



## Web-Based Googling Techniques and Strategic-Interactive Writing Instruction: A Study of Deaf and Hearing-Impaired Students' L2 Writing Performance

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### ABSTRACT

This study investigated the impact of web-based instruction Googling techniques (GT) and strategic and interactive writing instruction (SIWI) on the L2 writing performance of deaf and hearing-impaired (DHI) Iranian learners. To this end, 60 Iranian male and female DHI students at the elementary level participated in the study. The participants were divided into two experimental and control groups. The experimental group benefited from two particular instructional focuses of this study: GT and SIWI. In order to assess the effect of the treatment, a pre-test and post-test design was utilized and the obtained results were statistically analyzed. The findings revealed that online strategy-based instruction could positively affect the writing performance of Iranian DHI learners. The findings can have pedagogical implications for material practitioners, CALL package designers, and distance teaching planners to include strategy instruction in English courses for the DHI population.

**Keywords:** Deaf and hearing-impaired (DHI); Googling techniques (GT); Strategic interactive writing instruction (SIWI); Web-based, Technology; Writing performance

### INTRODUCTION

A growing body of literature recognizes the importance of modern technology in English language learning and teaching in 21 eras 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 level of education (Zhang and Zou, 2020). (González et al., 2018) introduces the 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, switch the information section to 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

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participate in communicational settings and improve their knowledge of the second language. Most studies related to technology integration in ELT were conducted for the other skills not precisely for DHI students. Teachers and students in this level were claimed to have more ICT literacy than the lower education level. They also got enough exposure to technology through their professional development and education program (Ansyari, 2015; Aşık et al., 2020; Dooly and Sadler, 2020; Hafifah and Sulisty, 2020). At the same time, 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 significant 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 write in English, while they need to simultaneously develop a language for communicative purposes (Clark, Gilbert, and Anderson, 2011). English is not easily acquired by DHI students (Jackendoff, 1996), and while signing is fully accessible to them for acquisition, it is rarely readily available in-home environments.

One of the most important events of the current decades is Electronic Learning. Importantly, web-based learning seems to be a helpful tool that significantly facilitates education for people worldwide. 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 a particular group of people and people from different ages and groups. A critical group of internet users is people with disabilities, DHI, for instance. The literacy development of some DHI students may be characterized as a particular case of bilingual language and literacy acquisition that is similar in many ways to the literacy development of other bilingual populations (Hinkel, 2001). Some internet websites are specially established for disabled persons. In reality, these people are not disabled. They just have 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, particularly educational institutions for the deaf, and helps ordinary hearing people in daily contact with deaf people with deaf people to learn how to communicate with them in sign language. Previous studies have manifested that most of the students who were deaf could not master the complicated writing method (Cheng and Rose, 2008).

Based on the above-stated information, the present study's focus is on a specific sample of deaf students from non-English-speaking homes who are learners and represent diverse cultural and linguistic backgrounds in the south of Iran, Bandarabbas. The importance of this study lies in that it attempts to discover the impact of technology on their L2 writing skill by using GT and SIWI. 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 language, to bring about positive self-esteem in themselves, 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 present study targets issues which will finally end up with an innovative method of teaching better writing in L2 to these people. In another part of the study, SIWI develops a writing framework for instruction with DHI students typically modeled in a classroom setting. In other words, SIWI may manifest a great deal of promise in the DHI education field for improving the writing among students through interaction.

## **LITERATURE REVIEW**

Deafness is a disability that is hidden or invisible. 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 (Moore and Miller, 2001). Obviously, by looking at a

child, you cannot say whether the child is deaf or not.

As for using technology to instruct deaf and hard-of-hearing students, Jamali and Izadpanah (2017) investigated the impact of PowerPoint presentations on them in Iranian exceptional high schools. Their findings revealed a significant difference between the mean of the reading scores of the two groups. In the same line, Kalani, Asgharinekah, and Ghanaei Chamanabad (2015) examined the impact of Linguistic Play Software Package on reading accuracy and comprehension of students with reading disorder. The result of their study showed that Package had a significant impact on the participants' reading accuracy.

In connection with employing Google techniques, Wu (2010) investigated language learners' use of Web-based corpus to inspect how they used pattern-hunting to develop their text. His findings revealed that one-fourth of the learners did some sort of pattern-hunting. Therefore, he claimed that the learners showed a slight range of vocabulary and rare idiomatic expressions in their writings because of topic limitations and imperfect language capability.

In his study, Sha (2010) showed that Google has a spellchecker that helps students. He added that Google as a concordance could work as GIPH and GIPD. Geluso's (2011) focused on the naturalness of GIPD, based on Web's frequency of occurrence. He concluded that students could expand the naturalness of their writing by using the web as a corpus and Google as a concordance.

In the same line, Fajardo et al. (2010), studied the use of signed videos added to text hyperlinks in web pages to improve efficiency in web searching. They concluded 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" (p. 259).

As for Strategic and Interactive Writing Instruction (SIWI) used in the current study, Rose et al. (2004) state that this form of instruction

"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" (p. 187).

It has to be generally stated here that Googling techniques, as an offshoot of technology use in language learning and ESL writing, can play a significant part in L2 instruction. But, although technology has revolutionized language learning, little has been done in Iranian context to check the impact of web-based instruction on the development of DHI learners' writing performance. Thus, answers were sought for the following research questions of the current study to fill the existing gap.

### Research Questions and Hypotheses

*Q1. Do DHI students who receive web-based writing instruction (GT) display significant growth in L2 written English?*

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

**Ho1.** DHI students who receive web-based writing instruction (GT) do not display significant growth in L2 written English.

**Ho2.** DHI students who receive SIWI do not demonstrate significant growth in L2 written English.

### METHOD

#### Design of the Study

The present study benefited from a pretest, posttest, Quasi-experimental research design to investigate the impact of using Googling Techniques (GT) as web-based instruction, and Strategic and Interactive Writing Instruction (SIWI) on Deaf and Hearing-Impaired Students' L2 Writing Performance.

#### Participants

The study participants were 60 Iranian deaf and hard of hearing learners (DHI) and their teacher. The teacher was a hearing female who

had taught some courses at a deaf community for five years. She also had three years of experience as a public educational interpreter for the deaf. The learner participants were selected through a convenience sampling procedure from among the male and female students of a Deaf Community (Adib Language Academy) in Bandar Abbas, Iran. They ranged

from 18 to 40 in terms of age. They were randomly divided into two male and female groups after taking a placement test. The demographic information in Tables 1 and 2 below illustrate the distribution of the participants' categories in terms of gender and age:

**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

### Materials

For this study, the participants received writing instruction in L2 through Googling Techniques (GT) and Strategic and Interactive Writing Instruction (SIWI), in which they were provided with common daily written model utterances for beginners and elementary levels. These utterances comprised the materials of this study. Googling techniques are concerned with the clear structures available in the net that are useful as a communication channel. Rose, McAnally and Quigley (1994) state:

SIWI involves guided and collaborative writing. Students work along with the teacher to co-construct, monitor 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" (p. 187).

### Instruments

The data of the study were collected through writing tests as pretest and posttest. Before the treatment, all the participants in the two groups were asked to write a short text with the given vocabulary (pretest). In the last session of the treatment, a topic was given to all them to write a short paragraph about (posttest), 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.

### Procedures

To conduct the study, the learners were assigned to two homogenous groups: the experimental group (GT and SIWI) and the control group (Traditional group). The writing classes for both groups were held three days a week, with each session 60 minutes within three months. Twelve conceptual topics related to daily issues were chosen by the study's

researcher, who was herself teaching deaf and hard of hearing students. The participants were asked to write short paragraphs about the topics in the writing classes. The experimental group was provided with prefabricated sentences as a pattern in Google and Strategic and Interactive Writing Instruction (SIWI) (SIWI) to improve their writings, and were asked to write short paragraphs by using googling techniques. The researcher looked within the participants' writing paragraphs to identify their syntactical problems and changes in their L2 produced texts regarding vocabulary length as one of many possible measures for growth in writing fluency. The control group received on such attention. Finally, the posttest was administered to gauge the participants' improvement due to the two mentioned ways of instruction. The

obtained results were statistically analyzed to find answers to the posed research questions. Details are presented in the following sections.

## RESULTS

The DHI students' writing ability at the initial phase and at the end of the experiment was observed through pretest and posttest, and the data were analyzed in terms of descriptive and inferential statistics. Table 3 below 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 Kolmogorov-Smirnov test (K-S) were simultaneously 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 more than 0.05 and accepted H0 with 95% confidence. This shows 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

According to Table 4, the amount of skew in all components is between +2 and -2. This shows that the variable distribution has a typical skew and parametric tests should be used to analyze the data. The first research question was, 'Do DHI students who receive web-based

writing instruction (GT) display significant growth in L2 written English? The answer to this question will be given by the Levine test as follows:

**Table 5**  
**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 6**  
**Independent Samples t-Test**

		The equality of Variances		t-test for Equality of Means						
F	Sig	T	Df	Sig. (2-tailed)	Mean	Std. Error	95% Confidence Interval of the Difference			
							Lower	Upper		
E	Equal variances assumed	1.67	.200	-	58	.000	-	.134	-	-
G	Equal variances not assumed	1.67	.200	12.68	71	.000	-	.134	-	-
C	Equal variances assumed	.236	.629	.255	58	.793	.0333	.130	-	.29471
G	Equal variances not assumed	.236	.629	.255	57.9	.793	.0333	.130	.2280	.29471

According to the above Tables, 99% of the H0 and H1 assumptions are confirmed in the ensemble. This means that the use of GT at the writing level is different in both pretest and the posttest, but 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, it can be stated that GT is one of the promising techniques that helps DHI students in using more rectified structures and save time for them to have a better writing performance. Sha (2010) believed that even though Google can be helpful for DHI learners,

as has been found in the current study, only a few studies have referred to it as a writing source. Maybe it is because Google was never defined as a corpus. Google has a widespread series of books, magazines and newspapers to serve as a large corpus. Most importantly, Google provides a straightforward way to be used. Anybody who has Internet access can do many searches based on various sites and other sources.

The second research question addressed in the present study was: Do DHI students receiving SIWI display significant growth in L2 written English? Levine test will answer this question too.

**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 t-Test**

		Levene's Test for Equality of Variances				t-test for Equality of Means				
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
E G	Equal variances assumed	1.679	.200	-12.682	58	.000	-1.70000	.13405	-1.96833	-1.43167
	Equal variances not assumed			-12.682	71	.000	-1.70000	.13405	-1.96845	-1.43155
C G	Equal variances assumed	.236	.629	.255	58	.799	.03333	.13057	-.22804	.29471
	Equal variances not assumed			.255	97	.799	.03333	.13057	-.22804	.29471

Based on the above tables' information, it can be observed that with the sig value, which is less than 0.05, 99% of the H0 assumption and the H1 default assumption are confirmed. This means that the use of SIWI at the Writing level differs between the pretest and the posttest. So far, only the average difference between the pretest 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 see if DHI students who receive SIWI demonstrate significant growth in L2 written English. The analysis results are relatively straightforward for the treatment group SIWI and show that SIWI has a significant positive impact on the participants' writing performance. In contrast, the control group started the course with elementary language instruction. Instruction in this group may have led the students to regress to use simple and less varied constructions in their posttest writing even though they were capable of more.

## DISCUSSION

Based on the above results in this section, the study's research questions are answered and related issues are discussed.

**RQ1:** Do DHI students receiving web-based writing instruction (GT) display significant growth in L2 written English?

GT instruction has been considered a classroom approach to teaching DHI students to write for various purposes and audiences. The results of this study showed that the application of GT is effective in increasing DHI students' writing achievement in English. The results showed significant differences between the experimental and the control groups. Both groups improved in their writing performance, but the experimental group improved much more than the control group due to receiving (GT). It is to be noted that improvements were seen in their punctuation, vocabulary and word order. What is interesting about this finding is that previous studies have shown that the deaf create shorter writings with fewer complex sentences and that they have been reported to

have difficulty with cohesion and coherence in writing. But here, the reverse was observed.

The results related to this research question are compatible with those of the study done by Zhou (2016) titled, "Using the Internet to Open another Window of English Reading for Hearing Impaired Students." In this study, the researcher integrated network information technology with English extracurricular reading by giving deaf and hard of hearing students' independent reading and facilitating their reading strategy. He concluded that DHI students learn English by doing, reflecting the significance of English teaching in special education through technology.

**RQ2:** Do DHI students who receive Strategic and Interactive Writing Instruction (SIWI) demonstrate significant growth in L2 written?

The obtained statistical results demonstrated significant growth in the participants' L2 written performance when SIWI was implemented. When utilizing SIWI, learners had an opportunity to discuss different topics in the class, which finally led to their writing development. This finding shows that Strategic and Interactive Writing Instruction (SIWI) is a productive and comprehensive approach which can be exploited for DHI L2 writing progress. The finding aligns with the previous SIWI studies' findings that students who undergo this type of instruction develop greater linguistic competence in ASL and build meta linguistic knowledge for both languages (Wolbers, K., Bowers, L., Dostal, H., and Graham, S., 2013). SIWI is thus an instructional approach that can be used with emerging bilingual DHI students. It can be used to develop both fluency and proficiency in English while developing proficiency in sign language (Cummins, 2000).

Technology in teaching English is one of the new items that can be considered influential for better learning. 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 further research works in this field.

## CONCLUSION

Based on the study's findings, it can be concluded that GT is one of the effective instructional methods that helps DHI students in using more rectified structures and saves 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 students' writing tends to manifest a presentation of thoughts. Inability to create or set up these thoughts is due to the absence of semantic and syntactic competence. Using Google can assist them to have more idea to write. It seems that they suffer from using fewer phrases, more incomplete sentences and primary syntactic structures, less subordinate clauses, less noun phrase modifiers, and omissions of feature phrases in writing. They face significant troubles when making several sentential errors because of their problems in getting access to learning syntactical structures. The researchers' observation in the current study suggest Google can be an effective instructional tool to enhance DHI self-confidence and independence.

Based on the findings of this study, in order to improve DHI writing performance, longitudinal and experimental research are needed to clearly and more evidentially demonstrate the impact of using technology on DHI learners. The essential factors in future studies are related to using technology to identify what kinds of tools can facilitate learning. Specifically, the following suggestions can be taken into account: 1) finding and correcting mistakes through the use of web search engines can be considered both an effective solution for common writing problems and a training tool for learners to

identify errors in their writing, 2) Google quotation mark search tool can help DHI writers detect unnatural and incorrect phrases quickly, future studies can evaluate the effect of frequent online corpus usage on ESL learners' writing skill, 3) working in an interactive context, SIWI for instance, which considers students' participation as an essential factor for language learning, will be a teaching enterprise for instructors, 4) using activities which cause the students to employ various language learning strategies and thereby enhance their interest in writing, will bring a sense of fulfillment to the teachers, and 5) integrating authentic writing materials and realistic writing tasks into the learning environment will lead to the learners' writing development.

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