



## **A Comparative Study of the Impact of Explicit Instruction, Input Enhancement, and Guided Discovery on Iranian EFL Learners' Passive Voice Production: A Computer-Assisted Language Learning Approach**

Sepideh Rafiei Sakhaei<sup>1</sup>, Biook Behnam<sup>2,\*</sup>, and Zohreh Seifoori<sup>3</sup>

<sup>1</sup> *Ph.D. Candidate in TEFL, Tabriz Branch, Islamic Azad University, Tabriz, Iran, ORCID: 0000-0002-6190-9467  
Email: rafieisakhaei.sepideh@gmail.com*

<sup>2</sup> *Corresponding Author: Associate Professor of TEFL, Department of English, Tabriz Branch, Islamic Azad University, Tabriz, Iran, ORCID: 0000-0002-8936-0701  
Email: behnam\_biook@yahoo.com*

<sup>3</sup> *Associate Professor of TEFL, Department of English, Science and Research Branch, Islamic Azad University, Tehran, Iran, ORCID: 0000-0002-4296-8226  
Email: Zseifoori2005@yahoo.com*

### **Abstract**

It is commonly agreed that grammar is so important that it should not be ignored. The English passive voice can be a challenging aspect of grammar learning for Iranian EFL learners. The aim of this study was to comparatively and empirically investigate the effect of the Input Enhancement Technique (IET), Guided Discovery Approach (GDA), and Explicit Instruction Method (EIM) on Iranian EFL learners' passive voice production. It sought to determine the individual effectiveness of these methods and identify the most efficient one. To this end, 70 Iranian EFL learners from the Payam Nour University of Tabriz were chosen and divided into three groups, including GDA (N = 22), IET (N = 25), and EIM (N = 23). The research data were obtained based on three validated, researcher-designed computerized activities. Pretest and posttest were used to elicit information on the learners' production of passive voice. The results of the data analysis revealed that both IET and GDA had significant effects on the production of passive voice. However, EIM did not significantly influence the production of passive voice. Meanwhile, GDA was found to be the most efficient teaching technique compared with the other methods. This study has some important implications for teachers, students, and syllabus designers.

*Keywords:* CALL, explicit instruction, guided discovery, input enhancement, passive voice production

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## **Introduction**

Attaining grammatical competence is a crucial aspect of communicative competence, and it is often prioritized in effective classroom practice (Yufrizal, 2017). Language teaching history is replete with arguments describing the pros and cons of grammar instruction (Zhang, 2009); however, an agreement is far from reach, and contradictory results have been obtained that require further investigation in this field. Whether to teach grammar explicitly or acquire it naturally has been a controversial issue in the realm of second language learning (Ellis, 2008).

Although the rise of the communicative approach deemphasized the minute presentation of rules of language usage, it has been observed later that only a small number of learners are capable of picking up accurate linguistic forms solely through exposure to the target language (Larsen-Freeman, 2014). Sheen (2007) argued that explicit teaching methods help learners analyze information through comprehension practice and might be more efficient than the models that entail producing language too early. Proponents of the traditional method of language teaching mainly utilize explicit grammar teaching; however, those who assume that covert grammar instruction suffices may use the implicit way.

Meanwhile, the emergence of Long's Focus on Form (FonF) in 1991, in response to the constraints of forms-focused and meaning-based styles, opened a new window into the realm of grammar instruction. Among different approaches to FonF instruction, one that drew researchers' attention is "Input Enhancement", which is described as learning resulting from providing learners with enriched or enhanced L2 input, including a target grammar structure (Hulstijn, 2003). The distinguishing characteristic of input enhancement is the noticing of input. Schmidt's (1994) "Noticing Hypothesis" asserts that directing L2 learners' attention to intended language forms can aid the students in recognizing any distinctions between the second language and their existing interlanguage.

In a similar vein, some people take the middle ground and are pleased with a balanced combination of implicit and explicit techniques. As Ellis (1995) believes, learners who are provided with a combination of explicit and implicit grammar teaching probably perform better. In this regard, the Guided Discovery Approach (GDA) is a solution for those who consider implicit versus explicit instruction as a continuum. Having roots in Bruner's (1961) discovery learning and constructivism, guided inquiry is a valuable but often overlooked option in educational discourse (Castillo, 2008). Guided discovery is an updated inductive strategy where language exposure comes first, then the inference is used, and rules are explicitly practiced at the end (Saumell, 2012).

Besides, recent technological advancements have encouraged some researchers to study the influence of using computer-assisted language learning (CALL) programs in different aspects of foreign and second language teaching and learning (Pawlak & Kruk, 2022). The implementation of the CALL has been found to raise students' motivation, enhance learning efficiency, foster innovation, and alter traditional student-teacher roles (Lim & Aryadoust, 2022). Students are no longer passive receivers of knowledge from an expert but rather active participants

interacting with a facilitator or guide. The frequent development of CALL technologies also affects the area of grammar teaching (Bahari & Gholami, 2022). Grammar is often perceived as the most tedious aspect of language learning, particularly among students who have been exposed to conventional teaching methods (Sakhaei et al., 2023). Accurately, the old chalk-and-board approach, which is extensively used in Iranian schools and colleges, is no longer the only way of teaching grammar, nor is it favored by language learners. Moreover, teachers have to constantly evaluate the educational environment to create learning innovations that are diverse, effective, and well-suited to the students' needs and interests (Nazli & Yahya, 2023). Thus, enabling CALL in language classrooms is one possible option that could help them reach their pedagogical goals (Ebadijalal & Moradkhani, 2023).

In this study, the English passive voice was chosen to be investigated under different treatments since the passive structure in Persian is widely disputed among scholars and there is no consensus around its presence in Persian yet (Abdollahi-Guilani & Tan, 2016; Hadian et al., 2013). In addition, the materials given to EFL students in the classroom context do not typically include this structure. One of the principles of VanPatten's (2004) "input processing model", the first noun principle, is a substantial additional justification for selecting the passive voice. According to this theory, most second language learners tend to process the first noun or pronoun in a phrase as the agent, regardless of the student's mother tongue. As a consequence, EFL students would have difficulty understanding the English passive voice, wherever the initial noun or pronoun must be processed as the patient (Qin, 2008). Further, learning the accurate form of the verb tenses is troublesome for EFL learners, specifically when there is no correspondence between the tenses in their native and foreign languages (Nourdad & Tim Aghayi, 2014). In this regard, it could be very demanding for Iranian English language teachers to investigate various techniques that can simplify the instruction of passive voice. Therefore, given the numerous benefits that technology can offer to the learning environment and in light of the ongoing search for an optimal method of grammar instruction in the continuum of explicit versus implicit methods, this study seeks to determine the effect of different CALL-based instructional instruments, including explicit instruction method (EIM), input enhancement technique (IET), and guided discovery approach (GDA), on the production of passive voice.

## **Literature Review**

### **The Historical Background of the Presentation, Practice, and Production (PPP) Model**

Throughout the period of the shift between communicative language teaching (CLT) and situational language teaching (SLT) in England, the three-stage model of PPP was devised by Byrne (1976). According to Anderson (2016), contrary to views that assume PPP originates from audiolingual (Harmer, 2007) or behaviorist (Willis, 1994) methods of language teaching, this is not the case. He demonstrates this fact about the last stage of PPP and asserts that it is in harmony with the "weak version" of CLT due to the freedom it allows in the production stage (Rixon & Smith, 2012).

Although the PPP model has provoked many criticisms (Tomlinson et al., 2001), it continues in its revised form to be used to date (Mamatkulova, 2023). Evans (1999) argued that PPP has developed over time, absorbing the most attractive components of other methods and integrating them into its original form. PPP can be regarded as an advantageous model because it conforms to the simple psychological theory that practice makes perfect (Carless, 2009). In short, the three Ps approach is fit for beginning teachers and low-achieving students (Maftoon & Sarem, 2015). It permits the instructor to control the pace and content of the lesson (Thornbury, 1999). It provides the novice teacher with a complete set of successive stages to be followed in the class (Richards & Rodgers, 2001).

### **Textual Input Enhancement**

Different variables affect SLA. An external factor crucial to language acquisition is the input that language learners receive (Bahrani & Nekoueizadeh, 2014). The role and significance of language input are supported by several language learning theories such as interactionism, mentalism, and behaviorism (Ellis, 2008). It can be argued that SLA is not achieved in the absence of target language input (Mackey & Gass, 2015). "Input enhancement", according to Smith (1993), is defined as any attempt to direct students' attention to the grammatical structures while leading them to consider their meaning. According to Schmidt (2012), people understand the things that they attend to and do not get much information about the things they do not pay attention to.

Various techniques like typographical modifications via underlining, boldfacing, italicizing, or capitalizing are utilized to enhance input or add to the saliency of certain target structures (Nahavandi & Mukundan, 2013). The aim is to enhance the target structures' saliency in the source material and increase the possibility of noticing the forms simultaneously (Luquin & Garciamayo, 2023).

### **Guided Discovery Approach**

Guided discovery is considered a constructivist instructional model that incorporates principles of cognitive pedagogy and a discovery learning approach (Sulistiani & Agustini, 2022). Amid the two approaches of reception / expository learning and discovery instruction lies "guided discovery", which selects the best of each (Henson, 1980). In this model, the instructor primarily makes illustrative materials available, and then key questions are posed to stimulate critical thinking and help learners draw conclusions using scientific processes (Nwagbo, 1999). De Jong (2021) regarded guided discovery as a cognitive procedure. He asserted that, in general, effective discovery learning is associated with reasoning from hypotheses, employing a planned and systematic discovery process, and using good-quality explorations for investigation. Similarly, Westwood (2008) supposed that guided discovery is mostly considered an inspiring technique that is appreciated by students. This approach offers students the chance to make creative and appropriate decisions about the objective of the exploration (Zahara, 2017). Convergent thinking is the hallmark of guided discovery (Abdulfatai, 2018).

## **Empirical Studies**

Various studies compared Explicit and implicit methods of instruction in terms of grammar success (Andrews, 2007; Bakhshandeh & Jafari, 2018; Darakhani & Rajabi, 2022; Lynch, 2005; Nazari, 2013; Safdari, 2019). For example, Bakhshandeh and Jafari (2018) studied the effects of input enhancement and explicit instruction on improving Iranian EFL learners' explicit knowledge of simple past and simple present passive voice. The results showed that explicit training is superior for developing passive voice explicit knowledge. Also, in a recent study, Darakhani and Rajabi (2022) aimed to explore the relationship between GDA and the speaking confidence of Iranian English language learners. The study concluded that the guided discovery led to a more realistic classroom with an atmosphere like everyday life.

The related literature review shows contradictory results concerning the influence of input enhancement on grammar acquisition. While several studies have indicated the effectiveness of this method (Abadikhah & Shahriyarpour, 2012; Kalanzadeh et al., 2018; Mohamadian & Shabestari, 2017; Nourdad & Tim Aghayi, 2014), some others have not found it has any substantial effect on the development of grammatical structures (Al-Hejin, 2004; Basturkmen, 2018; Han et al., 2008; Izumi, 2002; Wong, 2003). In addition, the guided discovery has drawn the attention of scholars and has been the subject of recent investigations (Alcaraz & Isabel, 2018; Alfieri et al., 2011; Pratiwil et al., 2021; Simamora et al., 2019; Sulistiani & Agustini, 2022).

Moreover, considering the implementation of computerized systems, most empirical studies of CALL have been limited to presenting computer-aided teaching methods to provide comprehensible input and are too narrow in scope (Bahari & Gholami, 2022). Meanwhile, the effect of CALL-based methods on the grammar acquisition of EFL students has not been addressed comprehensively (Weng & Chiu, 2023).

The studies mentioned are noteworthy as a foundation for upcoming research that compares guided discovery learning with explicit and implicit language teaching techniques. However, our research provides further contributions to the literature. First, despite the abundance of comparative research on CALL in other fields of study like reading and the increasing body of research on methods of grammar teaching, the literature review reveals that only a limited number of studies have explored the integration of passive voice as a demanding grammatical structure into computer-assisted grammar lessons using different teaching techniques.

Second, the present study investigates the effect of different techniques on the production aspect of grammar knowledge; in most previous research, L2 learning is assessed in general terms without considering the fact that, according to the "Output Hypothesis", for successful language learning to take place, it is necessary to move from a comprehension only process that is confined to "semantic processing" to a language production that entails more "syntactic processing".

Third, to the best of our knowledge, to date, few studies have focused on modern approaches to EFL grammar instruction such as input enhancement or guided discovery as opposed to explicit instruction, and the cumulative effect of these strategies on the grammatical proficiency of language learners has not been investigated in the Iranian context.

Therefore, as a novel scientific experiment, the aim of the present study was to empirically and comparatively investigate the effect of the Input Enhancement Technique (IET), Guided Discovery Approach (GDA), and Explicit Instruction Method (EIM) on Iranian EFL learners' production of passive voice through computerized techniques. It sought to determine the individual effectiveness of these methods and identify the most efficient one.

To accomplish the goals of this study, the following research questions were formulated:

1. To what extent does the guided discovery approach affect Iranian EFL learners' production of passive voice?
2. To what extent does the input enhancement technique affect Iranian EFL learners' production of passive voice?
3. To what extent does the explicit instruction method affect Iranian EFL learners' production of passive voice?
4. Is there a significant difference among the groups receiving explicit instruction method, input enhancement technique, and guided discovery approach on the production of English passive voice?

## **Methodology**

### **Design of the Study**

The pretest-posttest quasi-experimental design was used in this study. Although the researcher chose participants from intact classes, she randomly assigned them to distinct groups.

### **Participants**

The initial pool of participants in this study was composed of 100 Iranian EFL learners majoring in English Language Translation and English Language Literature who were chosen on the basis of the convenience sampling method. The participants were both female and male students, with an age range of 19 to 38 years old. They were bilingual EFL learners, native speakers of Turkish whose second language was Persian. They attended the English Grammar Course in the academic year 2021-2022, at Payam Nour University of Tabriz.

The Preliminary English Test (PET) was used to confirm the homogeneity of the students. Based on the results of this test, 70 intermediate EFL learners whose scores fell one standard deviation below and above the mean were chosen, and the outliers were excluded from extra analyses. Since it was practically impossible to disrupt the schedules of the university, three classes were randomly assigned to

GDA (N = 22; 4 males and 18 females; mean age = 24 years old), IET (N = 25; 11 males and 14 females; mean age = 27 years old), and EIM (N = 23; 7 males and 16 females; mean age = 28 years old), respectively. An overview of the information on the study participants is presented in Table 1.

**Table 1**

*Demographic Information About Participants*

Participants	Sex		Age (mean)	Experience of learning (years)	Total
	Male	Female			
<b>IET</b>	11	14	27	4	25
<b>GDA</b>	4	18	24	3	22
<b>EIM</b>	7	16	28	3	23
<b>Total</b>	22	48			70

**Instruments**

*PET*

The reading, writing, and listening sections of PET were administered as a standardized test to ensure students' homogeneity in language skills. The speaking section was eliminated because of practical problems. There were 68 questions that students answered in 125 minutes.

*Pretest and Posttest*

After choosing the participants, their previous knowledge of the passive voice in English was assessed through a validated teacher-made pretest prepared to test the participants' ability to use the target structure through picture description and fill-in-the-blanks. The demographic information on the content of the pretest and posttest is tabulated in Table 2.

**Table 2**

*Content and Structure of the Pretest and Posttest*

Focus	Item type	Number of items
<b>Production</b>	Picture description	20
	Fill in the blank	20

As a last phase of the treatment, the posttest was administered to identify the differences in the three groups' production of the target structure. The posttest was similar to the pretest in terms of format and difficulty level. The content validity of both tests was approved by three experienced EFL teachers and the reliability of them was checked through Cronbach's Alpha.

*Computerized Program for EIM Group*

The study data were collected through a collaboratively created computerized grammar training program designed by software programmers and

researchers to teach passive voice. The program's content has been thoroughly reviewed and validated by a team of experts in TEFL and curriculum design.

**Table 3**

*Three Stages of EIM*

<b>First stage</b>	Presenting the form	<div data-bbox="631 430 946 487" style="border: 1px solid black; padding: 2px;">English Explanation</div> <div data-bbox="631 496 946 554" style="border: 1px solid black; padding: 2px;">Persian Explanation</div> <div data-bbox="631 563 946 611" style="border: 1px solid black; padding: 2px;">Examples within a text</div>
<b>Second stage</b>	Practicing the form	<div data-bbox="631 639 946 687" style="border: 1px solid black; padding: 2px;">Gap fill exercise</div> <div data-bbox="631 696 946 744" style="border: 1px solid black; padding: 2px;">Substitution drill</div> <div data-bbox="631 753 946 801" style="border: 1px solid black; padding: 2px;">Sentence transformation</div> <div data-bbox="631 811 946 877" style="border: 1px solid black; padding: 2px;">Reordering sentence</div>
<b>Third stage</b>	producing the form	<div data-bbox="631 906 946 953" style="border: 1px solid black; padding: 2px;">Give your idea</div> <div data-bbox="631 963 946 1011" style="border: 1px solid black; padding: 2px;">Discuss with a peer</div> <div data-bbox="631 1020 946 1077" style="border: 1px solid black; padding: 2px;">Involve your teacher</div>

The explicit Instruction Method was taught using the PPP model. The treatment involved a three-steps computerized program that carried out the presentation, practice, and production steps with the participation of the teacher and students. In the first stage, which primarily focused on the presentation step, all the rules of a specific passive voice were explained in both Persian and English. Just as stated by Nassaji and Fotos (2011), in presenting a form stage, a new grammatical rule is introduced through a story, a dialogue, or a text that contains the structure. Moreover, some examples of the rule were given to clarify the structure. The second part of the treatment focused on the practice aspect of the model, where learners were faced with different types of drills and exercises such as substitution drills, filling-the-gap exercises, reordering sentences, matching a picture to a sentence, or sentence transformations. At this stage, the focus was on grammar structure, and learners were actively controlled so that the new structure of passive voice was precisely practiced. In the final stage, learners had the opportunity to chat and generate ideas while discussing a topic. In other words, students communicated about a given topic using the chat system of the program. The last stage involved both cooperation and collaboration between students and the teacher. The blueprint of the three stages of the program is given in Table 3.



### Computerized Program for IET Group

The computerized program, which was mainly designed and prepared for the IET group, consisted of four stages. The first stage focused on presenting the new form within a text that is optionally underlined, boldfaced, italicized, capitalized, and color-coded. The students were free to choose the type of enhanced input to get familiar with the new passive voice. The second stage provided an opportunity for the students to discuss the new issues that had already been emphasized within the text. This stage was also accompanied by teachers' monitoring of students' negotiations of metalanguage. This research group also faced a third stage devised with different form-focused tasks. Last but not least was the production stage, where the students received feedback on their problems and errors (See Table 4 below).

**Table 4**

*Four Stages of IET*

<b>First stage</b>	Presenting a new form within modified input	Underlined examples in a text
		Boldfaced examples in a text
		Color-coded examples in a text
		Capitalized examples in a text
<b>Second stage</b>	Negotiations of metalanguage	Teachers' monitoring
		Students' discussion
<b>Third stage</b>	Practicing the form	Contextualized tasks
		Cloze tasks
		Editing tasks
<b>Fourth stage</b>	Producing the form	Give your idea
		Discuss with a peer
		Receive teacher feedback

### **Computerized Program for GDA Group**

The treatment that was utilized for this group included four stages. As a first stage, the GDA was operationalized through a brief context-setting activity in the form of a short reading text of an appropriate level rich with examples of the target form. It is recommended to choose a text containing a mix of plural and singular subjects and / or a variety of tenses (Caprario, 2013). In the second stage, some questions were observed; notably, the questions focused on both form and meaning. The aim was to assist learners in discovering the new structure themselves. The explanation of the new structure and its examples were given in the third stage. Finally, the last stage was designed based on a communicative purpose, where the participants were required to produce the new structure with other members of the group. This program was based on a grammar worksheet prepared to help learners achieve the grammatical objective through the guided discovery of the meaning and form (adopted from Caprario, 2013). To be compatible with the Think Pair Share model of Caprario (2013) at all stages of the GDA model, before going to the next section, students were asked to stop to check their answers in a small group or with a partner using the chat system of the program. In addition, the program had the capability of presenting correct answers to the participants by clicking on the view answers button. The blueprint of the program is presented in Table 5.

**Table 5**

*Four Stages of GDA*

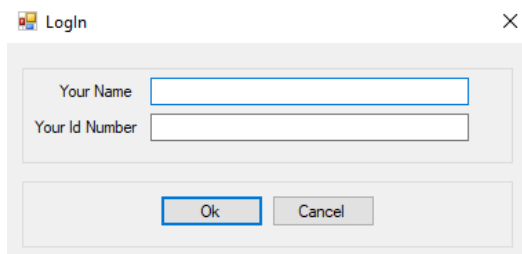
<b>First stage</b>	Exposure to the new rule <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 80%;">                     Reading passages containing examples of target structure                 </div>
<b>Second stage</b>	Discovery of target structure <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 60%;">                     Form-focused tasks                 </div> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 60%;">                     Meaning-focused tasks                 </div>
<b>Third stage</b>	Explaining the form <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 60%;">                     Explanation                 </div> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 60%;">                     Examples                 </div>
<b>Fourth stage</b>	Producing the form <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 60%;">                     Dealing with tasks related to passive voice                 </div> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 60%;">                     Discuss with a peer                 </div> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 60%;">                     Discuss with the teacher                 </div>

## Procedure

The data collection procedure of this study began with the introduction of the methods and procedures for performing the activities in the system. The instructor was responsible for collecting the data during the 12 treatment sessions held for passive voice training at three tense levels as part of the weekly teaching syllabus. Every session of instruction was held in the computer lab of the Payam Nour University of Tabriz, which was equipped with so many computers. The treatment sessions were conducted separately for each group. Learners were taught to work with the program and were reminded that the study results would be part of their midterm examination. In addition, the learners were given a special user name to remain anonymous in the system. For instance, one lesson from the GDA session is described in this section. The participants started the lesson by logging in to the program. See Figure 1 below:

**Figure 1**

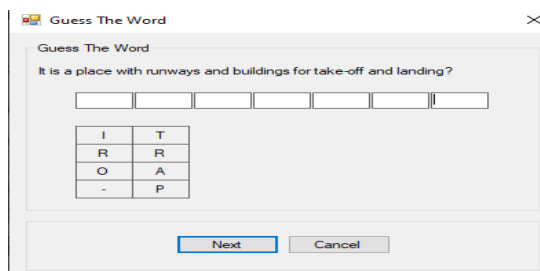
*The Lead-in Section of the GDA Program*



To generate interest in the topic and context and activate schemata, the program was designed to elicit the term airport using jumbled letters. This was done to encourage participants to activate their knowledge of the context (Figure 2).

**Figure 2**

*Schema Building in the GDA Program*

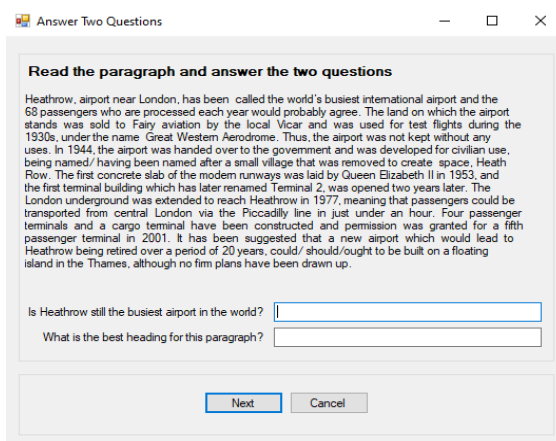


Then the exposure stage of the lesson started. To establish a guided discovery lesson, the passive voice was introduced through a reading passage that contained several instances of the target form. Indeed, the participants were required

to read for the gist and answer the next two questions. Figure 3 shows how the participants had to deal with the reading passage to be guided to passive voice.

**Figure 3**

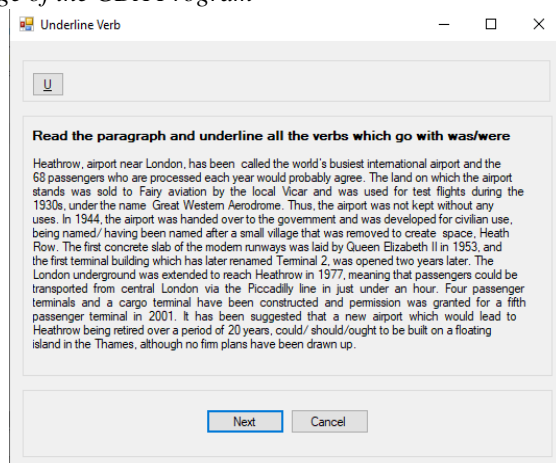
*The First Stage of the GDA Program*



Next, to highlight the target structure, that is, simple past passive voice, the program was designed to elicit all the verbs with *was* or *were*. This was purposefully done to encourage learners to notice the target structure and assist them in discovering the new structure (See Figure 4).

**Figure 4**

*The Second Stage of the GDA Program*



Also, to clarify the target language meaning and highlight the target form, some comprehension check questions were asked. At this stage, the students were

asked to answer questions about the sentences taken from the passage. This stage of GDA is demonstrated in Figure 5. The main reason for designing this meaning-focused activity was to highlight the learners' need for cooperation with their teacher and peers. At this stage, through their discussions, students may support one another in critical thinking and problem-solving, along with lexical choices and form noticing (Caprario, 2013).

**Figure 5**

*The Meaning-Focused Activity Related to the Second Stage of the GDA Program*

Look at the sentences and answer the questions	
The land on which the airport stands <b>was sold</b> to Fairy aviation by the local Vicar and <b>was used</b> for test flights during the 1930s, under the name Great Western Aerodrome.	Who sold the land? Is the seller important? Is the land important? Is it past or present? Who used the land for test flights? Are the users important? Which one is important? The action or the doer?
In 1944, the airport <b>was handed</b> over to the government.	Who handed over the airport to the government? Are the people who handed it over important? What is important? Action or giver?
... after a small village that <b>was removed</b> to create space	Who removed the village? Is it important to know who removed the village? What is important?
The London underground <b>was extended</b> to reach Heathrow in 1977	Is the London underground new information? Who extended the London underground? Do we need to know who extended the London underground? Is it important?
... permission <b>was granted</b> for a fifth passenger terminal in 2001...	Who gave permission? Which one is important? Permission or the person who gives permission? Is it present or past?

Next Cancel View Answers

In the next stage, to consolidate the preceding sections into a formula and enhance the students' consciousness of the meaning and form of the target structure, an explanation of the form was delivered through a gap-fill exercise (See Figure 6).

**Figure 6**

*The Third Stage of the GDA Program*

**Fill the gaps with the words given below:**

A passive [ ] is a type of a clause or sentence in which an [ ] (through verb), or an [ ] of a sentence, is emphasized rather than its [ ]. Simply the [ ] receives the action of the verb. The emphasis or focus is on the action while the subject is not [ ] or less important.

Object    Action    Subject ?    Voice    Known

**Complete the pattern with the words given.**

The [ ] (now the subject ) + was/were + [ ] + [ ] + [ ]  
+ object (noun which was [ ] before)

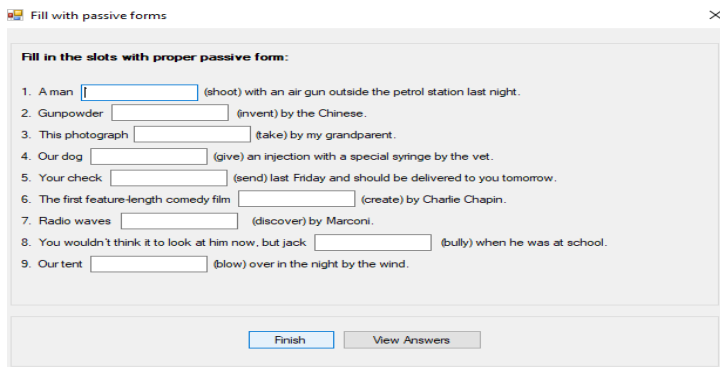
By/with    Subject    Object    Past Participle (verb 3)

Next Cancel View Answers

Finally, to provide controlled practice of the target structure, the last stage of the program provided the participants with some tasks related to passive voice production (See Figure 7).

**Figure 7**

*The Fourth Stage of the GDA Program*



**Data Analysis**

A paired sample t-test was performed to answer research questions 1 to 3. To answer the last research question based on normality assumptions, the researcher used an ANOVA. Moreover, to determine how much the groups under different teaching instructions were different from each other, post-hoc analysis was utilized. All analyses were conducted using SPSS 26.

**Results**

To address research questions 1 to 3, which are concerned with the extent of effectiveness of GDA, IET, and EIM instructions in the production of passive voice, the mean scores of the pretests and posttests are compared. Hence, in this section, first, the descriptive statistics of the three groups in the pretests and the posttests are presented. Then, to answer the fourth research question, the most efficient teaching technique for improving the production of the passive voice is determined using inferential statistics.

**Table 6**

*Descriptive Statistics of GDA, IET, and EIM Groups in the Pretest and the Posttest*

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>SD</b>
<b>GDA pretest</b>	22	6.00	21.00	13.1818	3.88693
<b>GDA posttest</b>	22	14.00	34.00	25.5909	5.61171
<b>IET pretest</b>	25	3.00	29.00	11.6400	5.14684
<b>IET posttest</b>	25	10.00	33.00	18.8000	4.45346
<b>EIM pretest</b>	23	6.00	20.00	12.5217	4.33663
<b>EIM posttest</b>	23	7.00	24.00	13.6522	4.83932

As is shown in Table 6, the means of the three groups in the pretests are similar, showing that the students in the three groups were equivalent before the study. However, a one-way ANOVA was used to identify the homogeneity of the participants in the pretest. The preliminary assumptions of the normality of the data distribution and the homogeneity of the variances were checked before conducting ANOVA (see Appendix).

The fact that the mean scores in three experimental groups went up from the pretests to the posttests showed that the treatments in these groups worked to improve the use of the passive voice. Hence, the paired sample t-test was used for comparing the means of the pretests and the posttests and testing the statistical differences between them.

A one-way ANOVA was used to determine the lack of pre-existing differences between the means of the GDA, IET, and EIM groups in terms of the production of the passive voice in the pretest (Table 7).

**Table 7**

*ANOVA Test for the Pretest Groups*

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
<b>Between Groups</b>	28.214	2	14.107	.692	.504
<b>Within Groups</b>	1366.772	67	20.400		
<b>Total</b>	1394.986	69			

Because the p-values of the ANOVA test are higher than 0.05 ( $p > 0.05$ ), the means of the three groups of GDA, IET, and EIM are not significantly different. In other words, the participants were homogeneous in terms of their knowledge of the production of the passive voice. This shows that the groups were comparable before the treatment.

**Table 8**

*Paired Sample T-Test for Comparing Pretest and Posttest Scores of Production of Passive Voice in the Three Groups*

<b>Pairs</b>	<b>Std. Error Mean</b>	<b>Paired Differences</b>		<b>t</b>	<b>df</b>	<b>Sig. (2-tailed)</b>
		<b>95% Confidence Interval of the Difference</b>				
		<b>Lower</b>	<b>Upper</b>			
<b>GDA pretest - GDA posttest</b>	1.125	-14.74986	-10.06833	-11.025	21	.000
<b>IET pretest - IET posttest</b>	.5963	-8.39075	-5.92925	-12.007	24	.000
<b>EIM pretest - EIM posttest</b>	.8875	-2.97112	.71025	-1.274	22	.216

To determine the effectiveness of GDA, IET, and EIM instruction in terms of the production of passive voice, a paired sample t-test was performed to identify

the mean differences between the pretests and the posttests. The results of this test are presented in Table 8.

As shown in Table 8, there were significant differences between the pretest and posttest scores of the participants in the GDA and IET groups ( $p < 0.05$ ). This shows that GDA and IET instructions have significantly improved the production ability of the passive voice of Iranian EFL learners. With these explanations, the answers to the first and second research questions regarding the effectiveness of GDA and IET in improving the production knowledge of passive voice become clear.

Because the p-value of the EIM group between the pretest and the posttest was higher than 0.05, the EIM instruction did not have any significant effect on improving the production of the passive voice by Iranian EFL learners at a 95% confidence level. By doing so, the answer to the third research question becomes clear.

To address the fourth research question, a one-way ANOVA was used to determine the significant differences between the means of the three groups in the posttest.

**Table 9**

*ANOVA Results for the Posttest*

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	1610.336	2	805.168	32.645	.000
<b>Within Groups</b>	1652.536	67	24.665		
<b>Total</b>	3262.871	69			

The ANOVA test in Table 9 indicated that there were significant differences in the production of passive voice among the means of the three groups at a 95% confidence level. In other words, the effectiveness of the three groups in improving the production of the passive voice was completely different. A Tukey post-hoc test was conducted to do a pairwise comparison among the means of the GDA, IET, and EIM groups (Table 10).

**Table 10**

*Tukey Post-Hoc Test Results for GDA, IET, and EIM Groups*

(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
<b>1.00</b>	2.00	6.79091*	1.45180	.000	3.3111	10.2707
	3.00	11.93874*	1.48105	.000	8.3888	15.4886
<b>2.00</b>	1.00	-6.79091*	1.45180	.000	-10.2707	-3.3111
	3.00	5.14783*	1.43491	.002	1.7085	8.5871
<b>3.00</b>	1.00	-11.93874*	1.48105	.000	-15.4886	-8.3888
	2.00	-5.14783*	1.43491	.002	-8.5871	-1.7085



As the p-values for Tukey post-hoc were lower than 0.05, the pair of means of the three groups were significantly different. GDA was significantly effective in improving Iranian intermediate EFL learners' production of the passive voice. Meanwhile, the IET group performed better than EIM. Because the means of the GDA group in Table 6 were higher than those of the other groups, GDA instruction was the most efficient teaching technique when compared with the other methods. Moreover, the means of the EIM group were the lowest among the three groups (Table 6). This shows that the EIM group was the least effective in improving knowledge of the production of the passive voice.

### **Discussion**

According to the questions raised in this study, the results showed that for the selected grammar point, students who were taught under GDA conditions generally performed better than those who were exposed to the implicit representation of the grammar structure and the explicit teaching method. The findings of the first and second research questions indicated that both IET and GDA had significant effects on students' production of passive voice. Findings from the input enhancement technique contribute to Schmidt's (1994) theory of the "Noticing Hypothesis". In the present study, textual enhancement promoted the students' noticing of the form and improved their target structure use. Accordingly, as Schmidt states, noticing an item is an essential condition for the acquisition of that item. The findings of this part of the study are in line with those of (Abadikhah & Shahriyarpour, 2012; Kalanzadeh et al., 2018; Nourdad & Tim Aghayi, 2014). Conversely, the findings were in contrast with the studies that do not support input enhancement as an effective technique in developing learners' acquisition of English passive structure (Al-Hejin, 2004; Basturkmen, 2018; Han et al., 2008; Izumi, 2002; Wong, 2003).

The results of the data analysis on the third research question indicated that the production of passive voice in EIM was not significantly different on the pretest and the posttest. This part of the results was in contrast with studies such as Lynch (2005), Andrews (2007), and Nazari (2013). Since both IET and GDA improved substantially more than EIM, the outcome favors the use of more implicit methods that are closely associated with Krashen's (1982) "Natural Approach" theory. It is founded on the notion of incorporating naturalistic language acquisition into the classroom. Also, the fact that instructing target language structures in a meaningful way was more efficient than the presentation of isolated linguistic structures puts the "FonF" instructional techniques at an advantage over the "FonFs" (Long, 1991).

A one-way ANOVA was conducted to answer the last research question, and the results indicated that the production of passive voice was significantly different as a result of different instructional techniques. The findings showed that GDA could lead to a better and more efficient contribution compared to two other instructional techniques.

There might be several reasons for the superior performance of the learners in the GDA group. Since the students participating in this study had been trained

using traditional teaching methods for years, presenting grammar structures through GDA as a new method, implemented using computer programs, seemed very attractive to them. Therefore, the learners performed all the steps presented in this method with great interest and precision. Another reason that can explain the outperformance of the GDA group is the grammatical structure chosen for this study. Understanding the passive voice of L2 verb tenses in English is regarded as one of the most problematic grammatical challenges for EFL students. As Andrews (2007) displayed in his study, a simpler grammatical structure could result in a different outcome. Also, the success of this method can be attributed to the optimal combination of both explicit and implicit teaching methods at different stages of its implementation. In addition, this method can lead to an active and deeper understanding of educational materials by taking advantage of Bruner's (1961) "Discovery Learning Method". The effective support of the teacher through the guidance component might be another important issue that can be explained according to Vygotsky's (1978) "Scaffolding Theory". In cases of learning problems, scaffolding can help students learn material that they would not have been able to process on their own. As a result, GDA can be considered a complete educational package that meets students' expectations of a teaching method and responds appropriately to their educational needs. Regarding the findings of the study that investigated the effectiveness of guided discovery learning, the results are in line with (Alcaraz & Isabel, 2018; Alfieri et al., 2011; Pratiwil et al., 2021; Simamora et al., 2019).

The results of this study showed that CALL-based instructional methods may provide indirect support for an increase in learner language production due to the advantages attested to their use. The software program could have a positive effect on students' motivation through the provision of increased practice opportunities and immediate and non-judgmental feedback (Ebadijalal & Moradkhani, 2023). The present study found empirical support for those who attempted to indicate that technology-enhanced instruction could be utilized at the service of teaching language skills and sub-skills like grammar (Bahari & Gholami, 2022; Lim & Aryadoust, 2022; Nazli & Yahya, 2023; Weng & Chiu, 2023).

Regarding the various advantages attributed to GDM and CALL, one can infer that computer-assisted guided discovery can be a proper approach to all scientific inquiries (Lim & Aryadoust, 2022; Pratiwil et al., 2021). A combination of the characteristics of the discovery learning method and technology-based instruction has made it a preferred option in the fields of pragmatics, psycholinguistics, and sociolinguistics (Pawlak & Kruk, 2022). However, the idea is not exclusively confined to the realm of language instruction. Such a collective method is applicable to any field of study that requires scientific discovery to be presented in an engaging manner, like mathematics, chemistry, and biology, to name a few (Sulistiani & Agustini, 2022).

### **Conclusion**

As syntactic awareness is an important aspect of English language teaching, how to teach grammar successfully is considered an essential issue. There may

never be a clear answer to the best approach to education, but any effort to address this issue should be valued as it can lead to improvements in the overall quality of education. In this study, the production of passive voice was explored through CALL-based grammar teaching methods. IET and GDA were identified as useful techniques for creating valuable contexts for improving the production of passive voice. Nevertheless, like many other teaching techniques, EIM presented some negative results when learners were to practice the production of passive voice. Also, GDA was found to be the most efficient teaching technique when compared to two other methods.

The study results have some pedagogical implications that can improve teaching grammar in an Iranian EFL context. First, teachers may attend teacher training courses to learn how to use guided discovery to teach grammar. Second, coursebook writers are required to create some instructional materials that strengthen analytical thinking and problem-solving skills. Third, EFL educators and students must enhance their technology skills as the first step toward implementing CALL-based practices. Fourth, syllabus designers are advised to integrate new technologies into the syllabus to enhance teaching and learning outcomes. Finally, because of the importance of CALL, the Ministry of Education in Iran has to equip schools with computer laboratories so that students and teachers can benefit from the supplementary resources that technology provides.

The present research, like any applied linguistics study, suffered a number of limitations and delimitations. Firstly, for the restricting rules of the target university, the number of sessions allocated to data collection was limited. Secondly, not having access to many university students at the intermediate level, the researcher observed the classes which were accessible. Hence, interested researchers are recommended to opt for learners at a random sampling base and provide them with an adequate number of treatment sessions. Also, a main delimitation of this study was the focus on the three types of grammar teaching techniques while there were a large number of techniques that could be selected. Therefore, it is possible to triangulate more techniques to generate more fruitful results.

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### Appendix

#### Results Related to Assumption Testing

**Table A1:** Kolmogorov-Smirnov Test for the Normality of the Data Distribution in the Pretests and the Posttests

	Statistic	df	Sig.
GDA pretest	.155	22	.183
GDA posttest	.116	22	.200
IET pretest	.173	22	.084
IET posttest	.161	22	.143
EIM pretest	.119	22	.200
EIM posttest	.122	22	.200

**Table A2:** Levene's Test for Identifying the Homogeneity of the Variances in the Pretests and the Posttests

	Levene Statistic	df1	df2	Sig.
Pre	.484	2	67	.618
Post	1.406	2	67	.252

### Authors' Biographies



**Sepideh Rafiei Sakhaei** is a Ph.D. candidate in TEFL at the Islamic Azad University of Tabriz, Iran. She has an M.A. in TEFL from the same university. She has a B.A. in English Language and Literature from Tabriz University, Iran. Her research interests include Grammatical Development in L2, Teaching and Learning L2 Skills, Critical Discourse Analysis, and Sociolinguistics.



**Biook Behnam** is an Associate Professor of Applied Linguistics at the Islamic Azad University of Tabriz, Iran. He has widely presented papers at national and international conferences in North America, Australia, Europe, China, India, and the South East. He has acted, for around ten years, as the Editor-in-Chief of the *Journal of Applied Linguistics* published by Tabriz IAU, and is on the editorial board of some national and international academic journals



**Zohreh Seifoori** is an Associate Professor of TEFL at the Islamic Azad University, Science and Research Campus, where she is a researcher, educator, and teacher trainer. She has published research articles in renowned national and international journals and her research interests include Teacher Education, Learner Autonomy, and Teaching Methodology.