Impact of Googling Techniques on Deaf and Hearing-Impaired Students’ L2 Writing Performance

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Abstract
Improving writing ability specifically for DHI is an important component of the acquirement of a language. The innovative aspect of this study is enhancing writing ability through online based instruction by applying Googling Techniques (GT) as an instructional platform. The purpose of this study was two-fold: (i) to examine the impact of web-based instruction GT, (ii) to consider corrective feedback techniques Strategic and Interactive Writing Instruction (SIWI) on their L2 writing performance. To this end, a group of 60 Iranian female and male DHI students at the elementary level participated in the treatment. Participants of the study were divided into two groups of 30. The subjects in experimental groups benefited from two particular instructional focuses of this study include GT and SIWI. In order to assess the effect of the treatment pre and posttests design were utilized. Consequently, the data were analyzed through t-tests. The findings revealed that strategy treatment was successful in improving the participants’ writing ability. Therefore, the findings suggest that online strategy-based instruction can positively influence the writing ability of Iranian DHI learners. This study may have pedagogical implications for
material practitioners, CALL package designers and distance teaching planners to include strategy instruction in English courses.

**Keywords:** Googling Techniques (GT), Strategic Interactive Writing Instruction (SIWI), Deaf and Hearing-Impaired (DHI), Web-based, Technology, Writing performance

### Introduction

There is a growing body of literature that recognizes the importance of modern technology in English language learning and teaching in 21st era of education. Many studies revealed the effectiveness of technology application in enhancing language learning as it helped the teaching and learning activities of language skills and competencies for any levels of education (Zhang & Zou, 2020). Mayor (2018) introduces multimedia principle which refers to the idea that, multimedia instructional messages foster “meaningful learning”. Meaningful learning happens as students select related information from what is represented, control the sections of information into a consistent mental representation, and attach the recently created representation to others.

It has been demonstrated that in the last 20 years distance learning has shifted from the margins into the core of education programs (Xiao, 2018). The continued expansion in technology tools such as online dictionaries, electronic books, online private language courses, virtual schools, online journals, and other information resources allow learners to participate in communicational settings and improve their knowledge of the second language L2 according to their purposes. Most of the studies related to technology integration in ELT were conducted for the other skills not specifically for DHI students. Teachers and students in this level were claimed to have more ICT literacy compare to the lower level of education. They also got enough exposure on technology use through their professional development and education program (Ansyari, 2015; Aşık et al., 2019; Dooly & Sadler, 2020; Hafifah & Sulistyo, 2020).

It should be added the learner autonomy is one of the required elements of Internet-based education. In this environment, learners deal with self-instructional materials which help them to develop and enhance their knowledge. Besides, distance courses encourage learners to do research and interpret information autonomously and improve the demand for self-centered education. Therefore, research in this field may be efficient and valuable in the procedure of language teaching and learning (Reinders, 2018). Additionally, some studies found that teachers and students have a good perception toward technology use in language teaching (Goodwin et al., 2015; Liu et al., 2017; Muslem et al., 2018; Silviyanti, T. M., & Yusuf, 2015; Valtonen et al., 2017).

Recent developments in education have heightened the necessity of learning English. There is an increasing concern about people who have fallen short to learn this international language. As for DHI students studying in schools in Iran, since there is a great increase in their population, society is responsible to care for their changing needs. In this respect, one of the sources of the challenge for DHI students is to read and to write in English, while they need to simultaneously develop a language for communicative purposes (Clark, Gilbert, & Anderson, 2011). English is not easily acquired by DHI students (Jackendoff, 1994), and while signing is fully accessible to them for acquisition, it is rarely readily available in-home environments.

The literacy development of some DHI students may be characterized as a special case of bilingual language and literacy acquisition that is similar in many ways to the literacy development of other bilingual populations (Hinkel, 2001). One of the most important events of
the current decades is Electronic Learning. Importantly, web-based learning seems to be a useful tool which greatly helps to facilitate education for people around the world. However, it is a necessity for creating e-learning available to deaf people. GT as an example has provided unprecedented access to information and interaction for not only a special group of people but also people from different ages and groups. One important group of internet users is people with disability, DHI, for instance. Some of the internet websites are specially established for disabled persons.

Generally, it should be added they do not disable just they have the incomplete skills for doing something in their personal life. There are e-learning applications for such people. In the same line, a sign language dictionary can serve multiple functions. It facilitates the learning process of sign language in special educational institutions for the deaf and helps normal hearing people too, who are in daily contact with deaf people to learn how to communicate with them in the sign language. The previous studies manifested that most of the students who were deaf could not master in the complicated writing method (Cheng & Rose, 2008).

Worldwide and national investigations had illustrated that many DHI individuals entered in school without the acquisition of proper language or the oral or manual source of communication. Subsequently, without the acquisition of basic language in this study (sign language), the process of education may be affected on written language with simple grammatical structures, limited vocabulary, and challenges in regards to verbal accent and agreement (Rodrigues, Abdo & Silvia, 2012). Based on the above-stated information, the focus of the present study is on a specific sample of deaf students from non–English-speaking homes who are learners represent diverse cultural and linguistic backgrounds in the south of Iran, Bandarabbas. The importance of this study also lies in that it will attempt to discover the impact of technology on their writing skill in L2 by using GT and SIWI. In addition, this study is important since it points to the facets that can be developed and improved during teaching written English to DHI students. Furthermore, the present study sounds important since writing, the focus of the study will create a good opportunity for DHI students who write in their own language and will bring about positive self-esteem in them which is critical in learning another language.

Teaching English to these students more effectively is a challenging and problematic component in the education philosophy of DHI people. The study will actually target issues which will finally end up with an innovative method of teaching better writing in L2 to the target people. In another part of the research, SIWI will be used in order to develop a writing framework for instruction with DHI students that are typically modeled in a classroom setting. In other words, SIWI maybe manifests a great deal of promise in the DHI education field for improving the writing among students through interaction. Writing is mostly learned in school, unlike other language skills. Since yet no research has investigated the writing processes of Iranian DHI students, the main objective of the present study will be to investigate DHI students’ writing processes, strengths and weaknesses in their texts and what improvement these students showed in the development of the organization and content of their text.

The results of this study can inform second language learners about the beneficial aspect of web-based techniques for language learning. To fill in the gaps of the previous studies which lack exploring the empirical result of the effectiveness of technology implementation, especially in the elementary level of Iranian DHI students, the present study aims to investigate students’ writing progresses, strengths and weaknesses in their texts and what improvement these students showed in the development of the organization and content of their text. It seems that this study can benefit a wide range of stakeholders at both theoretical and application levels. To achieve the purpose of the study the following research questions were addressed:
Q1. Do DHI students receiving web-based writing instruction GT display significance growth in L2 written English?

Q2. Do DHI students who receive SIWI demonstrate significant growth in L2 written English?

Literature Review

Deafness is a disability that is hidden or invisible. Obviously, by looking at a child, you cannot see whether that child is deaf or not (IDEA, 2004). The term “deaf” shows the continuum of hearing loss that students have which under the Individuals with Disabilities Education Act (IDEA) qualifies them to receive special education services, including the eligibility to receive their education at a deaf school (Moores, 2001). Considering the advantages of online instruction, the Internet to access a variety of authentic resources on every conceivable subject, including teacher and student-created content is noteworthy. Furthermore, the capability to keep human and machine interaction in diverse formats like text, speech, video, etc.

Jamali & Izadpanah (2017) considered the effects of PowerPoint presentations on reading comprehension of deaf and hard of hearing students in Iranian exceptional high schools. Their findings indicated significant differences between the mean reading comprehension scores of the two groups. The purpose of this study was to explore whether film-based Dynamic assessment (DA) could affect English writing of Iranian deaf children. In other words they attempt to consider the relationship between the use of films in dynamic assessment and the writing ability of Iranian deaf Children (M Rashtchi, M Laleh, 2015). The results of the structured interviews showed that almost all students had positive attitudes towards the use of films during the DA procedure.

Kalani & Asgharinekah (2015) in the study in titled with the effectiveness of linguistic play software package on reading accuracy and comprehension of students with reading disorder investigated the positive effectiveness of Linguistic Play Software Package on reading accuracy and comprehension of students with reading disorder. According to the results of the study, training with Linguistic Play Software Package has more positive effect in increasing reading accuracy.

Based on the premise that Google allows ESL learners keep abreast of the wide range of naturally occurring patterns, based on frequency occurrences, and thereby find appropriate patterns in the process of language learning and L2 writing, very few empirical studies have been done in deaf field. In a related study, some studies which have been conducted in this way (Conroy, 2010; Geluso, 2011; Sha, 2010; Shei, 2008; Stapleton & Radia, 2009; Wu 2010; Wu et al., 2010), some of them are reviewed and discussed.

Wu (2010) studied the students’ use of Web-based corpus, through an off-line collocation learning system, constructed based on Google, to examine how they use the pattern-hunting (PH) to expand their text. The findings of his observation and questionnaires manifest that three out of 12 students did some kind of pattern-hunting, and the result was promising. He mentioned that syntactic errors, erroneous sentence structures, and imperfect sentences were seen throughout their work. He makes an argumentation due to the constraints of the topic themselves and their family and their limited language ability, their writing exhibited a narrow range of vocabulary and few idiomatic expressions. For instances, the four most common words used were like, come, want and live.

Sha (2010) mentioned that the dynamic corpus or search-engine-based corpus has superior to usability, search speed, the number of solutions and above all, preference investigations. He also showed that Google has spellchecker that helps students. He concluded that the outstanding capability of Google as a concordance can take place in terms of GIPH and
GIPD. Correspondingly, Geluso’s (2011) study concentrated on the naturalness of GIPD, based on the frequency of occurrences on the Web. He chose 25 Japanese EFL learners and set them to write essays about nine paragraphs. Following training, he got them to Google draft their essays and correct their erroneous patterns. Then he asked 4 native speakers of English to blind rate learners’ Google-informed and non-Google-informed patterns, in terms of their naturalness. The result of his study showed that by using the web as a corpus and Google as a concordance, students can improve the naturalness of their writing.

Based on Fajardo et al. (2010), the use of signed videos added to text hyperlinks in web pages to improve efficiency in web searching. Their findings indicated that hyperlinked signed videos did improve web navigation somewhat for signing deaf users and reduced the need for users to have strong word categorization skills. As the second techniques were used in this study, Strategic and Interactive Writing Instruction (SIWI) largely involves guided and collaborative writing. Students work along with the teacher to co-construct, observe and edit a piece of text. When the group reaches a consensus to add a phrase or a sentence to the text, the teacher writes the students’ word-for-word expressions (including grammar and meaning errors as they are communicated) on an easel. Writing is seen as a skill that is obligatory and functional, rather than just an activity done in school (McAnally, Rose & Quigley, 1994).

According to Belisle (1996), it gives a chance to the teacher to monitor the process of the students’ writings to save class time for the teacher’s assignments and comments. According to Greenspun (1999), websites are documents, programs or databases: a document style website is, for example, the static web directory provided by yahoo.com. Websites providing e-commerce services like amazon.com are databases. What is probably the most widely-quoted definition of writing was given by Aristotle. Words spoken are symbols of affections or impressions of the spirit; written words stand for words spoken. Importance of Googling techniques in language learning and ESL writing in terms of language learning and L2 writing, it is stated that the Web armed with Google, based on Shei’s (2008) ground-breaking work, let ESL/EFL learners study particular words and patterns to check whether the text they have produced represents standard and natural language usage (GIPD) (Geluso, 2011; Stapleton & Radia, 2009). Finally, it is worth mentioning that technology has brought about many revolutionizes in language learning pedagogy. Although some studies have been conducted on strategy instruction in Iran, a little experiment has been done to evaluate the impact of web-based instruction on enhancing DHI students’ writing.

Method

Participants

The samples of the study were Iranian DHI learners. The sampling was based on a convenience sampling procedure. The participants of this study were selected from among the deaf community in Bandar Abbas. The participants were 42 female and 18 male students studying in Adib Language Academy. They ranged from 18 to 40 in terms of age. They were placed in the relevant groups after taking placement test. Also, the Oxford Placement Test was conducted at the beginning of the treatment to double-check the placement. Consequently, participants were randomly assigned to two female and male experimental group and control group.

The demographic information illustrates the distribution of respondent's categories in relation to gender and age as described in Table 1 and 2:
Table 1
Demographic Background of the Participants (Gender)

| Sex     | N  | Percentage |
|---------|----|------------|
| Female  | 42 | 70.0       |
| Male    | 18 | 30.0       |
| Total   | 60 | 100.0      |

Table 2
Demographic Background of the Participants (Age)

| Age     | N  | Percentage |
|---------|----|------------|
| 18-25   | 27 | 45.0       |
| 26-30   | 16 | 26.6       |
| 31-35   | 10 | 16.6       |
| 36-40   | 7  | 11.8       |
| Total   | 60 | 100.0      |

The results of the age showed that the highest number is related to the age group between 18 and 25 years and the lowest number belong to the age group of 36 to 40 years. In terms of gender, the highest option was for women with (70%) and the lowest option was for men (30%).

Materials
For the purposes of this study, the participants received writing instruction in L2 through GT as well as SIWI, in which they were provided with daily more frequent, written model utterances for beginners and elementary levels. These utterances actually comprised the materials of this study.

Instruments
To answer the research questions, the data of the study were collected through using a writing test as a pretest. All learners in the two groups were asked to write a short text with the given vocabularies. In the last session of the treatment, a topic was given as a posttest to all learners in the two groups to write a short paragraph about it to check their possible improvement. The validity of the pretest and posttest was confirmed by experienced university professors who expressed their views and provided their suggestions. Their suggestions were taken into consideration.

Procedure
To achieve the purposes of the study, the writing classes held three days a week, and each session took 60 minutes within three months. Twelve topics chose by the researcher who is working in the field, and after improving writing through GT and SIWI, the participants asked to write short paragraphs about the given topics and words. All the participants enjoyed the coverage of the same educational situation. The present study benefited from a quantitative research method to investigate the impact of using GT as web-based instruction on teaching
writing. First, a proficiency test used to assess the participants’ homogeneity. Then, the learners were assigned to two homogenous groups, one as the experimental group (GT and SIWI) and the other as the control group (Traditional group). Also, the researcher elicited information about the participants’ age, gender, race, and hearing status. Furthermore, to answer the posed research questions, the researcher looked within the participants’ writing samples to identify changes in their L2 produced texts in terms of vocabulary length as one of many possible measures for growth in writing fluency. To put it in a nutshell, to date various methods have been developed to investigate the writing development of the deaf in L2. In this study, however, the teacher provided them with some concepts related to daily issues and asked them to write some short paragraphs. The data analysis method was T-Test and independent tests to examine the questions.

Data Analysis

To analyze the data, IBM SPSS Statistics 24 software was utilized. In addition to descriptive statistics, t-test was employed to check the significance of the difference between the performances of different groups. In addition, In order to understand the results of the questionnaire properly, the frequency distribution procedure was applied.

Results and Discussion

Results

The DHI students’ writing ability at the initial phase and at the end of the experiment was observed through pre-test and post-test, and the data were analyzed in terms of descriptive and inferential statistics. Table3 demonstrates the results of the inferential statistics utilized. There are three interrelated approaches to determine normality, and all three should be conducted. In order to check the normality Skewness, Kurtosis and The Kolmogorov-Smirnov test (K-S) simultaneously had used.

Table 3
K-S test results

| Component                        | K-S | Sig | Results                        |
|----------------------------------|-----|-----|--------------------------------|
| Attitude toward the use of GT    | .154| .130| P< 0.05 and is normal          |

As can be seen in Table 3, the significance level obtained in all components is greater than 0.05 and accepted H0 with 95% confidence. It stated that the research data followed the normality of the parameter and that parametric tests should be used to analyze the data.

Table 4
Skewness and Kurtosis test results

| Component                        | Skewness | Kurtosis |
|----------------------------------|----------|----------|
| Attitude toward the use of GT    | .383     | -1.096   |

As can be seen in Table 4, the amount of skew in all components is among +2 and -2, and this shows that the variable distribution has a normal skew and parametric tests should be used to analyze the data. The first research question addressed Do DHH students receiving web-based writing instruction (Googling techniques) display significance gains in L2 written English? The answer to this question will be given by a test called the Levine test.
Table 5

| Group | G | N  | Mean | Std. Deviation | Std. Error Mean |
|-------|---|----|------|---------------|----------------|
| EG    | Pretest | 30 | 1.6333 | .55605 | .10152 |
|       | Posttest | 30 | 3.3333 | .47946 | .08754 |
| CG    | Pretest | 30 | 1.5667 | .50401 | .09202 |
|       | Posttest | 30 | 1.5333 | .50742 | .09264 |

Table 6

| Equal Variances | t-test for Equality of Means |
|-----------------|-------------------------------|
| Sig. (2-tailed) | Mean | Std Error | 95% Confidence Interval of the Difference |
|                 | T    | Df    | Lower | Upper |
| E Equal variances assumed | 1.6 | .20 | 58 | - |
| G variances assumed | 7 | 0 | 12.6 | - |
| Equal variances not assumed | 8 | 56.7 | 0 | 0 |
| | 71 | .00 | .134 | - |
| E Equal variances not assumed | 12.6 | | 1.700 | 00 |
| C Equal variances assumed | .23 | .62 | .255 | 58 |
| G variances assumed | 6 | 9 | .79 | 3 |
| Equal variances not assumed | .255 | 57.9 | 9 | 3 |
| | 97 | .79 | .130 | - |
| C Equal variances not assumed | 9 | 3 | 57 | .2280 |

According to the information in the table, it can be seen that based on the sig value, which is less than 0.05, 99% of the H0 assumptions and H1 assumptions are confirmed in the ensemble. This means that the use of GT at the Writing level is different in both the pre-test and the posttest. So far, only the average difference between the pre-test and post-test groups has been confirmed, and the direction in which it means which one has a higher average for this variable has not been discussed.

The first research objective was to identify whether or not DHI students receiving web-based writing instruction and GT display significant growth in L2 written English. Based on the findings of the study, it can be concluded that GT is one of the good techniques that helps DHI students in using more rectified structures and save the time for them to have a better writing performance. Sha (2010) believed that despite the fact that Google can be extremely helpful for
DHI learners, as have been found in the current study, only a few studies have referred to it as a writing source. Maybe it is mostly because Google was never defined as a corpus. Basically, Google has a widespread series of books, magazines and newspapers that can serve as a large corpus. Most importantly, Google provides a very simple way to be used. Anybody who has Internet access can do a lot of searches based on various sites and other sources. Surprisingly, the Google quotation mark search tool can assist second language writers to detect unnatural and incorrect phrases easily.

The second question addressed Do DHH students receiving SIWI display significance gains in L2 written English? The answer to this question will be given by a test called the Levine test.

**Table 7**

*Group Statistics*

| G     | N   | Mean  | Std. Deviation | Std. Error Mean |
|-------|-----|-------|----------------|-----------------|
| EG    | Pretest | 30 | 1.6333 | .55605 | .10152 |
|       | Posttest | 30 | 3.3333 | .47946 | .08754 |
| CG    | Pretest | 30 | 1.5667 | .50401 | .09202 |
|       | Posttest | 30 | 1.5333 | .50742 | .09264 |

**Table 8**

*Independent Samples Test*

| G     | Levene’s Test for Equality of Variances | t-test for Equality of Means |
|-------|----------------------------------------|-------------------------------|
|       | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |
|       | F | Sig. | t | Df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| EG    | Equal variances assumed | 1.67 | .200 | - | - | 1.7000 | 5 | 1.9683 | 3 | 7 |
|       | Equal variances not assumed | - | - | 58 | .000 | 0 | .1340 | - | - |
| CG    | Equal variances assumed | .236 | .629 | .255 | .58 | .799 | .03333 | 1.305 | -.22804 | .29471 |
|       | Equal variances not assumed | .255 | 57.9 | 97 | .799 | .03333 | .1305 | -.22804 | .29471 |
Based on the information in the table, it can be seen that based on the sig value, which is less than 0.05, 99% of the H0 assumption and the H1 default assumption is confirmed. This means that the use of SIWI at the Writing level differs between the pre-test and the posttest. So far, only the average difference between the pre-test and posttest groups has been confirmed, and the direction in which it means which one has a higher average for this variable has not been discussed.

The second research objective was to identify DHI students who SIWI demonstrates significant growth in L2 written English or not. It concluded that students in the control group showed little variation between pre and posttest concerning primary traits of writing. The results of the analyses are fairly straightforward for the treatment group SIWI had a significant and positive impact on students’ writing outcomes. In contrast; the comparison group started the course with very basic language instruction. Instruction in the comparison group may have led students to regress to use of simple and less varied constructions in their posttest writing even though they were capable of more. Additionally, students produced longer texts at posttest in compare with a pre-test.

Conclusion

According to the results, the following discussion and conclusions are drawn: The first research objective was to identify whether or not DHI students receiving web-based writing instruction and GT display significant growth in L2 written English. Based on the findings of the study, it can be concluded that GT is one of the good instructions that helps DHI students in using more rectified structures and save the time for them to have a better writing performance with the high motivation in learning. Only a few studies have referred to Google as a writing source. Maybe it is mostly because Google was never defined as a corpus.

DHI student's writing has a tendency to manifest a presentation of thoughts, inability to create or set up said thoughts because of an absence of semantic and syntactic aptitudes. According to the results learning English is not easy for DHI students, but using Google can assist them to have more idea to write. It shows that they suffer from using fewer phrases, greater incomplete sentences and primary syntactic structures, less subordinate clauses, less noun phrase modifiers, omissions of feature phrases in writing. DHI students face outstanding troubles by writing manifested by several errors in the sentence because of their problems in getting access to and learning syntactical structures, each auditory or visually. Finding suggested Google can be an effective instructional tool to enhance DHI learning and independence.

The second research objective was to identify DHI students who use SIWI as the feedback instrument demonstrates significant growth in L2 written English or not. It concluded that students in the control group showed little variation between pre and posttest concerning primary traits of writing. Both grammar and vocabulary also receive planned and incidental instruction. Students receive direct instruction on grammar rules and have follow-up practices. In addition, points for remediation are raised and discussed in class. The results of the analyses are fairly straightforward for the treatment group SIWI had a significant and positive impact on students’ writing outcomes. In contrast; the comparison group started the course with very basic language instruction. Instruction in the comparison group may have led students to regress to use of simple and less varied constructions in their posttest writing even though they were capable of more. Additionally, students produced longer texts at posttest in compare with a pre-test.
Impact of Googling Techniques on Deaf and Hearing …

Discussion

Basically, Google has a widespread series of books, magazines and newspapers that can serve as a large corpus. Most importantly, Google provides a very simple way to be used. Anybody who has Internet access can do a lot of searches based on various sites and other sources. Surprisingly, the Google quotation mark search tool can assist second language writers to detect unnatural and incorrect phrases easily. The use of technology in teaching English is now easier and more accessible than ever before. To use a teacher or to attend a class was the only way in the past time; other tools have entered the field recently, although the impact of these new tools on the size of the classroom and teacher learning cannot be overstated. They are good supplements for DHI people with learning a new language. With the increasing spread of human science and technologies, learning English has taken a different form. New day-to-day tools in the field of science help with this learning so that it can be used at the same time. Learning English through technology, software, artificial intelligence, hardware, new software, and digital gadgets is one of the most widely used items in recent years and a good complement to learning in the classroom.

Technology in teaching English is one of the new items that can be considered effective in the process of better learning of learners. These technologies can be a new way of learning. Therefore, based on the obtained results is suggested to the future researcher it is recommended that: In future research, the same research can accomplish with the other people with problems, and finally, considering that only comparing variables in a sample and more specifically in a particular city, so it is possible to develop these researches to expand the results, as well as to prove the results and examine them further. Other researches in this field should be done on another context. The findings of this study will be useful in teaching-learning activities. It will also be valuable in favor of the further research works in this field.

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