistic items are utilized in context (i.e., language use). Concordance output can be read vertically to show repeated patterns of those linguistic items (Hyland, 2003; Tognini-Bonelli, 2002). Concordancing emphasizes the close relationship between lexis, grammar, and frequency of use. In recent times, corpora and concordancing tools have started to be used by language teachers and learners.

Based on the findings of past research, using concordancing offers considerable benefit to language teaching and learning (Bloch, 2007; Conrad, 2000, 1999; Chambers, 2005; Granath, 2009; Hyland, 2003; Johns, 1988; O’Sullivan, 2007; Stapleton & Radia, 2009). First, concordancing provides information related to the frequency of linguistic items in a given context. Secondly, it enables learners to experience ‘real language,’ or language used in authentic contexts in contrast with contrived examples in non-corpus based grammar books. Moreover, concordance examples display the functions of words in various contexts and genres and increase learners’ language awareness. It enables learners to have access to phraseologies (collocation, colligation) and the lexico-grammatical patterns that cannot be available (or not as effectively) through using other resources such as dictionaries. Additionally, as learners consult with a corpus, they are involved in inductive learning when they analyze plenty of linguistic examples. This learning in corpus analysis is frequently associated with Johns’ (1988, 1991) *data-driven learning* (DDL).

In DDL, learners act as researchers to analyze corpus data and make their discoveries concerning how language works. Therefore, learners learn more from examples provided by a concordancer instead of using definitions in dictionaries or grammar books.

Different types of corpora and concordancing tools with different functionalities are freely available (Römer, 2006). Furthermore, there are two types of the corpora employed in research and classroom applications (Boulton, 2010). Firstly, several past studies have used general and balanced corpora; it means they include the range of text categories included in the corpus. Hence, a general corpus, which contains both

written and spoken data (e.g. the BNC), is balanced corpora (Boulton, 2010). Moreover, these language data are tagged for part-of-speech (POS) information. The British National Corpus (BNC) and the Corpus of Contemporary American English (COCA) are instances of the general and balanced corpora. Secondly, in other previous studies, researchers and teachers compiled specialized corpora from the text types and genres based on the students' disciplines to explicate lexical and grammatical patterns. Furthermore, most recent studies have often reported that teachers are required to prepare and train the learners for concordancing.

### 1.3 Academic Writing

The term *academic writing* refers to the forms of expository and argumentative prose used by university students, and researchers to convey a body of information about a particular subject. Academic writing is the process of breaking down ideas and using deductive reasoning, formal voice and third person point-of-view. Many studies have reported that after having studied English for years, non-native students experience lots of difficulty in their writings. For example, Johns (1997) found that many non-native speaking graduate and undergraduate students, after years of ESL training, often fail to recognize and appropriately use the conventions and features of academic written prose. Researchers have highlighted many reasons that the academic writing of even highly advanced and trained non-native students continues to exhibit numerous problems and shortcomings (Badley, 2009; Hinkel, 2002; Johns, 1997; Leki, 2003). Such shortcomings include, among others, the ineffectiveness of writing courses in preparing students for academic writing tasks and the disparity between the existing teaching and assessment practices in academic writing contexts. The effectiveness of writing courses in preparing NNS students for actual academic writing in universities is discussed by Leki & Carson (1997). They found that "what is valued in writing for writing classes is different from what is valued in writing for other academic courses" (p. 64).

What seems obvious to assert is that in academic writing one should always follow rules of grammatical accuracy, since the end-user or consumer of the writing is likely to be an expert in particular fields. Hence, it is vital that writing is clear through compliance with rules of punctuation and the conventions of grammar to maintain clarity and avoid ambiguity in expression. Leki and Carson (1997) emphasized that the teaching of writing in ESL and EAP programs needs to provide students with linguistic and writing skills that can enable the learners to be involved with and make sense of the new information.

On the other hand, in teaching L2 writing, rhetorical and discourse features of written English have often been overemphasized. What has become of lesser importance, as Hinkel, (2004) highlighted that language aspect such as the grammar and vocabulary which construct academic text, which in turn can be organized into a coherent written academic discourse, have received less importance. In other words, no matter how well discourse is organized or how brilliant the writer's ideas may be, it would be hard to understand them, if the language is unclear. When it comes to assessment, raters seem to be more concerned with the linguistic errors made by the writers than the

rhetorical and discourse features of texts. This incongruity between teaching and assessment practices might be a potential reason behind student's failure in academic writing. In this study, online reference resources act as cognitive tools to assist postgraduate Iranian students during academic writing regarding grammatical and lexical accuracy.

#### **1.4 Concordancing and Second Language Writing**

Hyland (2003) classified the uses of concordancing into two main categories. The first category is associated to concordancing as a research tool, which enables learners to discover the underlying rules and regularities of a given linguistic item from its concordance lines. Concordancing is typically used and practiced in the previous research and classroom applications (Boulton, 2009). In second language writing research, concordancing has been particularly discovered in the form of DDL activities in a language course for learning the language such as learning specific lexical, grammatical or genre items (Cresswell, 2007; Lee & Swales, 2006; Turnbull, & Burston, 1998).

The second application of concordancing is considered as a reference tool. Writers consult with concordancer to fill the gaps while writing in the target language. In these circumstances, using concordancing does not implicate learning particular linguistic items or language learning by itself. More accurately, it functions as the problem-solving tool to assist writers in completing writing task successfully. Several latest studies examined the effects of concordancing on writing from the perspective of the reference tools (Frankenberg-Garcia, 2005; Kennedy & Miceli, 2001, 2010; Park, 2010; Yoon, 2005, 2008).

Nevertheless, these two common applications of concordancing are related to each other. Since there is a relationship between learning and problem-solving; either form of concordancing use would involve differing degrees of language learning and problem solving. In consequence, the majority of past studies used corpus tool for correcting or revising errors of writing required similar levels of both goals of the problem-solving and explicit language. However, the tasks were aimed to teach explicit language learning goals (Chambers & O'Sullivan, 2004; Gaskell & Cobb, 2004; Gilmore, 2008; O'Sullivan & Chambers, 2006; Todd, 2001).

Although, the results of previous studies (Yoon, 2014; Chang, 2014) revealed that concordancing served as a useful tool by providing writers with the instances of language use concerning lexico-grammatical patterns and frequency information. However, the success of non-native English language writers in achieving appropriate results varied. The success was determined by several important factors such as language proficiency, learning style, the nature of the task. Overall, second language writers were more interested in using concordancing for finding solutions to their authentic problems while writing (Lee & Swales, 2006; Watson Todd, 2001). Thus, the potential of concordancing for supporting non-native second language writers can

be recognized as a reference tool to check the accuracy and appropriacy of the lexical and grammatical patterns of their writing.

## 1.5 Google Assisted Language Learning

In recent years, Google-assisted language learning (GALL), using the Web as a corpus and Google as a concordancer, has been considered as one of the highly promising areas to revolutionize language pedagogy and second language writing. Researchers such as Conroy (2010) and Fujii, (2007) suggested that Internet search engines serve as the concordancing tools (Krajka, 2009; Kuo, 2008; Sha, 2010; Shei, 2008). The majority of GALL studies found that the use of the Web as a corpus and Google as the biggest search engines serve as a parallel concordancer. These studies have revealed that Web concordancing has advantages over traditional corpus resources in the following ways. Firstly, most of the learners are familiar with search engines. Palfrey & Gasser (2008) maintained that language learners are “digital natives” who have extensively been referring to Google not only to obtain the content information but also to examine their hypotheses about English forms. Consequently, consulting with Google doesn’t require complicated query syntax and most of the learners are familiar with the basic functions of search engines and formulate their strategies for efficient use of the huge corpus.

Few corpora can match the size and accessibility of search engine such as Google. A language learner with access to the Internet can quickly check the frequency of occurrence of any given phrase on the web by performing a simple search of the phrase in double quotation marks.

From the perspective of cognitive linguistics, natural language has to do with phraseology as informed by frequency effects. The web, simply due to its sheer size, is well prepared to offer insights on the frequency of occurrence. As Shei (2008) expounds, “Google can provide solutions to many of the research questions of phraseology which even a billion-word corpus can hardly handle” (p. 70). Indeed, the Google search engine is used to search for any information that the word Google now appears in the dictionary as a verb (Chinnery, 2008). Variant spellings of the words can be “Googled” to see which version generates the most results, then which can be assumed to be the “correct” option. Phrases enclosed within double quotation marks can also be googled for insights into grammaticality and naturalness.

The use of Google as corpus and concordancer is not without its shortcomings. Wu et al. (2009) noted that because the web is not vetted, search results have the potential of being inaccurate or “dirty”. The publicly available Corpus of Contemporary American English (COCA) (Davies, 2008) observes that while Google is a great search engine, there are many things that a corpus designed by corpus linguists can do which Google cannot. For example, COCA can measure changes in phrases over time, provide lists of frequent collocates of keywords, and perform other criteria-based searches, while Google can only search for specific words when enclosed in double quotation marks, phrases.

## 1.6 Reference Resources for Second Language Writing

As second language writers develop to graduate levels, they are required to pay more attention to the accuracy and appropriacy of the lexical and grammatical features in their writing, since greater accuracy is necessary for conveying complex content and ideas. On the other hand, past research has revealed that second language writers were highly-trained in developing the idea and organizing the text still at advanced levels of language proficiency struggled with lexis and grammar in their writing (Hinkel, 2002; Silva & Silva, 2009; Yoon, 2005, 2008). In comparison to writing in their first language, learners pay far more attention and spend much more time on lexical search and syntactic encoding to express their ideas in second language text accurately (Cumming, 2001; Murphy & Roca de Larios, 2010).

Accuracy/appropriacy in written text has received much attention professionally and academically and played a major role in assessing students' writing (Hegelheimer, 2006; Yoon, 2008); however, providing enough support for the second language writers regarding accuracy and appropriacy is not satisfactory at the graduate level. Instructors do not provide feedback on the lexical and grammatical characteristics in students' papers at universities. Even in the academic writing courses at graduate levels, the lexical and grammatical accuracy is likely to be ignored in favor of the idea development and text organization upon the effects of process-oriented writing approach (Canagarajah, 2002; Yoon, 2005).

In this respect, the only reference resource which learners get immediate support during composing and revising is a dictionary to solve their linguistic problems. In fact, as corpus-informed lexicography and text processing technologies have been rapidly developed, popular varieties of reference resources have been freely available. Nowadays, More various reference resources consist of corpus-based learners' dictionaries, collocation dictionaries, and concordancing tools are available compared to the past (Frankenberg-Garcia, 2011; Tono, 2010). However, based on the existing research, these reference resources are significantly underused by second language writers. Their reference resource consultations are limited to searching the equivalent in bilingual dictionaries (Frankenberg-Garcia, 2005, 2011; Nesi, 2012). Therefore, to address the writers' difficulties regarding accuracy issues, it is important to raise second language writers' awareness regarding the functions of reference resources. Instructors should assist them in selecting the most appropriate reference resources for consultation based on their linguistic needs (Nesi, 2012). Second language writing research and pedagogy can play a major role by assisting writers not only to enhance their writing performance but also to promote their confidence and autonomy in academic writing (Ridge, 2010; Kuo, 2008; Yoon, 2008).

## 1.7 Statement of the Problem

As noted before, graduate students at universities are required to pay more attention to accuracy and appropriacy of the lexical and grammatical features in their writing, since greater accuracy is necessary for conveying complex content and ideas. Based

on the past research, second language writers were highly trained in developing the idea and organizing the text still at advanced levels of language proficiency struggling with lexis and grammar (Hinkel, 2002; Silva & Silva, 2009; Yoon, 2005, 2008).

In the context of Universiti Putra Malaysia, Iranian postgraduate students as non-native English writers also face difficulties in phraseology, lexical and lexicogrammatical structures. They are not familiar with concordancing tools as instant supports to address the grammatical and lexical accuracy of their writing. There is a lack of study in the context of university to train non-native students in concordancing and other reference resources to solve their linguistic problems independently during academic writing.

Moreover, previous studies have examined the potential of concordancing as a reference tool in assisting second language writers to solve grammatical, lexical and lexico-grammatical problems encountered during their writing. However, these studies were exploratory in nature regarding task settings and data collection methods.

However, some of the previous studies recruited university students to use special corpus tools for correcting written error, revising their text, for language learning and translation (Chambers & O'Sullivan, 2004; Gilmore, 2008; Kennedy & Miceli, 2010; O'Sullivan & Chambers, 2006; Frankenberg-Garcia, 2005). These types of tasks have two important limitations. Firstly, they didn't examine the process of academic writing in which second language writers engage in a university setting (Murphy & Roca de Larios, 2010; Stapleton, 2010); however, they investigated the uses of concordancing merely for correcting errors and revision stage. Therefore, it might not give much insight into how second language writers deal with language problems at the time of composing. A more naturalistic task is required in a university context, in which students use concordancing and other reference resources as a reference tools to complete their academic paper over one semester.

Previous studies also had limitations regarding the scope and methods of data collection. Most studies that investigated the effects of concordancing on written error corrections and revisions only reported the results of the participants' corpus tool use as their final written products. However, they did not describe the processes that participants must go through while interacting with the corpus tools. Specifically, the degree of interaction, the purposes, and the processes in which participants go through while consulting with the corpora while engaging in their academic writing has not been thoroughly investigated. (Gaskell & Cobb, 2004; Gilmore, 2008; O'Sullivan & Chambers, 2006). On the other hand, previous studies that examined the processes of corpus consultations (Frankenberg-Garcia, 2005; Yoon, 2005, 2008) relied on the participants' self-reports, and manually-kept query logs. However, the data obtained through these methods only provided an insufficient information regarding thinking processes that the writers essentially experienced during consulting with corpus tools. Self-reports or retrospective data can often be selective and incomplete reconstructions of what occurred (Kasper, 1998; Park & Kinginger, 2010). Moreover keeping manual corpus query logs during writing task might be a source of disruption and consequently hinder the participants from searching a corpus.



As a final point, in most previous research, corpus tools were consulted as the main reference resource while writing the given tasks. Currently second language writers have been using some reference resources, which they were familiar with before. Therefore, limiting participants' reference resource consultation to concordancing tools would not reflect this real-life choice for non-native second language writers (Frankenberg-Garcia, 2005). As recently suggested by some researchers, it would be more useful to examine how concordancing can be used strategically in combination with Google and other references resources (Conroy, 2010; Flowerdew, 2010; Kaur & Hegelheimer, 2005; Pérez-Paredes, Sánchez-Tornel, & Alcaraz Calero, 2012; Yoon, 2014).

## 1.8 Aims of the Study

To address these gaps recognized from past research, the researcher examined how Iranian postgraduate students at Universiti Putra Malaysia independently used *Onlineconc* interface including web concordancers, Google and online dictionaries for solving their linguistic problems while composing or revising their academic writing.

The present study aims at examining the potential of reference resources as a cognitive tool, which boosts non-native second language writers' cognitive powers, and facilitates their problem-solving process. Particularly, this study aimed at describing the processes of the participants' interactions with the reference tool and finally shed light on how it assisted non-native English language writers in academic writing and how it increased more autonomy in writing.

## 1.9 Objectives of the Study

1. To examine Iranian postgraduate students' perceptions and challenges in academic writing.
2. To investigate how participants consult and interact with *onlineconc*
3. To investigate the types of linguistic problems participants addressed with the reference suite.
4. To examine what reference resources participants consulted for different types of problems.
5. To identify how using *onlineconc* led to language learning.
6. To determine the strategies the participants employed in their interactions with the language reference suite.
7. To investigate the benefits and drawbacks of *onlineconc* as an academic English writing assistance.
8. To identify the individual differences among participants regarding corpus consultation characteristics.

## 1.10 Research Questions

1. What are Iranian postgraduate students' perceptions of and challenges in academic writing?
2. How do participants consult with *onlineconc*?
3. What types of linguistic problems do the participants consult with *onlineconc* reference suite?
4. What reference resources do they consult for different types of problems?
5. How did online language reference resource consultation (*Onlineconc*) lead to language learning?
6. What strategies did the participants employ in their interactions with the language reference suite?
7. What are the benefits and drawbacks of *Onlineconc* as an academic English writing assistance?
8. What are the individual differences among participants regarding corpus consultation characteristics?

## 1.11 Significance of the Study

As mentioned before, due to the effect of process-oriented writing pedagogy, the emphasis has been shifted to content and idea development in writing. On the other hand, second language writers still require support concerning language features namely accurate and appropriate use of vocabulary and grammar. However, at the graduate level, students are not provided with sufficient writing support in content courses. Therefore, the incorporation of language reference resources and concordancers might assist second language writers to receive instant support for solving linguistic problems that occurred during academic writing. Past research has taken for granted the use of concordancing for linguistic purposes; however, DDL could not entirely explain its particular functions and effects on second language writing.

This study is significant due to the following reasons. Firstly, the study tracked participants' independent uses of *Onlineconc* as reference resources through screen recording while composing and drafting their academic writing such as writing research papers out of classroom setting. Then, this study aims to fill the gap by identifying reference resource consultation while composing and revising out of classroom setting. In the previous studies, corpus consultation during writing largely examined the editing/revising stages of the writing process only in classroom settings. Secondly, in contrast to previous studies, the current study examined how existing familiar language reference resources (online Monolingual and bilingual dictionaries and thesaurus, Google) and concordancing can complete each other to solve participants' linguistic problems. Therefore, these two considerations regarding accomplishing academic writing task and tools featured in *Onlineconc*, improved the validity of this study to provide a more comprehensive picture of reference resource consultation in academic writing.

Third, this study has paid special attention to the methodology that has been adopted in educational studies by pursuing both theory and practical applications of given instructional or technological interventions (Anderson & Shattuck, 2012; Wang & Hannafin, 2005). This study employed multiple sources of data sources such as screen recordings, a computer-generated query log, stimulated recalls and interview to generate data through triangulation, to achieve more precise and reliable data on participants' cognitive processes during interactions with *Onlineconc*. Even though corpus consultation was investigated as problem-solving activity in previous studies, this current study gave comprehensive descriptions and analyses of reference resource consultation during writing by using the conceptual frameworks of the problem-solving cycle in cognitive psychology.

Finally, as participants consulted with different resources of *Onlineconc*, they became more active learners, because they made an effort to discover underlying language patterns on their own during their corpus searches (Sun, 2000). Consequently, independent use of reference resources assisted participants to become autonomous writers. With regard to research implications, the findings of the present study contributed to shed light on Computer Assisted Language Learning (CALL) research in general and corpus-based research in particular.

## **1.12 Definition of Key Terms**

### **Corpus**

A corpus is usually defined as a “principled collection of naturally occurring texts for linguistic study” (Biber & Conrad, 1998) and a concordancer is a computer software program that rapidly searches a corpus and produces a list of incidences of a given linguistic item (a word or phrase).

### **Concordancer**

A concordancer is a program that allows the user to consider the context of a specific word by taking into account the words preceding and following it from a collection of texts called a corpus (Allan, 1999). The “keyword in context (KWIC)” presents multiple instances of the keyword and textual patterns. Cross-referencing helps to provide students with examples, rules, and correct patterns (Bennett, 2010).

### **Academic Writing**

The term *academic writing* refers to the forms of expository and argumentative prose used by university students, and researchers to convey a body of information about a particular subject. The academic writing process is often associated with multiple stages of writing such as drafting, composing, revising, and editing (Zamel, 1983). In his study, academic writing is a generic term to cover the writing of research articles, conference papers, and dissertation. In this study, online reference tools were used to

solve participants' linguistic problems such as collocation, colligation, lexical bundles, and grammar during drafting, composing and revising processes.

### **Onlineconc**

The researcher designed and developed *Onlineconc* website. It allows the user to access multiple language reference resources that are freely available on the Web. The program features nine tabs, in which different types of Web concordancers, such as COCA, Just The Word, Flax, Ozdic, Frazeit, thesaurus, Google, Google scholar and online dictionaries can be accessed.



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